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A Study of West Virginia P-12 Teachers' Use of the Internet as a Professional and Instructional Tool

Sandra Lee Orr

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**A STUDY OF WEST VIRGINIA P-12 TEACHERS' USE OF THE
INTERNET AS A PROFESSIONAL AND INSTRUCTIONAL TOOL**

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Dissertation submitted to the Faculty of the
Marshall University Graduate College
in partial fulfillment of the
requirements for the degree of

Doctor of Education
in
Curriculum and Instruction

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Huntington, West Virginia, 2006

Keywords: Research, educational technology, Internet, computer uses in education,
teachers

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ABSTRACT

A Study of West Virginia P-12 Teachers' Use of the Internet as a Professional and Instructional Tool

This study examines West Virginia P-12 teachers' use of the Internet as a professional and instructional tool. Quantitative and qualitative methods were used to gather descriptive data. Based on an extensive review of the literature, the researcher developed survey included 30 questions on the use of the Internet by teachers as a professional tool and by their students as an instructional tool. Two hundred forty-two West Virginia P-12 public school teachers participated in the study with fourteen participating in interviews. Interviews provided anecdotal information of teachers' experiences in finding, creating, and using the Internet for professional and instructional activities. Findings based on survey results are presented using the support of qualitative feedback from interviews. This study found respondents' most common use of the Internet as a professional tool was to find supplemental information for lessons and as an instructional tool was to have their students find information and/or resources. When comparing the 30 professional and instructional use questions to the demographic information, three areas that showed significant differences were participation in West Virginia Internet initiatives, the participant's identification of the greatest barrier to using the Internet, and the school's percentage of students receiving free or reduced lunch. No significant differences between the professional and instructional questions and age of respondents, years of teaching experience, and how the participants obtained their Internet knowledge were found.

DEDICATION

This dissertation is dedicated to my loving husband, Gary, who is my greatest supporter. Thank you Gary for staying home on weekends with me while I studied, for cooking meals while I was in class, for reading and reading my papers, for encouraging me when I wanted to stop, and most of all for loving me.

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A STUDY OF WEST VIRGINIA P-12 TEACHERS' USE OF THE INTERNET AS A PROFESSIONAL AND INSTRUCTIONAL TOOL

CHAPTER ONE: INTRODUCTION

The Internet, a growing and changing technology, reflects our ever evolving world (Simons, 2002), and is radically redefining the role of mass communication and how information is obtained and used (Provenzo, 2002). The Internet touches all facets of the world and has been hailed as an innovation with unprecedented potential for the improvement of teaching and of student achievement (Gibson & Oberg, 2004). With the hope of improving education, the United States has invested over \$40 billion to bring computers, educational software, and the Internet into the American classroom since 1990 (Dickard, 2003).

The U. S. and West Virginia Departments of Education, as well as international and national education organizations, have recommended more Internet integration. However, educators, to a great extent, have failed to bring the Internet into their classrooms (Gibson & Oberg, 2004) and have therefore not realized the promise of Internet technology in education. This promise with its endless possibilities for enriching the learning experience is frequently unrealized because adequate training in its use is not provided (U. S. Department of Education, 2005). In one of his final letters to Congress, U. S. Secretary of Education Rod Paige indicated that in the past, schools have attempted to integrate computer technology into the curriculum without changing instructional methods, thereby producing only a marginal increase in student achievement as a consequence of computer technology (U.S. Department of Education).

On Friday, January 7, 2005 Secretary Paige released to Congress the National Education Technology Plan 2004, *Toward a New Golden Age in American Education:*

How the Internet, the Law, and Today's Students Are Revolutionizing Expectations (2004 Plan). The 2004 Plan is based on input from thousands of students, educators, administrators, technology experts, and various stakeholders in education. Five of the seven major action steps and recommendations that the 2004 Plan outlines are Internet related: improve Internet related teacher training, support E-learning and virtual schools, encourage broadband access, move toward digital content and integrate data systems (U.S. Department of Education, 2005).

The National Council for the Accreditation of Teacher Education (NCATE) is the accreditation body for the majority of teacher education programs in the United States. NCATE believes that all teachers need to develop instructional methods in using the Internet in the classroom (National Council for the Accreditation of Teacher Education, 1997). In addition to understanding the workings of the Internet, teachers need to understand that the Internet has changed the nature of communications and the way that knowledge is accessed and presented. Teachers must also recognize that sources of information go beyond textbooks, and guide students in searching, analyzing, using and validating information on the Internet (National Council for the Accreditation of Teacher Education).

The International Society for Technology in Education (ISTE) has developed standards for the use of technology by students, teachers and administrators. ISTE standards for teachers address: (1) technology operations and concepts, (2) planning and designing learning environments and experiences, (3) teaching, learning, and the curriculum, (4) assessment and evaluation, (5) productivity and professional practice, and (6) social, ethical, legal, and human issues (International Society for Technology in

Education, 2004). ISTE standards for students include having students learn to make use of the Internet to aid in retrieving information from multiple sources, to communicate with and collaborate with people throughout the world, to develop web materials and to learn in an Internet supported project-based learning environment (International Society for Technology in Education).

The state of West Virginia has developed a vision for the use of technology that includes integration of technology throughout the curriculum so that all students will develop technology skills which support lifelong learning (WVDE Policy 2320, 2005; WVDE Policy 2470, 1997; WVDE Policy 2510, 2004; WVDE Policy 2520, 2003). Based on this vision, school technology teams were established to integrate the Content Standards and Objectives (CSOs) into the school technology plan. Technology standards for teachers in West Virginia Board of Education Policy 5310 are based on the ISTE standards for teachers. The West Virginia Department of Education Resource Guide for assessing technology standards lists examples of technology-rich instructional activities. A few of the assessment standards that affect the use of the Internet include having teachers:

- Communicate electronically
- Create customized learning materials through the use of multimedia and web page authoring.
- Evaluate quality and objectivity of websites for instructional use.
- Employ efficient and effective search techniques to use the Internet for general research.

- Provide students with strategies to assess the accuracy, relevance, appropriateness and bias of information gathered via the Internet.

Background of the Study

Computers, the Internet and related instructional technologies are here to stay. Personal computing entered the classrooms in the 1980s with the introduction of the Apple® IIe and the IBM® personal computer (PC). Since that time approximately 400,000 computers a year have been introduced into schools and student use of computers is constantly increasing (Office of Technology Assessment [OTA], 1995). Today's school systems expect and, in some instances, require teachers to use instructional technology in their classrooms. Despite the influx of computers and increased availability of instructional technology in the schools, teachers are still underutilizing these innovative educational tools (Cuban, 2001a).

Research in the 1990s shows that successful implementation of new technology in the classroom requires having the appropriate hardware and software. It is also necessary to have teachers who are trained to use the new technologies, who believe the new technologies will be an asset in their teaching, and who are willing to integrate the new technologies into the curriculum (Gibson & Oberg, 2004). Although the link between positive student achievement and the use of the Internet and other instructional technologies in the classroom remains questionable, there is evidence that the use of computer technology in the classroom is associated with better attendance (McCabe & Skinner, 2003), more independent self-directed learning (Borja, 2004), and an increase in students' basic academic skills (Manzo, 2001).

A review of related literature shows that one of the most important aspects of teachers' use of instructional technology in their classrooms is their attitude towards instructional technology and whether the teachers view it as a value to teaching and learning (Johnson & Hignite, 2000; Liaw, 2002; Luan, Fung, Nawawi, & Hong, 2005). Even teachers who believe in the benefits of instructional technology see the need for additional support from their principals, technology coordinators and peers. Teachers also need continuous training to keep abreast of future technologies in order to integrate them into the curriculum. Studies also show the need for instructional technology to be embedded in teacher education program's methods courses (Vanfossen, 2001; Wilson, Notar, & Yunker, 2003).

The Internet is one of the forces that started the expression the "world is flat," as geography, distance and time no longer separate individuals or keep people from collaborating in real time (Friedman, 2005). American doctors can send CAT scans overseas to be assessed and students in one country can have their papers graded by a teacher in a country on the other side of the world (Juskalian, 2005). This flattening effect has leveled the global playing field. With connection to the Internet, masses of people who have never competed before are now competing in the global economy (Friedman, 2005). American teachers must ensure that their students have the knowledge and competency to survive in an increasingly technology driven world economy. As the National Educational Technology Plan 2004 states:

Over the next decade, the United States will face ever increasing competition in the global economy....It is the responsibility of this nation's educational enterprise – including policymakers – to help secure our economic futures by ensuring that

our young people are adequately prepared to meet these challenges. Today, they are not. (U.S. Department of Education, 2005, p. 6)

Many teachers are now exploring new professional and instructional uses of the Internet. Studies indicate that the primary professional use of the Internet by teachers is researching materials for lessons and e-mailing (Becker, 1999; Wilson et al., 2003). New professional uses consist of using the Internet to:

- Post lecture notes or assignments
- Create or update class or school Web pages
- Communicate with parents, students, other teachers, and experts
- Participate in educational online discussions and chat rooms
- Use instant messaging in an educational environment

(Carter, 2004; Jesdanun, n.d.; National Center for Educational Statistics, 2005; Roblyer, 2004; Sunal, C., Smith, Sunal, D., & Britt, 1998; Wilkinson & Schneck, 2003).

In researching student use of the Internet in the classroom, Becker (1999) found that the most common student use of the Internet was for information gathering. New instructional uses consist of students using the Internet to:

- Participate in Web-based scavenger hunts, WebQuest projects, virtual tours, interactive websites, electronic conferences, Weblogs/Blogs and Wikis
- Communicate with experts, other students, students from another culture, and telementors
- Access online course materials, audio/video clips, libraries, encyclopedias, dictionaries, and digital online books
- Publish multimedia projects

(Lever-Duffy, McDonald, & Mizell, 2005; Provenzo, 2002; Schofield & Davidson, 2003; Sharp, 2005; Shelly, Cashman, Gunter, R., & Gunter, J., 2006; Thorsen, 2003; Wirt, 1999).

Problem Statement

Research shows that the Internet as an instructional tool is being underutilized as an educational equalizer despite extensive investment in connecting schools to the Internet, increased state and national educational standards for using the Internet and appeals from business and government for more educational use of the Internet in the classroom (Gibson & Oberg, 2004; U.S. Department of Education, 2005). Yet, many in the public and private sectors still believe the Internet can be the educational equalizer. The Internet can give students of all backgrounds, socioeconomic levels, learning styles, geographic locations, academic levels, and learning abilities access to the same information (Ertmer, Hruskocy, & Woods, 2003). The Internet allows students to experience educational opportunities previously not available, such as, interacting with authors, elected officials, and scientists (Shelly et al., 2006). Students can be visually, audibly, and even virtually transported to a world beyond their classroom walls to investigate new cultures, museums, historical places and view science experiments (Adams, 2000). Built-in translators no longer limit students to research only in their native language. The Internet provides students with the opportunity to explore whether they are in a private urban school or in a poor rural school.

The underutilization of the Internet in many cases appears to be due to a “lack of adequate training and understanding of how computers can be used to enrich the learning experience” (U.S. Department of Education, 2005, p. 22). Extensive research regarding

Internet integration in the classroom has not been conducted. Therefore, it is difficult to provide a clear picture of how the Internet is being used in the classroom.

Internet technology is still new. Research suggests that veteran teachers and teacher educators have limited or no pre-service training in integrating the Internet into the curriculum. It appears that many teachers are not aware of strategies to enhance student learning through Internet-based instruction. Therefore, there is a need to identify successful strategies to share with teachers.

Purpose of the Study

The purpose of this study is to investigate the extent to which the Internet is being used as a professional and instructional tool by West Virginia P-12 teachers and to describe West Virginia teachers' experiences in finding, creating, and using Internet resources for professional and instructional activities. Previous research indicates that the Internet is being used primarily as an informational access tool, and its potential as an innovative learning tool is largely unrealized (Becker, 1999; Gibson & Oberg, 2004; Wilson et al., 2003).

Before one can measure the outcomes of Internet integration, there must be an understanding of how teachers and students are using the Internet. Looking at how teachers use the Internet in the classroom can help pinpoint the most relevant methods that new Internet users need to learn (Karchmer, 2000). Understanding the thinking process and methods that teachers go through in integrating technology into their instruction can help others successfully integrate computers and the Internet into their classrooms (Gay, 1997).

Regardless of the potential of new technologies, the instructional value is still determined by how proficiently teachers use them in the classroom. The Internet is no different from any other classroom tool as the benefits derived from the tool are dependent upon the input (Schofield & Davidson, 2003). Proficiency is a function of preparation and with more and more being asked of today's teachers it is important to find examples where the Internet is being successfully woven into the curriculum. By collecting examples where teachers implement Internet technologies into their classroom, this study gives new and veteran teachers strategies to integrate the Internet into their curriculum.

Research Questions

Research questions addressed through quantitative methods in this study are:

1. To what extent are West Virginia P-12 teachers using the Internet as a professional tool?
2. To what extent are West Virginia P-12 teachers using the Internet as an instructional tool in their classrooms?

Qualitative methods were also used to gather anecdotal information with the following goal: To describe West Virginia teachers' experiences in finding, creating, and using Internet resources for professional and instructional activities.

Definition of Terms

The following are operational terms defined for use in this study:

To what extent

Refers to the degree (Daily, Weekly, Monthly, Quarterly, Yearly, or Don't Know/Use) to which teachers are using the Internet, as reported on the researcher developed *West Virginia Teachers' Internet Usage Survey* (Appendix A).

Internet

Refers to services found on the Internet, including but not limited to e-mail, discussion groups, teleconferencing, and the World Wide Web (Web).

Professional tool

Refers to the teacher's use of the Internet to enhance his/her professional teaching. For example, teachers may use the Internet to find lesson plans, communicate with an expert in a field of study, or complete professional development courses.

Instructional tool

Refers to the teacher's use of the Internet to enhance student learning and achievement. For example, students may use the Internet to take a virtual tour of the White House, virtually dissect a frog, or complete a scavenger hunt.

Teachers' experiences

Refers to creating and using the Internet as found in interviews with teachers who returned the Interview Contact Information form (Appendix B).

Additional definitions related to teachers' use of the Internet may be found in Appendix C, "Definitions of Terms."

Significance of the Study

The U. S. Office of Technology Assessment (1995) states that, “helping teachers use technology may well be the most important step to helping students” (p. 2). In order to better integrate the Internet into the curriculum and improve its use, curriculum specialists need to know how teachers are currently using the Internet. Using the information generated through this study, school administrators and curriculum specialists will be able to compare their expectations of how teachers should use the Internet in classroom instruction to the reported use. The administrators can then reevaluate their expectations and/or reallocate technology and professional development assets. Curriculum specialists may note the use or lack of use in various subjects and develop additional strategies for integrating the Internet into low use content areas.

Because few researchers have studied teachers’ use of the Internet, recent studies call for in-depth inquiry about Internet integration (Falvo, 1999). This study will add to the limited research regarding strategies to integrate the Internet into the curriculum. By studying the extent to which teachers are integrating the Internet into their curriculum and finding examples of Internet integration, this study will provide data that may be used to create new alternatives for training current and future teachers. Teachers often teach the way they were taught (Wilson et al., 2003). Therefore, it is important to develop and model successful concrete examples of how to integrate the Internet into the classroom. Using the examples of Internet use in this study, pre-service and in-service teacher education programs will be able to model multiple methods for integrating the Internet into classroom lessons thereby helping teachers meet national and state standards.

Limitations of the Study

This study cannot be generalized outside of the West Virginia population. Every effort was made to statistically sample the P-12 population of teachers in West Virginia. The study is only a snapshot of the time when the data were collected and is limited to self-reported information (Luan et al., 2005). Because each school's administration supports the use of the Internet at various levels, schools with stronger support may have a greater response rate to the survey.

All state supported teacher education programs in West Virginia follow NCATE Standards which include technology training. It is assumed that new teacher graduates have been trained in using educational technologies including the Internet. However, West Virginia has a declining student population and the ratio of new teachers to veteran teachers is smaller than most states, and may be a variant that warrants further study. The purpose of this study will be to discover the extent to which West Virginia P-12 teachers are using the Internet as a professional and instructional tool and to describe West Virginia teachers' experiences in finding, creating, and using Internet resources for professional and instructional activities.

CHAPTER TWO: REVIEW OF LITERATURE

The Internet is touching every aspect of human life and it is imperative that American students be educated in the use of the Internet. Students need to know how to analyze and synthesize information found on the Internet in order to compete in the global society. Because few researchers have studied how teachers use the Internet, there is a need for more in-depth inquiry about how the Internet is being integrated into today's classrooms (National School Board Foundation, 2004). An in-depth study should identify successful integration examples in order to help teachers incorporate the Internet into the classroom.

Many people use the terms Internet, World Wide Web (WWW), and Web interchangeably; therefore, it is important to know the correct definitions of these terms and their history. To understand uses of the Internet by teachers one must identify factors that influence teachers' usage of the Internet (Gay, 1997). Teachers also need examples of how the Internet is being integrated into classroom curricula. This chapter will present the history of the Internet, Internet education initiatives, factors influencing Internet use, and Internet use in education.

History of the Internet

The Internet is a collection of interconnected worldwide computer networks which links millions of computers and enables the computers to communicate with one another regardless of their physical location and operating systems. Businesses, governments, educational institutions and individuals are connected through the Internet. No one organization or country owns or controls the Internet as it does not have a centralized distribution system (Comer, 2005). The Internet is comprised of over 200

million host computers that distribute information across the globe (Lever-Duffy et al., 2005). It is estimated that more than 400 million people around the world access the Internet each year (Shelly et al., 2006).

The roots of the Internet can be traced back to the United States Department of Defense's Advanced Research Projects Agency (ARPA). The goal of ARPA was to build a network that (1) would allow scientists at different locations to share information and (2) would continue to function even if sections of the network were destroyed. The ARPA network (ARPANET) became functional in 1969 and soon underwent phenomenal growth as researchers and others realized the potential of sharing information across great distances instantaneously (Shelly et al., 2006). Since the mid-1970s the Internet has doubled in size every 9 to 14 months and has had the same pronounced influence on communication as did the Gutenberg printing press which was introduced in the 1450s and was the first printing press made for mass publication. The swiftness of the Internet's adoption has surpassed all technologies before it. Radio took 38 years to reach 50 million people; television took 13 years, while the Internet only took four years (Joo, 1999).

Switzerland's European Particle Physics laboratory (CERN) developed the initial World Wide Web (WWW or Web) standards. In 1989 Tim Berners-Lee led a team at CERN which conceived a new method for physicists to share their research data through the use of "hypertext", links that when selected provide access to other documents or websites (Centerspan, 2001). The Web was expanded in 1992, by a group at the University of Illinois who developed the Mosaic browser, a software application that allowed embedded graphics to operate as hyperlinks in a document.

At the same time that the World Wide Web was evolving, the United States government decided to reduce its funding for its Internet projects. Policies controlling Internet use were relaxed and the Internet was opened for commercial use (Comer, 2005). All of this led to the creation of Internet Service Providers (ISP) and Online Service Providers (OSP), companies which provide business and home computers Internet connection for a fee (Lever-Duffy et al., 2005). Online Service Providers (OSP) additionally supply such services as: financial data, news, weather, legal information, and other similar commodities (Shelly et al., 2006). Two of the more popular Online Service Providers are America Online and Microsoft Network.

Although the Internet is commonly thought of as the Web, the Internet consists of multiple data systems. Some of the most popular data systems are: e-mail (exchange of electronic mail messages), USENET newsgroups (posting and responding to public messages on a bulletin board), File Transfer Protocol (FTP, the protocol which standardizes the exchange of files with other computers on the Internet), Internet Relay Chat (IRC, real time typed conversations on the Internet), CU-SeeMe (videoconferencing system on the Internet), and the World Wide Web (Lever-Duffy et al., 2005; Roblyer, 2003a; Shelly et al., 2006). The Web with its hundreds of thousands of documents, databases, resources, and projects are all made accessible through the Internet (Bissell, Manring, & Rowland, 2001).

In 1999, a new Internet, Internet2, was created. This non-profit consortium is made up of over 200 United States universities, 60 leading companies and governmental agencies. The consortium did not create a separate physical network, but is developing and testing new technologies that will enable revolutionary Internet applications, such as:

faster e-mail, virtual laboratories, independent learning and tele-immersion (Internet2, 2005). The long-term goal of Internet2 is to accelerate the diffusion of advanced Internet technology to help sustain the United States' leadership in the technologies that keep the Internet working. Internet2 will benefit non-members especially P-12 schools and public libraries, which can take advantage of faster access and more applications to expand their digital libraries, virtual laboratories, and distance learning courses.

Internet Education Initiatives

In 1996 President Clinton and Vice President Gore announced the Technology Literacy Challenge, which envisioned that all students in the 21st century would be technologically literate. The first of four goals states:

All teachers in the nation will have the training and support they need to help students learn using computers and the information superhighway (U.S.

Department of Education, 1996, ¶5).

To meet this goal school districts often spend 6 to 15% of their technology budget on professional development on using computers and the information superhighway (Internet), but this training often only focuses on basic computer operations instead of curriculum integration (Franklin, Turner, Kariuki, & Duran, 2002). In order to help students use the Internet teachers must learn instructional strategies for integrating the Internet into their curriculum.

Schools have acquired computers and Internet access at rapid rates (Gay, 1997). Educators use the Internet to search, locate and communicate information, as well as develop learning activities that tap into the World Wide Web. The Internet makes it possible for educators to interact globally to discover new perspectives and broaden

personal horizons (Lever-Duffy et al., 2005). The Internet provides educators with additional resources when planning lessons and allows them to communicate with parents, students, colleagues and school administrators through e-mail and web pages (Bebell, Russell, & O'Dwyer, 2004; Becker, 1999; Jesdanun, n.d.; Lerman, 1998; Nixon, 2002; Provenzo, 2002; Sunal et al., 1998; Wilkinson & Schneck, 2003). One of the first public opinion polls of Internet use taken by Sun Microsystems (1997) showed that teachers use the Internet:

- To access hard-to-find information and resources (65%)
- To increase students' familiarity with information technology (57%)
- To obtain information on current events in order to update their textbooks (54%)
- To help develop lesson plans (48%)

Becker's (1999) survey of 2,250 fourth through twelfth grade teachers, regarding their use of the Internet, found the majority of teachers (68%) use the Internet weekly to find information resources for lessons. A relatively small percentage of teachers use the Internet to publish information. Becker emphasizes that this use should increase as more teachers become familiar with the Internet. Regarding student use of the Internet, the most common is information gathering. Less than 7% of teachers have students use the Internet to contact experts, collaborate on joint projects with other schools, or publish findings on the Internet. Becker's study also identified three major predictors influencing teachers' use of the Internet: connectivity, computer expertise, and constructivist pedagogy.

In 2000, the Office of Vocational and Adult Education sponsored a \$4.5 million grant to study Internet integration in American high schools. Five high schools, which had a career and technical curriculum, were studied for a two year period. Researchers identified the high schools as being “highly” connected to the Internet. School administrators, teachers, counselors, technology coordinators and students were surveyed and over two hundred staff and students were interviewed. The study found the following to be important in achieving school-wide Internet integration: “commitment, leadership, funding, technical and curricular support, teacher training, and a collegial school climate” (Thomas, Adams, Meghani, & Smith, 2002, p. xiv). The study also found that teachers and students use the Internet because it is current, unique, comprehensive, easy to use, and convenient. Using the Internet also broadens students’ awareness and expands teachers’ knowledge and skills (Thomas et al.).

Since 1994 the National Center for Education Statistics (NCES) has tracked schools’ and classrooms’ access to information technology. Early reports focused on the availability and use of technology, barriers to teachers’ use of technology, and teacher preparation and training (Smerdon & Cronen, 2000). Recent reports focus on: school connectivity, student access to computers and the Internet, school websites, technologies and procedures to prevent student access to inappropriate material on the Internet, and the amount of teacher professional development on how to integrate the Internet into the curriculum (National Center for Education Statistics [NCES], 2005).

Factors Influencing Internet Use

There are a number of factors that influence the use of the Internet by P-12 schools and teachers. Factors include Internet infrastructure and connectivity in schools,

Internet access, school personnel, teacher concerns and support for the Internet (Becker, 1999; Dawson & Rakes, 2003; Hanson & Carlson, 2005; Robinson, 2002; Schofield & Davidson, 2002; Yildirim, 2000). The National School Board Foundation's (NSBF) survey of technology decision makers in 811 school districts, including 90 of the 100 largest school districts with over 25,000 students, found that the amount of technology funding and teachers' preparation to integrate technology into the classroom were two factors that influence Internet usage. The study concluded that the focus of funding needs to change from how schools are connected to how technology is being used (National School Board Foundation, 2004).

Internet Infrastructure and Connectivity in Schools

When looking at the infrastructure, school connectivity needs to be considered. Becker (1999) found that the most important variable in predicting Internet use in the classroom was the school's level of connectivity. Teachers with high speed connectivity in their classrooms were more likely to make regular use of the Internet (Becker, 1999). Schools are usually connected to the Internet via a direct connection using broadband or a dial up connection via an Internet Service Provider (Roblyer, 2003b). Broadband can be Internet access via cable modems or a Digital Subscriber Line (DSL), which is broadband through telephone lines. In order to download complex, content-rich Internet resources teachers and students need a broadband connection (Shelly et al., 2006). The number of Internet connections in the school and the location of the Internet connected computers are two other important considerations when looking at Internet use.

Internet Access in U.S. Schools

The National Center for Education Statistics reported that in the fall of 2003 nearly all U. S. schools had Internet access: 93% of public schools' instructional classrooms had Internet access, 95% of public schools used broadband connection, and 32% used wireless connections (Parsad & Jones, 2005). Market Data Retrieval, a market-research firm, reported that 48% of instructional computers in schools run on Windows 98 software and 29% run on Windows 2000, NT, or XP (Park & Staresina, 2004). In 2003, the number of computers in the classroom grew to one computer for every 7.9 students; and the number of Internet-connected computers in the classroom increased to one computer for every 8.4 students (Park & Staresina).

Owsten and Wideman (2001) studied elementary students in seven schools of an urban school district to determine what computer-to-student ratio produced the best results for successful student writing. The classrooms were divided into three different computer-to student ratios: 1:1, 1:2, 1:4 and a control group without any computers. The classrooms were regularly observed and three writing samples were taken during the school year. Classrooms with the 1:2 ratio improved significantly more than the other groups with the control group showing the least improvement (Owsten & Wideman).

Internet Access in West Virginia Schools

Education Week's special report, Technology Counts, reports that 95% of the 784 public schools in West Virginia have Internet access from one or more classrooms (Technology Counts, 2004). In 77% of the schools, at least half of the teachers use the Internet for instruction. The report found one Internet-connected computer for every 3.7 students and one classroom Internet-connected computer for every seven students. Thus,

West Virginia's ratio of students to Internet-connected computers in the classroom is better than the national average.

Enhancing the Technology Infrastructure

In order to increase school connectivity, President Clinton in his 1996 State of the Union Address set a goal of having access to the Internet in every American classroom by 2000 (Sunal et al., 1998). To help schools and public libraries afford Internet access, the United States (U.S.) Congress passed the *Telecommunications Act of 1996*, co-authored by U.S. Senator Jay Rockefeller of West Virginia, requiring that schools and public libraries be provided with affordable telecommunication services from the Universal Service Fund. The next year the Federal Communications Commission approved the Education Rate (E-Rate), a program to provide P-12 schools and all public libraries with discounted telecommunications services. Through E-Rate, eligible schools and public libraries receive discounts of 20 to 90% on telecommunication services, Internet access and internal connections necessary to have Internet connection in the classroom. The discount levels for schools are based upon the level of eligibility in the federal free and reduced lunch programs. The discount level for public libraries is the same as the eligibility percentage of local school districts.

The E-Rate Program offers great flexibility in choosing different types of commercially available telecommunications services. Schools and libraries have used the funds for regular telephone lines to the classroom, coaxial cable, satellite delivery for distance learning, and high bandwidth telecommunication services. All services for accessing the Internet, except for paid subscription service, are eligible for the E-Rate discount. School systems are eligible to purchase the following equipment: routers, hubs,

switches, network file servers, wireless Local Area Networks, plus all the software needed for operation of file servers (U.S. Department of Education, 2005). By 2004, the E-Rate program invested more than \$14 billion to connect public libraries and P-12 classrooms, with the result that nearly all U.S. students have access to the Internet at school (Shelly et al., 2006). While E-Rate has transformed the technology infrastructure of the American school system, it has not provided funding for teacher training, computers for teachers and students, educational software, or instructional support. Likewise having access to the Internet does not mean that the Internet will be used to construct meaningful learning (Sunal et al., 1998).

School Personnel and Internet Use

In addition to the technology infrastructure in schools, other factors that influence Internet use in the classroom are computer knowledge, skill level and attitudes of teachers and school administrators. The classroom is often seen as the teacher's own "private domain for independent professional action" (Schofield & Davidson, 2002, p. 133). Therefore, teachers' attitudes toward computer use in general, their knowledge of ways to infuse the Internet into the curriculum, their willingness to adopt new teaching models and their pedagogical beliefs and practices affect their use of the Internet (Becker, 1999; Hanson & Carlson, 2005; Wepner & Tao, 2002). Studies show that there is a need for professional training that develops teachers' pedagogical knowledge for using the Internet (Vanfossen, 2001; Wilson et al., 2003). Teachers who want to use the Internet cite a lack of consultation from the administration as to what equipment is needed, lack of time for training and retraining, lack of enthusiasm for integration, and limited planning

time as barriers to using the Internet (Hanson & Carlson, 2005; Reese & Zembylas, 1999; Rodriguez & Kendrick, 2005; Schofield & Davidson, 2003; Vanfossen, 2001).

Teachers' Attitudes and Pedagogical Beliefs

The method and degree to which technology is used in the classroom is often based on teachers' attitudes toward technology and their pedagogical beliefs (Becker, 1999; Hanson & Carlson, 2005; Woodbridge, 2004). Wepner and Tao's (2002) study found that integration of technology depended on teachers' willingness to use it. Luan, Fung, Nawawi, and Hong (2005), studied 313 pre-service teachers and found a positive correlation between teachers' attitudes and the amount of time spent using and integrating the Internet into their classroom instruction.

Wilson, Notar and Yunker (2003) in their study of pre-service and in-service teachers, noted that teachers tend to teach the way they were taught as students. Since the use of the Internet as a teaching tool did not become popular in schools until after 1991, the majority of today's teachers do not have role models for integrating the Internet into the classroom. Also, courses required by teacher education programs to meet national and state technology standards may not give pre-service teachers the confidence they need to utilize the skills taught in these programs (Wilson et al.).

Technology integration involves understanding educators' beliefs in learning and technology, as well as their motivations and perceptions (Woodbridge, 2004). Teachers who look at education as the distribution of facts and skills are less likely to take advantage of the Internet than teachers who have a more "constructivist" belief (Becker, 1999). A constructivist approach to teaching involves having students actively participate in the learning process, a process where the student constructs or forms much of what he

or she learns. Using the Internet, students can actively participate in problem-solving and critical thinking activities (Shelly et al., 2006).

Woodbridge (2004) studied teachers with a common educational background in computer technology knowledge and who were participating in Jacksonville University's Master of Arts in Teaching program. The study consisted of forty-two classroom observations, twenty interviews, and twenty-seven participants who completed an online survey. The study explored the relationship between teachers' beliefs and their strategies to integrate technology in the classroom and found a positive correlation between integrating technology in the classroom and having a philosophy based on constructivist teaching strategies (Woodbridge).

Teacher Planning Time

It is difficult for teachers to find extra time to work with computers, share their experiences with others, plan lessons that incorporate the Internet, and attend training and workshop sessions (Ertmer, Addison, Lane, Ross, & Woods, 1999; Franklin et al., 2002; Office of Technology Assessment, 1995; Schofield & Davidson, 2003). The time available to teachers has not increased proportionally to the changing curriculum requirements (Cuban, 2001b). Because teachers have to rethink, redesign, and create new curriculum activities when they integrate the Internet, they often feel that they are starting over as novices (Gay, 1997; Wepner & Tao, 2002).

Teacher Training

Along with the influx of computers and their associated technologies in the classroom comes the realization that most teachers have little experience with computers and insufficient training to use them as professional and instructional tools. Believing that

newly licensed teachers have more computer knowledge, principals look to new teachers as the answer to increasing or improving technology integration in classrooms (Woodbridge, 2004). However, Darling-Hammond, Chung, and Frelow (2002) studied data from a 1998 survey of over 3,000 beginning teachers in New York City. They found many teachers did not feel adequately prepared to use technology. Woodbridge (2004) found that new teachers are more focused on gaining teaching experience and increasing their classroom management skills than in trying to integrate technology.

Vanfossen (2001) surveyed 350 Indiana middle and high school social studies teachers as to their use of the Internet, training in the use of the Internet and their perceived barriers in using the Internet. The majority, over 85%, reported that they use the Internet for professional use (i.e. planning and research). More than one-third of these teachers used the Internet at least three times a week. Teachers were asked to indicate the degree to which they had engaged in nine types of Internet use. "Encouraging students to use the Internet to gather background information" was the only type of student Internet use that a majority, 81% of teachers, used. Less than 10% indicated that they had students use the Internet for creating multimedia reports, e-mailing content experts, using interactive lessons, creating web pages, or taking a virtual fieldtrip (Vanfossen).

Smerdon and Cronen (2000) cited a U.S. Department of Education report that indicated, in 1999, only half of public school teachers reported using the Internet for instruction during class time, only one-third reported that they felt prepared to use the Internet for instruction, and less than 20% felt adequately prepared to integrate technology into their instruction. To help solve these problems school districts began offering professional development on how to integrate the Internet into the curriculum. In

2003, 82% of schools reported that their school districts offered professional development that focused on Internet integration (National Center for Educational Statistics, 2005). However, Gay (1997) found that teachers understood and learned more about technology as they worked through problems that occurred in the classroom. Schofield and Davidson (2003) found that teachers wanted to select appropriate Internet activities for their classrooms and that when teachers initiated and designed activities themselves, they were more invested in using the Internet.

National Teacher Training Initiatives

At the national level, the International Society for Technology in Education (ISTE) was formed in 1989 to help K-12 teachers and administrators share effective strategies to enhance student learning through the use of computers and other technologies. Later in 1993, ISTE introduced their first edition of *National Educational Technology Standards for Teachers (NETS*T)* which was revised in 1997 and 2000. The National Council for Accreditation of Teacher Education (NCATE) joined ISTE in 1997 to revise the standards for pre-service teacher education programs (International Society for Technology in Education, 2000). The general preparation performance profile in ISTE's book on *Preparing Teachers to Use Technology* outlines the following goals.

Teacher candidates should be able to:

- Differentiate between appropriate and inappropriate uses of technology for teaching and learning while using electronic resources to design and implement learning activities
- Plan for the management of electronic instructional resources within a lesson design by identifying potential problems and planning for solutions

- Design and teach technology-enriched learning activities that connect content standards with student technology standards and meet the diverse needs of students
- Research and evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information resources to be used by students
- Integrate technology-based assessment strategies and tools into plans for evaluating specific learning activities
- Apply online and other technology resources to support problem solving and related decision making for maximizing student learning
- Participate in online professional collaborations with peers and experts.

(International Society for Technology in Education, 2002, p. 13)

In 2000, ISTE released their National Educational Technology Standards for Students (NETS*S). In 2003 the state of West Virginia began using the NETS*S within their Technology Content Standards and Objectives (S. Meade, personal communication, July 18, 2002). These standards include:

- Students are proficient in the use of technology
- Students practice responsible use of technology information
- Student use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences
- Students use a variety of media and formats to communicate information and ideas effectively to multiple audiences

- Students use technology to locate, evaluate, and collect information from a variety of sources
- Students evaluate and select new information resources and technological innovations based on appropriateness for specific tasks

(International Society for Technology in Education, 2000, p. 14)

If teachers are going to infuse the Internet into the curriculum they must be provided with pedagogical support through observation of technology-enriched lessons. For the Internet to be an effective educational resource for students in meeting educational goals, the use of the Internet must be part of the daily curriculum. To aid in the design of technology's professional development it is essential to gather information about teachers' perceptions of technology (Gay, 1997). In order to incorporate technology into the curriculum in meaningful ways, teachers need both administrative support and in-service training in the use of technology applications (Ertmer et al., 1999).

West Virginia Teacher Training Initiatives

In 1982 West Virginia University developed "Workshop on Microcomputers in Education" to help teachers overcome their fear of computers, acquire basic operational knowledge and skills and showcase benefits of computer technology (Skinner & Warmuth, 1983). That same year the *West Virginia Microcomputer Educational Network (WVMEN)* was formed to provide electronic mail, electronic bulletins, electronic conference areas, public domain software and curriculum material for educators, students, parents, and local community members (West Virginia Department of Education, 2002).

Since 1994 the state of West Virginia has received over \$15 million to help West Virginia teachers integrate technologies into their classrooms through projects with an Internet component. Funded projects include: Trek21, RuralNet, Turnkey Solution, World School, IBM Reinventing Education, and SAS inSchool. Teachers who participated in the Trek 21 project created and published technology integrated lesson plans on the Internet through the Trek 21 website (Trek 21, 2001). The RuralNet project provided technology training to approximately 1,000 teachers, with the goal of encouraging and aiding teachers in using the Internet to enhance science and math instruction (Falvo, 1999). The Turnkey Solution project trained over 13,000 teachers to integrate technology. Teachers created and published over 800 peer-evaluated lesson plans on the website called The Solution Site (Solutionsite, 2004). The World School project developed educational infrastructures, provided funding for multimedia courseware and allowed teachers to work together on Internet classroom projects (NASCIO, 2001). The IBM Reinventing Education project provided funding to improve student learning through developing and creating instructional plans that use the Internet. One goal of the project was to find Internet resources that matched the West Virginia Instructional Goals and Objectives for middle and high schools mathematics, language arts, science and social studies content areas. During the fall of 2005, the IBM Reinventing Education project focused on finding Internet resources for all grade levels (D. Landin, personal communication, October 4, 2005).

West Virginia Department of Education's Office of Technology and Information Systems (OTIS) has provided Web-based educational technology in all of the states' school districts (SAS Institute, 2005). West Virginia's Champion Schools is one of the

first SAS inSchool statewide programs in the nation. SAS inSchool Curriculum Pathways® software is a Web-based planning resource for instruction in the core disciplines of English, mathematics, social studies, science and Spanish, for teachers and students in grades 8-14. The software provides simulations, multimedia resources, guided online research and Web-based learning activities correlated to National and State standards (SAS Institute).

Technology Support from Administrators and Other Teachers

Other factors influencing the use of the Internet by a teacher are the teacher's administrators and peers. Dawson and Rakes' (2003) study on the influence of school principals' technology training showed a correlation between the amount and type of training principals received and the level of technology within their school's curricula. When leaders of the school share their enthusiasm and knowledge of the Internet with teachers the result is a broader use of the Internet in the classroom (Becker, 1999). Studies also show that current use of technology by other teachers in a school will influence each teacher's attitude toward computers and their use (Yildirim, 2000). Robinson's (2002) survey of 759 educators showed that teachers regarded technical and peer support as the most effective methods for learning technology integration skills. In fact, Becker (1999) found a direct relationship between the number of informal contacts teachers had with other teachers at their school and their Internet use. These informal interactions and discussions of the Internet help teachers learn more about the Internet and integrating it into teaching (Becker).

Piper and Hardesty's (2005) study, consisting of 160 teachers in 11 school districts with Internet ready computers in every classroom, found that the attitude of a

teacher who is learning to use computers in the classroom was most significantly influenced by the “inspirational motivation style of their school leaders” (Piper & Hardesty, 2005, Findings, ¶1). Teachers want leaders who understand their needs, are supportive and provide necessary assistance. The researchers concluded by stating that lack of leadership will cause “computers in the classroom to remain in the off position” (Piper & Hardesty, 2005, Importance to the Field, ¶ 5).

Teachers’ Concerns and Considerations

The Internet provides many benefits and at the same time causes concerns and problems for users. As the Internet becomes a significant educational tool in the classroom, problems are raised about its use and control. Educators are concerned with student access to the Internet known as the digital divide, the rise in plagiarism, the protection of student privacy, and media literacy which includes evaluating websites (Hanson & Carlson, 2005; Lever-Duffy et al., 2005; McMurtry, 2001; Parsad & Jones, 2005; Scott, 2003; Shelly et al., 2006). Other problems arise because the Internet is still developing and many of the websites are continuously being deleted, updated, moved or changed. Often students and educators find “File Not Found” messages, long delays and even frozen screens.

The Digital Divide

Although E-Rate has helped establish Internet connections in schools, there is still inequity of access to the Internet in the homes of students. A problem with assigning homework that requires the Internet is that teachers have to be aware of students in the class who might not have Internet access at home (Hanson & Carlson, 2005).

Arrangements often have to be made for students to have time during school to use an

Internet-connected computer. A National Center for Education Statistics (NCES) study showed that 72% of 4th-graders and 76% of 8th-graders who are eligible for free or reduced-price lunches reported that they have a home computer; whereas 93% of 4th-graders and 95% of 8th-graders not on free or reduced-price lunches have home computers (Parsad & Jones, 2005). However, the presence of a home computer does not insure a home Internet connection.

Parsad and Jones (2005) also found that 48% of public schools are making Internet-connected computers available to students outside of regular school hours. However, schools with a larger percentage of children eligible for free or reduced-price lunches had a smaller percentage of their schools open outside of regular school hours. Schools with a high percentage of minority enrollments have fewer computers per student available outside of regular school hours than the schools with a low percentage of minority enrollment (Parsad & Jones). Thus, students who most need access to the Internet-connected computers after regular school hours have less access to computers.

There is also a discrepancy between high and low-minority schools in the ability of teachers to use computers. An Education Week (2005) survey found that 12.5% of high-minority schools reported their teachers were classified as beginners in using technology, while only 7.5% of low-minority schools reported the same.

Plagiarism Concerns

Although plagiarism and copyright violations were educational concerns before the Internet, the ease of accessing and incorporating digital content through copying and pasting has developed a new and complex problem (Lever-Duffy et al., 2005). Students can purchase complete papers on the Internet from sites that sell reports in any discipline

and at any academic level all the way from elementary school projects to doctoral dissertations. McMurtry (2001) graded papers from a Spring 1999 English composition class of 61 students and caught five plagiarists all of whom had downloaded papers from the Web.

Harris (2002) made several suggestions for reducing plagiarism in the classroom. The first step is for teachers to educate themselves and their students about plagiarism and discuss the benefits of citing sources. Assignments as well as penalties need to be clearly stated. To help reduce plagiarism Harris suggested that reports should be both written and oral and include an annotated bibliography with current references.

Privacy and Security Issues

Teachers must be careful to guard the privacy and security of students when creating a teachers' website and allowing students to post information to websites. Parental permission should first be obtained before sharing any student's work on a website, and the student's full name, picture or any detailed information should not appear on the teacher's website (Scott, 2003; Shelly et al., 2006).

Parents and educators are concerned with inappropriate material available on the Internet. To protect students, the Children's Internet Protection Act (CIPA) was passed by Congress in December, 2000. Under this Act schools and libraries receiving E-Rate discounts must certify that they are enforcing an Internet safety policy that includes the use of filtering or blocking technology (Federal Communications Commission, 2003). With filtering and monitoring software, the teacher can customize lists of sites that are appropriate for students and keep track of student Internet activities (Sharp, 2005). Ninety-nine percent of public schools use at least one filtering technology on all Internet-

connected computers used by students. Additionally, 93% reported that teachers or other staff members monitored student Internet access (Parsad & Jones, 2005).

Along with having filtering programs, many schools have developed an Internet Acceptable Use Policy (AUP), which must be signed by students and their parents (Shelly et al., 2006). This policy governs the use of the Internet by teachers, administrators, staff and students. Some schools publish the AUP form on their website, thereby allowing new students and parents to access and review the form at home. AUPs outline rules dealing with copyright, accessing objectionable Internet sites, online safety and release of personal information, as well as notice of disciplinary action and possible permanent cancellation of school Internet access privileges (Shelly et al.).

Media Literacy

The Center for Media Literacy defines media literacy as the “framework to access, analyze, evaluate and create messages in a variety of forms – from print to video to the Internet” (Center for Media Literacy, 2002, ¶4). Teachers’ concerns over invalid information on the Internet (Shelly et al., 2006) make the evaluation process critical. Unlike books, which have their author’s credentials verified and their content reviewed for accuracy and objectivity by editors, websites do not have such safeguards. Because some websites are not readily recognized as being inappropriate for use in a classroom and may contain inaccurate, biased or incomplete information, it is important for educators to evaluate websites and to teach their students how to evaluate sites. Shelly et al. (2006) give the following as criteria to consider when evaluating websites: authority, affiliation, content, audience, currency, purpose, objectivity and web design. Evaluating websites can be a useful and motivational way to teach students skills they will need to be

knowledgeable consumers and developers of visual and textual information (Roblyer, 2004).

The Internet and other technologies have created a new form of literacy, electronic literacy, one that does not heavily rely on the ability to read and write (Karchmer, 2000). For centuries writing systems have been linear, a line of symbols read sequentially. In electronic environments linear text is replaced by hypertext which allows the reader to easily explore other relevant materials (Topping, 1997). The ability to use links within stories allows readers to click on graphics that link to video clips or animations that further explain concepts. Using electronic text, readers can focus on word meanings and use digitized pronunciation links to hear words. Text and graphic displays can cue readers' attention to hyperlinks that can illustrate a complex process to increase comprehension (Reinking, n.d.). Using hyperlinks students are more engaged in their learning and define their own learning paths (Shelly et al., 2006).

Support for the Internet

The Pew Internet and American Life Project reported that on a typical day in 2004 some 70 million American adults logged onto the Internet, which represents a 37% increase from 2000 (Fox, Anderson & Rainie, 2005). The Internet touches almost everything that happens in today's society: food, medical supplies, airplane tickets, event tickets, clothes, books, and even parts for garage door openers are purchased via the Internet. People use the Internet to check the weather, verify the time for events, study news items, check sports scores, auction off their possessions, and even post the birth of a new grandchild (Fox et al., 2005). Those who do not go online are becoming the minority. Teachers need to instruct students in ways to research, collect and analyze

online information. The ability to use of the Internet has become integral to the American society.

West Virginia Internet Initiatives

In addition to using the ISTE Technology Standards for P-12 students, the state of West Virginia is committed to the use of technology by teachers. The West Virginia Department of Education Policy 2510 (2004) states that:

Technology must play a major role in the delivery of all programs of study.

Technology will be used as part of the delivery process for instruction and providing information for students. The use of technology, particularly computers, will also be a part of the curriculum so that students develop skills and know how to use technology as an effective tool for learning, processing information, and communicating information to others. (Part 9.8)

In 1990 the West Virginia Basic Skills/Computer Education Program started providing hardware, software and training for K-6 students to learn basic skills with goals of improving skills in reading, writing, mathematics, and computer literacy plus providing teacher training. The Basic Skills Program placed more than 30,000 computers in West Virginia K-6 classrooms and is considered the nations' longest-running state program for implementing technology in education by the Milken Exchange on Education Technology (Burrall, 2003).

West Virginia SUCCESS (Student Utilization of Computers in Curriculum for the Enhancement of Scholastic Skills) Initiative provides quality technology tools for students. The intent of SUCCESS is to balance the utilization of the Internet, state programs and local technology initiatives. SUCCESS has two tiers, with the first

including integrating a functional networked system into curriculum areas. If a file server was not included in the first tier then it was added during the second tier. The second tier included integration of workplace simulation software, as well as, college exploration and decision making into the curriculum. SUCCESS also included staff development which gave the teachers skills for integrating new technologies (Burrall, 2003).

West Virginia is currently exploring means to increase the utilization of online courses. West Virginia Governor Joe Manchin in his 2005 State of the State Address said that his wife, Gayle Manchin, would be working on plans to promote distance-learning initiatives (Samuels, 2005). West Virginia is a state of small county school districts, which are facing consolidation due to the lack of upper-level course teachers. By offering online courses, distance learning is one way to help West Virginia students obtain the classes that they want and need (Goldstein, 2004).

Internet Use in Education

The Internet can be used by teachers as both a professional and instructional tool. Professionally, teachers use the Internet in a wide variety of venues ranging from gathering ideas and materials for lesson plans to communicating with parents to participating in online educational discussions. Instructionally, teachers use the Internet to enhance the educational process in their classrooms. The Internet's multimedia has the capability to address a variety of learning styles. Internet group projects and problem solving activities can require students to use higher order thinking skills (Shelly et al., 2006).

Teachers' Professional Use of the Internet

The Internet has brought about many changes in classroom roles and relationships between teachers and students. Student autonomy has increased as students become seekers of new sources for information and publishers of information (Schofield & Davidson, 2003). Teachers and students become co-learners as students bring new information found on the Internet to class. This activity has caused a shift from teachers as disseminators of knowledge to participants in the learning process (Slowinski, 1999).

The primary professional use of the Internet by teachers is searching for material for lessons (Becker, 1999; Wilson et al., 2003). Many teachers are now exploring other professional uses, such as:

- Posting lecture notes or assignments
- Creating or updating class or school Web pages
- Communicating with parents, students, other teachers, and experts
- Participating in educational online discussions and chat rooms
- Using instant messaging in an educational environment

(Carter, 2004; Jesdanun, 2005; National Center for Educational Statistics, 2005; Roblyer, 2004; Sunal et al., 1998; Wilkinson & Schneck, 2003).

Enhance Instruction

Becker (1999) found that 68% of teachers use the Internet to find resources for lessons. Thousands of lesson plans can be found on the Internet. Teachers can easily search by grade, subject, and topic to find lessons that will match their state's curriculum standards and objectives. Using search engines, teachers can find lessons that directly

connect to what they are teaching; this is key to integrating the Internet into their instruction (Baumbach, 1998).

Collaboration with Experts and Other Teachers

Many lesson plan sites allow discussion with other teachers. Teachers can use educational magazines, mailing lists (listservs), newsgroups or discussion groups on the Internet to share ideas, problems, solutions and lesson plans with other educators (Sunal et al., 1998). Electronic magazines and journals with their hyperlinks to similar articles help teachers stay abreast of current events in their content area. Through various discussion forums educators can access the latest trends and issues in education.

Improve Communication between Schools and Parents

Since nearly all public schools are connected to the Internet, schools have the capability to make information available to parents and students through either e-mail or school websites. The Internet has emerged as an effective and efficient way for today's working parents to be engaged in their child's educational progress (Nixon, 2002). The National Center for Educational Statistics (2005) reported that 88% of public schools have websites, with 73% reporting that their websites are updated at least monthly. However, the number of schools having websites decreases as the poverty concentration increases. Over a quarter of the schools with websites reported that teachers or other staff members were the webmaster for the school site, while other schools reported having outside consultants as their webmaster (National Center for Educational Statistics, 2005). A school website enables parents and students to keep abreast of the school's activities, lunch menus, athletic information, deadlines for college applications, school policies and PTA notes. Most school websites include the school's background, address, key phone

numbers, information about the community, teacher homepages, school and lunch calendars, extracurricular activity schedules, as well as student homepages (Provenzo, 2002). Using passwords on a school's website, parents can access their child's classroom assignments, look at classroom projects or check their child's grades (Jesdanun, 2005).

Through the creation of a classroom website, teachers can enhance communication with their students, peers and administrators (Lever-Duffy et al., 2005). The classroom website supports communication by containing daily, weekly, or chapter assignments. The website can also contain information about how to complete an assignment as well as links to related pages or websites. Because many teachers at a school do not have the same planning time, it is hard for them to have face-to-face meetings. E-mail, discussion boards, instant messaging and teacher websites provide alternatives for interacting with colleagues and sharing information (Abram, 2004; Lever-Duffy et al., 2005; Silverman, 2005).

Wilkinson and Schneck (2003) examined the effect of a school's physical education/health website on parental knowledge of the physical education/health program. Four physical education and two health classes developed a website that explained class assignments and activities that students were doing. Ninety-four parents completed a pre and post website questionnaire. The study indicated that the majority of parents found the website useful and as a result they knew more about their child's activities at school (Wilkinson & Schneck).

E-mail allows teachers and parents to communicate at any time without the hassle of lost messages or playing phone tag (Nixon, 2002). Teachers can communicate with parents and parents with teachers at their convenience. Through e-mail and the school's

website, teachers, students, and parents can easily exchange information and keep each other updated (Roblyer, 2004).

Online Professional Development

Elementary and secondary school teachers are expected to participate in professional development activities. The National Center for Education Statistics (2005) reporting on the characteristics of teachers' professional development activities during the 1999-2000 school year cited that 73% of public school teachers reported participating in some form of professional development activity. Trying to meet the No Child Left Behind mandate of a high-quality professional development program many school districts are offering online professional development courses. Online courses allow teachers to learn at their convenience and reduce travel costs. Carter (2004) found that a blended approach of in-person meetings and online classes works best for some teachers. Online professional development is still growing and changing to meet the challenges of time, technology, and motivation.

Instant Messaging

Instant messaging (IM) is a service that allows teachers to create a private chat room which only members of a mutually agreed-upon list may enter (Roblyer, 2003a). The service alerts users when members of their list are online and allows them to communicate with one another. The Pew Internet and American Life Project found 62% of Internet users aged 18-27 use instant messaging (Poftak, 2004). Teachers can maintain IM "office hours" during which students know that they can IM their teachers for help (Abram, 2004). Silverman (2005) reports that Kirksville R-III School District in Missouri is using IM for: communicating with staff, informing custodians of circumstances

needing their attention, distributing absentee lists and weekly athletic schedules, announcing weather conditions and keeping staff abreast of developing situations. Administrators report that using IM saves office staff time on printing memos and bulletins, at times replaces the intercom system and is especially useful for security situations (Silverman).

Enhance Classroom Instruction

Schofield and Davidson (2003) conducted a five year qualitative study of a large urban school district in which it was found that the Internet changed classroom roles and relationships. Teachers discovered that when using the Internet with small group work, the student-teacher relations became more personal. The Internet also increased student autonomy as the students accessed external resources and knowledge disparity between teachers and students changed. Teachers also saw an increase in student enjoyment and motivation (Schofield & Davidson).

Scheider (2003) conducted experimental research with two tenth grade global history classes taught by the same teacher in the Mount Sinai School District. The control group was taught in a traditional manner and the experimental group was taught with web infused curriculum. The researcher surveyed both parents and students as to the increase in student interest and motivation. Both students and parents in the experimental group felt that there was an increase in student interest and motivation. The experimental group also achieved an 8% higher mastery level on the New York State Global History Regents exam (Scheider).

Luft (1997) found that searching for resources and accessing multimedia applications on the Internet helped to engage hearing impaired students at a higher level.

By having data in a graphic form, the Internet provided the information in a manner that was most effective for these students. Lessons using the Internet provided visual access to data that was most meaningful to hearing impaired learners (Luft).

To effectively use the Internet requires that the Internet be integrated into regular classroom lessons. Having students “surf” the Internet without a clear purpose is a limiting experience. Teachers need to carefully think about their curriculum and ask: “How can this new technology improve instruction?” (Provenzo, 2002, p. 111).

Taking into consideration the curriculum and the learning objectives, teachers can create projects that take advantage of Internet-based resources to motivate students (Thorsen, 2003). Students can use the Internet to:

- Participate in Web-based scavenger hunts, WebQuest projects, virtual tours, interactive websites, electronic conferences, Weblogs/Blogs and Wikis
- Communicate with experts, other students, students from another culture, and telementors
- Access online course materials, audio/video clips, libraries, encyclopedias, dictionaries, and online books
- Publish multimedia projects

(Lever-Duffy et al., 2005; Provenzo, 2002; Schofield & Davidson, 2003; Sharp, 2002; Shelly et al., 2004; Thorsen, 2003; Wirt, 1999).

Students conducting research projects can use online databases and resources. Students are no longer limited to their hometown newspapers and magazines, as students can easily access online newspapers from around the world. Besides world newspapers,

students can access various countries' online newscasts, and are able to compare what is being written by local, national and world news organizations (Sharp, 2002).

The use of Internet technology in education has led to the creation of e-learning initiatives that include online courses, virtual schools, Internet-based professional development and online testing programs (Technology Counts, 2004). The Internet offers endless possibilities for enhancing education, and, as students are already using the Internet everyday for entertainment, it only makes sense to take education to the students online. Educators can enhance their courses by publishing syllabi, assignments and due dates online. With online courses students in isolated rural schools or in under-represented or disadvantaged populations can receive quality instruction in courses previously offered only at large schools (Joo, 1999). Because of the flexibility of the environment, opportunities to discuss writing, and programs focused on student learning, online courses can also bring out previously unseen student strengths (Hurley, 2002).

Virtual Schools

Connections to the Internet allow middle school and high school students to enroll in online courses. In 1998, Florida was the first state to offer high school students online courses. The state of Florida created the Florida Online High School and developed online courses, then expanded to include students from other states. The West Virginia Virtual School opened for enrollment in the 2001 fall semester. West Virginia Virtual School did not create its own courses, but allowed students to take courses from an approved list of vendors. The first students, three seventh grade students from Capon Bridge Middle School, enrolled in a Florida Online High School course in geometry. By the end of the semester 60 West Virginia students were enrolled in various courses. The

next semester saw hundreds of students ready to take a variety of online courses from the approved catalog (West Virginia Virtual School, 2005). During the 2003-04 school year over 1,300 West Virginia students took online courses (Goldstein, 2004).

In the fall 2002 Vision High School Academy, a virtual project-based high school was developed by five educators who wanted a charter school for home-schooled and independent-study students (Lopez, 2003). The school was based upon three beliefs: “learning occurs in communities, learning requires greater participation in communities, and participation ensures the survival and growth of communities” (p. 30). Although this virtual school had occasional face-to-face meetings most of the learning occurred online where the teacher served as a facilitator who was “in the class” to encourage the community of learners to develop and grow (Lopez).

To date, twenty-one states have established virtual schools and twelve states offer online assessments (Technology Counts, 2004). Besides providing students with access to otherwise unavailable courses, virtual schools allow school districts to offer an alternative for at-risk students who cannot function within the traditional school environment, for students who cannot attend classes because of illness, and for students who want to take additional course work along with their regular classes (Chaika, 1999). Virtual schools also provide courses for home schooled students whose parents might not have the training or skills to teach (Lopez, 2003).

Collaborative Internet Projects

Virtual learning communities exist online for students of every age. With appropriate modeling and support systems it is possible for four and five year old students to participate in virtual learning communities (Scott, 2003). Educators are using

the Internet and other multimedia tools such as streaming video, video conferencing and webcasts, to create telecollaborative projects. For many of these projects educators can either create their own project or join existing ones. Three formats for telecollaborative projects are: interpersonal exchange, information collection and analysis, and problem-solving (Canter & Associates, n.d.). All telecollaborative projects should be created in such a way that they engage students in an inquiry-based activity that involves collaboration among the students in the group. The projects should also provide higher level thinking skills of analysis, synthesis and evaluation as the students transform the information to make it relevant and authentic (Canter & Associates).

Interpersonal exchange projects focus on communication between students and their peers, experts, teachers or anyone in the world. Projects can include telementoring, e-mail pals, global classrooms and question-and-answer activities. Information collection and analysis projects focus on the students using the Internet to collect and analyze information. Other projects can include electronic publishing, virtual field trips and database creation. Problem-solving projects focus on solving problems in different ways, such as teleconferencing, simulations, and WebQuests (Harris, 2001).

A variety of tools exist for online collaborations: Internet pages, e-mail, threaded discussions and online chats. These tools allow sharing of documents, online courses and workshops, discussion groups and data collection. Using compatible systems, videoconferencing allows students to communicate in real time with teachers, students and experts at different locations (Roblyer, 2003b; Sharp, 2005). Video conferencing allows students to engage in interactive learning experiences with students in other classrooms anywhere in the world (Lever-Duffy et al., 2005).

Streaming Media

Streaming media is the real-time or on-demand distribution of audio, video and multimedia over the Internet (Reed, 2003). Using streaming video, a video file is simultaneously downloaded and viewed without leaving a file on the viewer's computer (Roblyer, 2003). Streaming technology is a new tool that allows teachers to direct students to video content that may enhance comprehension of complex concepts. Although longitudinal research needs to be conducted on video streaming and student learning, a study in three Virginia school districts showed positive feedback (Reed, 2003). Over 1,400 elementary and middle school students received instruction incorporating the Video-on-Demand Unitedstreaming application, an Internet delivery system with standards-based video content. The group taught with video-on-demand showed an average increase of 12.6% on tests when compared to the group who only received traditional instruction (Reed).

WebQuests

Developed in 1995 by San Diego State University Professor Bernie Dodge, WebQuests are inquiry-oriented activities in which most or all of the information is drawn from the Internet. A WebQuest functions as a structured, interactive, self-guided tour designed to foster higher-order thinking (International Society for Technology in Education, 2002; Sharp, 2005). According to Dodge (2002) all WebQuests need to include six components: introduction, task, process, resources, evaluation and conclusion. The introduction creates the interest for the WebQuest, assigns the students their role in the quest and gives the learning objectives for the project. The task outlines what is expected of the students and provides the steps that the students need to follow to

complete the quest. The resources consist of all the information such as websites, maps, videos, and tapes that the students may need to complete any of the tasks. The evaluation identifies how the students will be evaluated, usually a rubric. Finally, the conclusion wraps up the quest with the students discussing what they have discovered.

Smith, Draper, and Sabey (2005) found the use of WebQuests to be well documented but little empirical data were collected to verify the effect of WebQuests on learning. The researchers conducted a qualitative study to examine the use of WebQuests as a teaching tool in science and literacy methods courses. WebQuests served as a way to guide the teacher candidates through the problem-solving process and better prepared the candidates to include technology in their classrooms (Smith et al., 2005).

Student Web Pages

Web page creation enables students to communicate with those who visit the site, thereby promoting text-based communication. Wheeler, Waite, and Bromfield (2002) conducted a study to investigate the creative impact of technology in a rural primary school in southwest England. The researchers found that three key areas of social interaction, problem solving and creative cognition were combined when students created their own personal web pages. Designing the web page helped students express creativity and often led to developing skills in other areas (Wheeler et al., 2002).

Blogs and Wikis

One of the latest developments in computer-mediated communication is the blog or weblog (Huffaker, 2004). Blog (Web log or weblog), is essentially an electronic journal created as a website that is available on the Internet, and is an excellent way to fuse storytelling and educational technology. Blogs typically combine a personal journal

that can have links to other webpages with tools that allow others to post to the site. The person that keeps the blog is called a blogger and the basic activity of updating, or posting to the blog is called blogging. Postings are usually arranged in chronological order with the most recent appearing first. The blog can contain periodic postings from one writer or a community of writers, and varies in its format from bulleted lists of hyperlinks to several summaries of articles that may contain user-provided ratings and comments (Wikipedia, 2005). In March of 2003 the Oxford English Dictionary added the terms weblog, weblogging and weblogger.

Since blogs were introduced the number of software programs and blog hosting sites has grown. In order to help educators the Educational Bloggers Network website was formed. The site states that it is “a collaboration of teachers and organizations using weblogs in education; its purpose is to help educators from kindergarten through university to use the weblog technology in the teaching of writing and reading across the disciplines” (Educational Bloggers Network [eBN], n.d., Mission Statement, ¶1). Using a weblog, teachers or students can publish their writings to share with others and allow others to comment and critique. Pre-service teachers who use weblogs for reflection can draw links between theory and practice (Shoffner & Shoffner, 2005).

First created in 1995, a wiki, derived from the Hawaiian word that means quick, can refer to either a website or the software used to create the site (Wiki, 2002). Wikis are an extension of weblogs and are especially designed for group collaboration, as they allow a user to not only add content but also allow the content to be edited by others. A wiki can be used as a teaching tool by creating interactivity within the class, basically an electronic community. The idea of creating electronic communities is not new; amateur

radio allowed individuals to broadcast audio to others; and Usenet, email lists, and bulletin boards on the Internet were the first digital media. Weblogs and wikis offer the opportunity to create a virtual community and for teachers to showcase what their class is creating (Ford, 2005).

Telementoring

Various websites have been developed to tutor or mentor students. Telementoring can take on different configurations, as it can be one telementor to one student or one telementor to an entire class of students. Telementoring programs are just as varied and can be sponsored by school districts, business corporations, or higher education institutions (Nellen, 1999). From 1993 to 1996, the Milken Family Foundation analyzed California's telementoring project, Telemation, and found that teachers rated the use of telementors at 4.3 on a scale of 1 to 5 with 5 being very significant. Hewlett Packard Telementoring Program involved its workforce as telementors to schools and found that the program created a future skilled workforce. Judi Harris, project director for the Electronic Emissary Project at the University of Texas at Austin matched telementors from around the world with schools. The project was monitored and tracked by Texas graduate students who found that an online facilitator was crucial to the success of the project (Nellen).

In order to have better access to the academic tutoring required by No Child Left Behind, a \$5 million, five-year federal grant was announced in the December 8, 2004 (Trotter, 2004). The purpose of the grant is to give rural students better access to academic tutoring via the Internet. Instruction will range from 3rd to 9th grade across subjects. Each student in the project will receive a new computer for his or her home, as

well as free dial-up Internet service. Students will work with the online teacher for one hour, two or three times a week.

Virtual Tours and Interactive Websites

In the past when teachers wanted to take students on a field trip they would have to collect parent permission slips, request buses and brown bag lunches, and then make all of the arrangements for the trip. Students can now take virtual tours on the Underground Railroad, raft up the Amazon River, or drive in downtown New York City. Using the Internet teachers can take students to museums and historic places. Morrison, Moore, and Nunnaley (1999) reported on a third grade class that took a trip down the Mississippi River without leaving their classroom. The students mapped the course, budgeted their money and time, and then used e-mail to interact with people that sent them actual photos of the Mississippi River. No matter how poor or isolated students' schools may be, with an Internet connection these students can have access to the world's great libraries and museums.

Many Internet science, historical and art museum sites are rich resources for students and offer interactive pages for students to explore (Provenzo, 2002). Students can dissect a frog, fly a space shuttle, view video clips, enjoy the sounds of classical, jazz, or rock and roll music, or even drag coins into a piggy bank. For example, the National Council of Teachers of Mathematics website offers a variety of interactive games, puzzles, mazes and experiments along with the math content standards for each project.

E-mail

The Internet is a link between schools and society (Schofield & Davidson, 2003). Using e-mail, students can access experts in various fields and at any location in the world. The Internet allows teachers to take students beyond the confines of their classroom, to visually and audibly explore cultures, sights, and sounds of nations around the world. The cultural impact of the Internet on teaching and learning is yet to be fully examined (Joo, 1999). Teachers and students can become co-learners, when they share problem-based learning collectively across international boundaries (Roberts, 2004).

The exchange of e-mail can be more than a literacy experience in the form of writing and receiving letters. Using e-mail a letter writing assignment can be turned into an assignment in which students also learn about other cultures and geography (Provenzo, 2002). E-mail can be a reflective exchange of social insights and address vital world concerns (Roberts, 2004). Working together students can discuss global issues using e-mail as a two-way bridge for understanding and adding a new 'voice' to the classroom.

Online Library Resources

In recent years the traditional role of the school librarian has been transformed to a "media specialist." This media specialist along with the classroom teacher has the responsibility for helping students access information through the Internet. Several websites have been created to help school librarians. The *Internet Library for Librarians* website provides links to more than 3,000 resources, all of which are recommended and reviewed by librarians (Gu, 2002). Another popular site is the Librarians Information Online Network (LION), which focuses on the needs of P-12 school librarians. Besides

hosting collections of Internet-based resources for librarians to share, LION's goals are to foster communications among school librarians and to encourage creative use of the Internet within the school setting (Librarians Information Online Network, 2004).

The Internet has changed the library experience; now most resources are available 24/7, including holidays, and allow students to use the same resources at the same time. These cyber libraries provide access to information about any topic that one can imagine (Holzberg, 2005). Besides having photographs, drawings, and charts as do printed books, books on the Internet can have links to audio and video clips and animated illustrations. This interaction is one reason that students today prefer the online encyclopedias over hardcover ones found in most libraries.

Many libraries are also reaching out to the public by making images on their websites freely downloadable. The New York Public Library has over 250,000 images of maps, Civil War photos, illuminated medieval manuscripts and historic menus on their site (New York Public Library, 2005). The availability of primary and authentic sources from these online libraries allows students to read original documents first hand, rather than someone else's synopsis. Tally and Goldenberg (2005) investigated student performance in classrooms where teachers used primary sources to actively engage students and found students were learning skills in historical interpretation and document analysis. Kelly (2000) compared students in one section of a Western Civilization course that used online primary sources with students in another section that used printed primary sources. Students in the section which used online primary sources reread the documents more often and showed a stronger grasp of historical events in their essays.

Schools can create a digital library using a stand-alone computer, the school network or an Internet site to upload books that have passed into public domain. In 2004, the Million Book Project had more than 80,000 free eBooks digitized (Cavanaugh, 2004). These electronic books do not impact a school's budget, need not be returned, and save shelf space in the library.

Conclusion

Over one-third of the participants in the Pew Internet and American Life Project stated that the Internet played a major role in their lives (Roach, 2004). In West Virginia, the Federal E-rate program helped close the Internet access gap between poor and rich school districts. West Virginia has one of the highest Internet connected computer-to-student ratios in the nation.

According to federal statistics, three percent of the American public school classrooms were connected to the Internet in 1994 and by 2004 the number had grown to over 92% (Cavanaugh, 2004). Since most classrooms are now Internet connected the question is: How are teachers integrating the Internet into their teaching? Because the Internet can be used for a wide range of purposes in the educational setting, research on the use of the Internet is a complex task (Schofield & Davidson, 2003). Information needs to be collected on what works and why (Meyer, 2003) and where there is an optimal match between technology, students, and learning (Barbules & Callister, 2000).

Using the Internet is integral to functioning in today's society. Educators have a responsibility to prepare tomorrow's adults to use the Internet in a prudent and responsible manner. Teachers need to work within a framework of sound educational theory if they want to use technology effectively in instruction (Lever-Duffy et al., 2005).

The Internet gives teachers and students access to worldwide communication, information and ideas which can serve as catalysts to change curriculum, instruction and assessment (International Society for Technology in Education, 2000).

The value of the Internet for educational use is undeniable. The Internet is more than an online version of an encyclopedia; it is a source of authentic material, a tool for intercultural communications and a place to publish projects (Linder, 2004). Meyer (2003) found that appropriately designed Internet activities improve students' critical thinking and writing. Technology allows students to progress beyond the mere acquisition of knowledge to the application of knowledge (Hopson, Simms, & Knezek, 2002).

For learning to occur students must actively integrate new knowledge into their existing knowledge (Sunal et al., 1998). One way for this to happen is to create Internet project-based learning activities that allow students to play an active role in solving real-world problems. The Internet lends itself to problem-based learning, thereby, promoting critical thinking skills as students learn to organize, analyze, interpret, and validate data. Students who complete project-based learning activities on the Internet work at almost all levels of Bloom's Taxonomy (Thorsen, 2003).

Teachers can use technology to build cooperative group/team learning skills, which in turn builds social skills (Ennis & Mocanu, 2004). Internet projects help students to reach important educational goals and allow students to showcase their work on the Internet (Karchmer, 2000).

Tapping into the Internet as an instructional tool poses a challenge for teachers, but with support from school administrators and colleagues, teachers can learn new

strategies for using the Internet. Using the Internet as a professional and instructional tool can aid teachers in creating relevant and motivating lesson plans, bringing content experts and museum treasures into classrooms and connecting students to people and places outside of the classroom. E-mail, instant messaging and websites assist teachers in communicating with students, parents, and peers.

There is little doubt that the Internet as an educational tool for learning holds enormous potential. The key to making the Internet a successful tool in impacting student learning is the teacher. It is not the educational tool that enhances teaching and learning, rather it is how that tool is used (Lever-Duffy et al., 2005). As educators become more confident in their use of the Internet it is only natural for the Internet to be interwoven into the curriculum.

CHAPTER THREE: METHODS

This study used descriptive research, both quantitative and qualitative methods, to discover the extent to which the Internet was used by West Virginia P-12 teachers and to document examples of how teachers used the Internet. The mixed methods approach allowed the researcher to use quantitative methods to gather data on West Virginia P-12 teachers' Internet usage via an instrument entitled *West Virginia Teachers' Internet Usage Survey* (Appendix A). In this survey two specific categories of Internet use were examined: the extent to which teachers use the Internet as a professional tool and the extent to which they integrate the Internet into instructional activities within the classroom. Qualitative methods included interviews to gather anecdotal information for a more in-depth understanding of how teachers were finding, creating and using Internet resources for professional and instructional activities, thus supplementing, validating, illuminating and reinterpreting the quantitative data (Bogan & Biklen, 1998).

Population and Sample

The population for this study was all West Virginia public school teachers who teach in the P-12 environment. During the 2004-2005 school year there were 20,119 public school teachers in West Virginia (Samuels, 2005). Using a population of 20,000, a confidence level of 95%, a 50/50 proportion of population and a confidence interval of 5% shows that a sample size of 377 is adequate (Dillman, 2000). A random sample of 492 West Virginia P-12 teachers was provided by the West Virginia Department of Education.

For the qualitative portion of this study a purposeful sample was chosen from teachers who volunteered by returning the Interview Contact Information form (Appendix B), indicating that they were willing to share their experiences in finding, creating, and using Internet resources for professional and instructional activities. A purposeful sample allowed the researcher to select information-rich cases that lend importance to the purpose of the research (Patton, 1990). Deviant case sampling within the purposeful sample allowed the researcher to focus on cases that were rich in information and demonstrated outstanding successes in Internet integration. Since the researcher was not using information from the qualitative portion of the study to generalize from the sample to the population, the sample size was based on the richness of examples and not on a pre-determined quantity.

Research Questions

Research questions addressed through quantitative methods in this study are:

1. To what extent are West Virginia P-12 teachers using the Internet as a professional tool?
2. To what extent are West Virginia P-12 teachers using the Internet as an instructional tool in their classrooms?

Qualitative methods were also used to gather anecdotal information with the following goal: To describe West Virginia teachers' experiences in finding, creating and using Internet resources for professional and instructional activities.

Instrumentation

In order to identify the extent to which West Virginia P-12 teachers are using the Internet, the *West Virginia Teachers' Internet Usage Survey* (Appendix A) was

developed. Part I of the survey contained questions addressing how teachers are incorporating and using the Internet as a professional tool and as an instructional tool in their classrooms. Questions for Part I, Section A were developed from the review of literature that indicated how educators use the Internet as a professional tool. Since past studies have noted that teachers mainly use the Internet for finding lesson plans and supplemental information for their lessons, this survey went into greater depth and asked questions about professional use, such as communicating with parents and colleagues, creating Web pages and participating in educational online discussions or chat rooms.

Questions for Part I, Section B were developed from the review of literature that indicated how teachers are integrating the Internet into their classroom as an instructional tool. Teachers were asked questions as to whether their students published multimedia projects on the Internet, used WebQuests, accessed interactive websites, communicated with experts, and other innovative activities.

Part II of the survey included demographic questions about the teachers' gender, age, teaching experience, grade levels and subject(s) taught, Internet training, Internet access at home and school, amount of professional development, if they have taken an online course, if they assigned homework that required Internet use, what they saw as the greatest barrier to using the Internet in their classroom and their school's percentage of students on free or reduced lunch.

For the qualitative section of this study a select number of teachers were asked to share their experiences in integrating the Internet into their classroom by participating in an interview session with the researcher. Qualitative research is descriptive in nature as it takes the form of words rather than numbers (Bogdan & Biklen, 1998), thus providing a

rich description of the social world that is being studied (Denzin & Lincoln, 1998) and “capturing people’s personal perspectives and experiences” (Patton, 1990, p. 40). The respondents’ interviews in this study deepened the understanding of how the teachers were using the Internet and provided anecdotal information.

Instrument Validity

In order to determine appropriateness and to establish content validity of the *West Virginia Teachers’ Internet Usage Survey (Survey)*, a panel of experts (Appendix D) conducted a critical systematic review of the *Survey* (Charles & Mertler, 2002; Fowler, 2002). The panel was composed of professionals in the field of educational technology from the West Virginia Department of Education, Regional Education Service Areas, West Virginia universities and West Virginia county technology coordinators. Through checking for misinterpretations and structure and noting any omissions or mistakes that may have been made in the *Survey*, the panel of experts looked at the reliability of the *Survey*, thus ensuring that the data collected would answer the related research questions (Babbie, 1990; Charles & Mertler, 2002; Gay & Airasian, 2000). To help identify problems, the panel was given a set of question characteristics (Dillman, 2000). According to Fowler (2002) using a set of question characteristics can help identify issues that need to be addressed before the pilot study. Questions for the panel of experts are included in Appendix E.

A pilot study of the survey instrument was conducted with a group of West Virginia teachers who were excluded from the sample. The purpose of the pilot study was to identify any problems with the clarity of questions and the format of the *Survey*, thereby ensuring the creation of useful data (Gay & Airasian, 2000). Babbie (1990) states

that the “best method of ensuring valid interrelationships is to conduct a pilot study” (p. 225), which should be a walk through of the final survey completed by a sample representing the target population.

Data Collection Procedures

An application for the Approval of Investigation Involving Human Subjects was submitted to the Marshall University Institutional Review Board (IRB). A copy of the approval letter is attached in Appendix F. Data collection did not occur until approval was granted by the IRB. The West Virginia Department of Education was contacted and asked to provide a systematic random sample of teachers’ (participants’) from their database.

A survey packet containing the *West Virginia Teachers’ Internet Usage Survey*, a preaddressed stamped envelope, an Interview Contact Information form and a cover letter (Appendix G) was mailed to each participant. The cover letter described the study, explained the purpose of the survey and insured confidentiality.

In order to identify nonrespondents the surveys were coded. After two weeks, nonrespondents were mailed a reminder postcard (Appendix H) asking for their assistance. After four weeks, remaining nonrespondents were mailed another survey packet with a new cover letter (Appendix I). No additional correspondence was mailed after the fourth week as research has found that further contact does not significantly increase the response rate (Dillman, 2000).

The Interview Contact Information form was completed by teachers who volunteered to participate in an interview to discuss ways in which they were using the Internet as a professional or instructional tool. Interviews were conducted with a select

number of participants who mailed back the Interview Contact Information form. The interviews with West Virginia teachers provided a deeper, more contextual picture than responses to the broad survey questions could convey (Bogdan & Biklen, 1998; Denzin & Lincoln, 1998). In order to make the interviews systematic and comprehensive an interview guide (Appendix J) was used to clearly address those issues that the researcher wished to focus upon (Patton, 1990). The guide consisted of a list of questions that were discussed during the interview. These questions were very broad in nature and allowed the interviewer to establish a focused conversational style interview. The last question was an open ended question that asked participants if there was anything else about Internet integration that they would like to add. The open ended question allowed participants to “select from among that person’s full repertoire of possible responses” (p. 296) for the purpose of adding new insight that the researcher had not thought to include. Phone interviews were recorded with permission of the interviewed teacher and the researcher took notes of major points and key words. The recordings were transcribed with the answers compiled and reported in a narrative form. Three respondents indicated on the Interview Contact Information form that they would rather be interviewed through email and were emailed the questions.

Data Analysis Procedures

Responses to items on the *West Virginia Teachers’ Internet Usage Survey* were numbered, coded and entered into the Statistical Program for Social Sciences® (SPSS version 14.0) data analysis software program. Once the data were entered into the SPSS software program, frequency distributions, means, ANOVA and other appropriate statistics were used to analyze the data.

The qualitative section of the study was a description of teachers' experiences in finding, creating, and using Internet resources for professional and instructional activities. Using the interview guide approach, the data collected were to some extent systematic for each respondent (Patton, 1990) and themes, issues and recurring patterns of Internet usage were organized (Denzin & Lincoln, 1998). Methods, phrases or words that were similar were grouped in the same category enabling the data to be presented using a cross-case analysis with answers from different participants grouped together to form a central theme (Patton). Denzin and Lincoln (1998) state that cross-case analysis "extends external validity" (p.193).

Qualitative researchers describe validity in terms of vigor, credibility and trustworthiness (Denzin & Lincoln, 1998; Patton, 1990). In this study the researcher used triangulation and member checks to ensure the trustworthiness of the study. Triangulation contributes to the verification and validation of qualitative analysis (Patton, 1990). Triangulation between the participants' surveys and interview answers was conducted. Member checks were used to verify the trustworthiness of the researcher's interpretations of interviews. During a member check participants were asked to verify that transcribed information accurately reflected their ideas and Internet integration strategies (Farell et al., 2002). Chapter 4 provides a detailed presentation and analysis of findings from the study.

CHAPTER FOUR: PRESENTATION AND ANALYSIS OF DATA

Introduction

This study examined the extent to which West Virginia P-12 teachers are using the Internet as a professional and instructional tool. Research was both quantitative and qualitative in nature, using a researcher-designed instrument and conducting in-depth interviews. Based on an in-depth review of the literature, the instrument, *West Virginia Teachers' Internet Usage Survey (Survey)*, contained 10 questions on using the Internet as a professional tool and 20 questions on using the Internet as an instructional tool. Demographic questions were also asked of the participants. Participants were asked to complete the *Survey* and to volunteer for an in-depth interview. The interviews were conducted to capture teachers' experiences in finding, creating, and using Internet resources for professional and instructional activities. Participation in the survey and interview was completely voluntary. Data, demographic information, and analyses of the study are presented in this chapter.

Population and Sample

The population of this study consisted of approximately 20,000 West Virginia P-12 teachers. A random sample of 492 teachers was provided by the West Virginia Department of Education. The sample size of 492 out of a population of 20,000 yields a 95% confidence level with a 5% margin of error. Of the 492 teachers selected to participate in the study, 130 returned the *Survey* on the first mailing, representing 26% of the sample population. Postcard reminders were mailed to the 362 non-respondents, and 33 more surveys were returned. A second complete mailing of the survey packet to non-

respondents resulted in 79 additional surveys returned for a total of 242, representing a 49% total response rate. Of the 242 respondents eight returned blank surveys and one emailed a note stating that she did not return the survey because she was a Preschool Specialist and not in the classroom.

Twenty-two respondents returned the Interview Contact Information form, with three indicating they would prefer to be interviewed by email. The demographics of those volunteering for an in-depth interview were reviewed and divided into a matrix (Appendix K) of 12 groups based on years of teaching experience (1-10, 11-25, and 25+) and grade levels taught (P-2, 3-5, 6-8, and 9-12). The researcher was able to interview at least one respondent in nine of the twelve groups. A total of fourteen respondents were interviewed, eleven by phone and three by email. The distribution of interviewees was similar in gender, age, and years teaching experience when compared to the overall sample of participants in the study.

Survey Data

Part I of the *Survey* was divided into two sections. Section A dealt with the extent to which teachers use the Internet as a professional tool, and Section B dealt with the extent to which teachers use the Internet as an instructional tool. A Likert scale was used to record the extent of Internet Use. The rating scale was as follows: 6 = “Daily”, 5 = “Weekly”, 4 = “Monthly”, 3 = “Quarterly”, 2 = “Yearly” and 1 = “Don’t Know/Use”. This scale was merged into four categories for ease of interpretation and discussion. Daily and Weekly ratings were merged to create a rating of “High Use”. The Monthly rating was changed to “Moderate Use”. Quarterly and Yearly ratings were merged to create a rating of “Low Use”. The Don’t Know/Use rating remained the same.

Data were analyzed using the Statistical Program for Social Sciences® (SPSS version 14.0). Descriptive statistics were calculated for each of the 30 questions on the *Survey*. To answer research question one, “To what extent are West Virginia P-12 teachers using the Internet as a professional tool?” a mean for each of the 10 questions in Section A was calculated. To answer research question two, “To what extent are West Virginia teachers using the Internet as an instructional tool?” a mean for each of the 20 questions in Section B was calculated.

Qualitative analysis of the interviews was used to find West Virginia P-12 teachers’ experiences in finding, creating, and using Internet resources for professional and instructional activities. Qualitative data and analysis from the interviews are presented where applicable. The following illustrate the findings of this research.

Internet as a Professional Tool

Based on a review of literature, Part I, Section A of the *Survey* included ten questions regarding the extent to which P-12 teachers use the Internet as a professional tool. The following ten questions were preceded by “As a Professional tool, I use the Internet to:”

- Find lesson plans
- Find supplemental information for lessons
- Post lecture notes or assignments
- Create or update class or school Web page(s)
- Communicate with parents
- Communicate with students
- Communicate with experts/teachers

- Participate in educational online discussions
- Participate in educational online chat rooms
- Instant message in an educational environment

This section will report the quantitative findings for each of the ten professional tool questions as well as qualitative analysis of interviews regarding professional activities when applicable. During interviews teachers provided examples related to the following professional activities: find lesson plans, find supplemental material for lessons, and instant message in an educational environment.

Find Lesson Plans

Participants were asked to what extent they use the Internet to find lesson plans by indicating a response option that best described their current usage. Using the values assigned to each response, descriptive statistics were calculated. The number of participants responding to the question, the mean (M), and standard deviation (SD) are displayed in Table 1. With 232 respondents, find lesson plans had a mean of 3.34 and a standard deviation of 1.447. The mean of 3.34 for this question indicates that teachers on an average use the Internet Quarterly to Monthly to find lesson plans.

Table 1 Descriptive Data: Find lesson plans

Question	Number of Respondents	M	SD
Find lesson plans	232	3.34	1.447

Merged response options for “find lesson plans” are shown in Figure 1. Based on merged categories 54 respondents (23.4%) reported High Use of the Internet to “find lesson plans”, 72 respondents (31.2%) reported Moderate Use, 63 respondents (27.3%) reported Low Use, and 42 respondents (18.2%) indicated Don’t Know/Use the Internet to

find lesson plans. The largest single number of responses (72 or 31.2%) was found within “Moderate Use.”

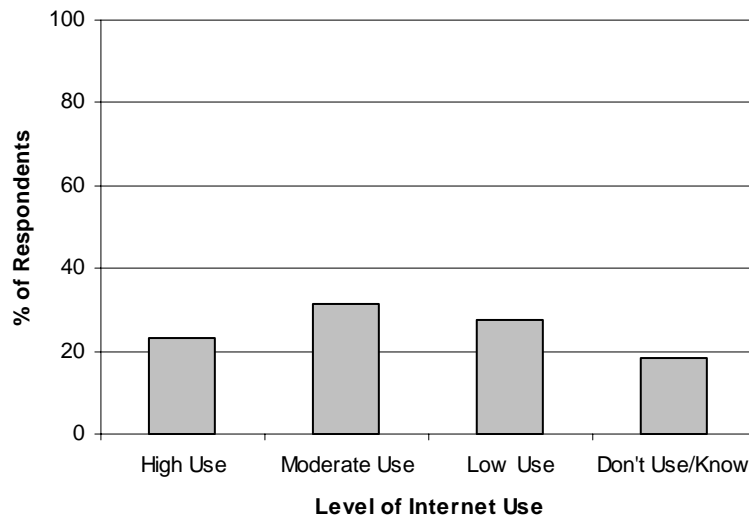


Figure 1 Professional Tool: Find lesson plans

The interviewed teachers on an average used the Internet Weekly to Monthly to “find lesson plans.” In interviewing teachers, the researcher found that teachers were using a variety of sites to find lesson plans. Teachers mentioned using Google or Ask to find multiple subject lesson plans. For specific subjects teachers used Discovery.com for science lessons and the Historychannel.com for social studies lessons. Teachers indicated that they spent between 10 to 30 minutes a day looking for lesson plans on the Internet. A 9th grade business teacher stated that she was “constantly looking on sites for new lesson plans or just to get a different approach on one, or how to adapt one for my class - something that I could use to help my kids understand.”

Teachers also indicated that they realize lesson plans off the Internet do not always dovetail to their specific needs, resources, or content standards so they expect to make modifications. A Pre-K teacher remarked that she would “take a lesson plan [from the Internet] and adapt it to fit my students’ level and the resources we have to

accomplish the lesson. Lesson plans from the Internet usually hit language, science and math as a whole.”

Find Supplemental Information for Lessons

Participants were asked to what extent they use the Internet to find supplemental information for lessons by indicating a response option that best described their current usage. Using the values assigned to each response, descriptive statistics were calculated. The number of participants responding to the question, the mean, and standard deviation are displayed in Table 2. With 232 respondents, find supplemental information for lessons had a mean of 4.14 and a standard deviation of 1.270. The mean of 4.14 for this question indicates that teachers on an average use the Internet between Monthly to Weekly to find supplemental information for lessons.

Table 2 Descriptive Data: Find supplemental information for lessons

Question	Number of Respondents	M	SD
Find supplemental material for lessons	232	4.14	1.270

Merged response options for “find supplemental information for lessons” are displayed in Figure 2. Based on merged categories 104 respondents (44.8%) reported High Use of the Internet to find supplemental information for lessons, 73 respondents (31.5%) reported Moderate Use, 39 respondents (16.8%) reported Low Use, and 16 respondents (3.9%) indicated Don’t Know/Use the Internet to find supplemental information for lessons. The largest single number of responses (104 or 44.8%) was found within “High Use.”

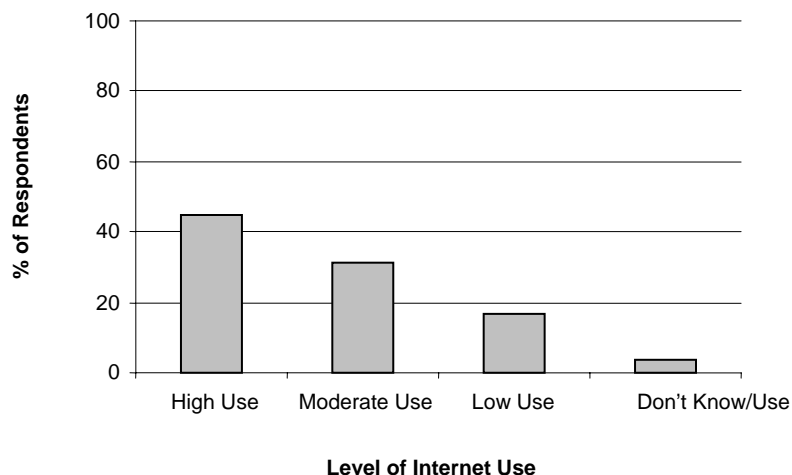


Figure 2 Professional Tool: Find supplemental information for lessons

The interviewed teachers on average used the Internet Weekly to “find supplemental materials for lessons.” Several of the teachers stated that they use the Internet to find pictures or video clips to place in a PowerPoint to use for class lectures and discussions. A 6th grade teacher created a PowerPoint with hyperlinks to Internet websites to show pictures, audio clips, and/or video clips. When he taught 8th grade social studies he spent 5 to 10 hours creating a PowerPoint that he used for an entire week’s lesson. When he taught lessons on WWI and WWII he used the British Broadcasting site because the site had lesson plans, pictures, and video/audio clips.

Teachers also found the Internet to be a quick resource for adding emphasis to selected objectives and gaining additional points of view. An elementary physical education teacher who had planning time at the beginning of each day stated that he spends an average of 10 minutes each morning searching for different types of physical education activities for his students. He liked using the Internet because “instead of getting ideas from one author or one text there are multiple resources that I can go to more quickly.”

An elementary special education teacher used the Internet to find photo resources for her students. She stated that special needs students require many experiences with sorting or matching to assimilate ideas, such as: a house could be a building other than the one in which the student lived, or a cat can be more than one color. In less than two hours this teacher found and printed all photos that she needed for a sorting and matching project. She liked getting the photos from the Internet because she could size the photos to be the same size, store them on her hard drive and replicate the photos for other activities or replace photos that may have been lost or worn through use.

Post Lecture Notes or Assignments

Participants were asked to what extent they use the Internet to post lecture notes or assignments by indicating a response option that best described their current usage. Using the values assigned to each response, descriptive statistics were calculated. The number of participants responding to the question, the mean, and standard deviation are displayed in Table 3. With 232 respondents, post lecture notes or assignments had a mean of 1.84 and a standard deviation of 1.559. The mean of 1.84 for this question indicates that teachers on an average use the Internet less than Yearly to post lecture notes or assignments.

Table 3 Descriptive Data: Post lecture notes or assignments

Question	Number of Respondents	M	SD
Post lecture notes or assignments	232	1.84	1.559

Merged response options for “post lecture notes or assignments” are displayed in Figure 3. Based on merged categories 30 respondents (12.9%) reported High Use of the Internet to post lecture notes or assignments, 15 respondents (6.5%) reported Moderate

Use, 14 respondents (6%) reported Low Use, and 173 respondents (74.6%) indicated Don't Know/Use the Internet to post lecture notes or assignments. The largest single number of responses (173 or 74.68%) was found within "Don't Know/Use."

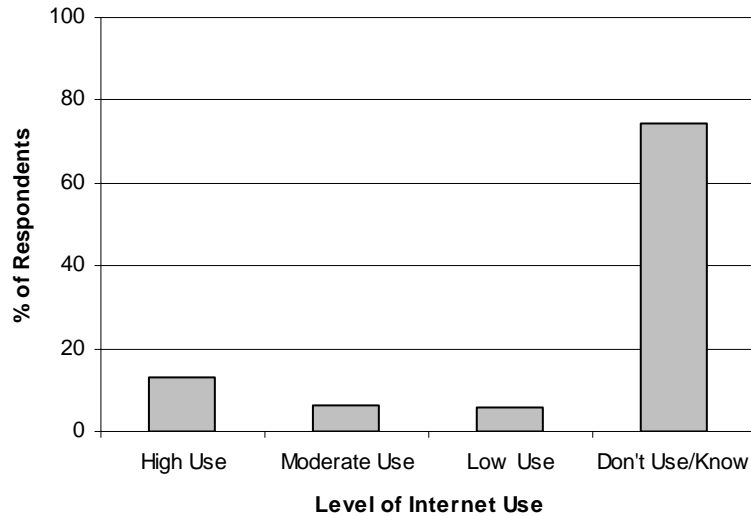


Figure 3 Professional Tool: Post lecture notes or assignments

Create or Update Class or School Web Page(s)

Participants were asked to what extent they use the Internet to create or update class or school Web page(s) by indicating a response option that best described their current usage. Using the values assigned to each response, descriptive statistics were calculated. The number of participants responding to the question, the mean, and standard deviation are displayed in Table 4. With 229 respondents, create or update class or school Web page(s) had a mean of 1.76 and a standard deviation of 1.421. The mean of 1.76 for this question indicates that teachers on an average use the Internet less than Yearly to create or update class or school Web page(s).

Table 4 Descriptive Data: Create or update class or school Web page(s)

Question	Number of Respondents	M	SD
Create or update class or school Web page(s)	229	1.76	1.421

Merged response options for “create or update class or school Web page(s)” are displayed in Figure 4. Based on merged categories 23 respondents (10.1%) reported High Use of the Internet to create or update class or school Web page(s), 13 respondents (5.7%) reported Moderate Use, 25 respondents (10.9%) reported Low Use, and 168 respondents (73.4%) indicated Don’t Know/Use the Internet to create or update class or school Web page(s). The largest single number of responses (168 or 73.4%) was found within “Don’t Know/Use.”

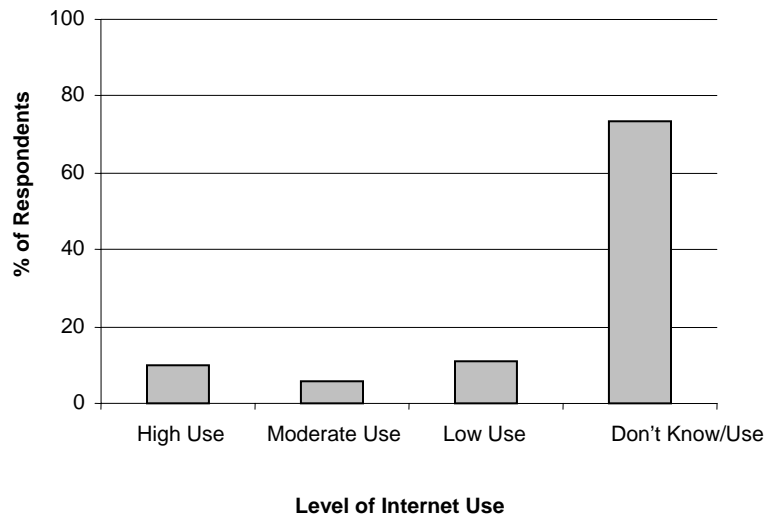


Figure 4 Professional Tool: Create or update class or school Web page(s)

Communicate with Parents

Participants were asked to what extent they use the Internet to communicate with parents by indicating a response option that best described their current usage. Using the values assigned to each response, descriptive statistics were calculated. The number of

participants responding to the question, the mean, and standard deviation are displayed in Table 5. With 230 respondents, communicate with parents had a mean of 2.30 and a standard deviation of 1.769. The mean of 2.30 for this question indicates that teachers on an average use the Internet Yearly to Quarterly to communicate with parents.

Table 5 Descriptive Data: Communicate with parents

Question	Number of Respondents	M	SD
Communicate with parents	230	2.30	1.769

Merged response options for “communicate with parents” are displayed in Figure 5. Based on merged categories 48 respondents (20.9%) reported High Use of the Internet to communicate with parents, 22 respondents (9.6%) reported Moderate Use, 19 respondents (8.3%) reported Low Use, and 141 respondents (61.3%) indicated Don’t Know/Use the Internet to communicate with parents. The largest single number of responses (141 or 61.3%) was found within “Don’t Know/Use.”

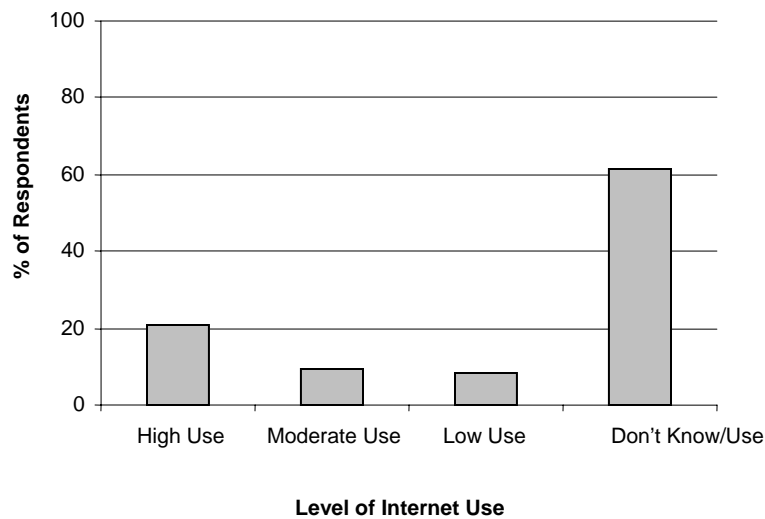


Figure 5 Professional Tool: Communicate with parents

Communicate with Students

Participants were asked to what extent they use the Internet to communicate with students by indicating a response option that best described their current usage. Using the values assigned to each response, descriptive statistics were calculated. The number of participants responding to the question, the mean, and standard deviation are displayed in Table 6. With 231 respondents, communicate with students had a mean of 2.07 and a standard deviation of 1.713. The mean of 2.07 for this question indicates that teachers on an average use the Internet Yearly to communicate with students.

Table 6 Descriptive Data: Communicate with students

Question	Number of Respondents	M	SD
Communicate with students	231	2.07	1.713

Merged response options for “communicate with students” are displayed in Figure 6. Based on merged categories 38 respondents (16.4%) reported High Use of the Internet to communicate with students, 18 respondents (7.8%) reported Moderate Use, 16 respondents (6.9%) reported Low Use, and 159 respondents (68.8%) indicated Don’t Know/Use the Internet to communicate with students. The largest single number of responses (159 or 68.8%) was found within “Don’t Know/Use.”

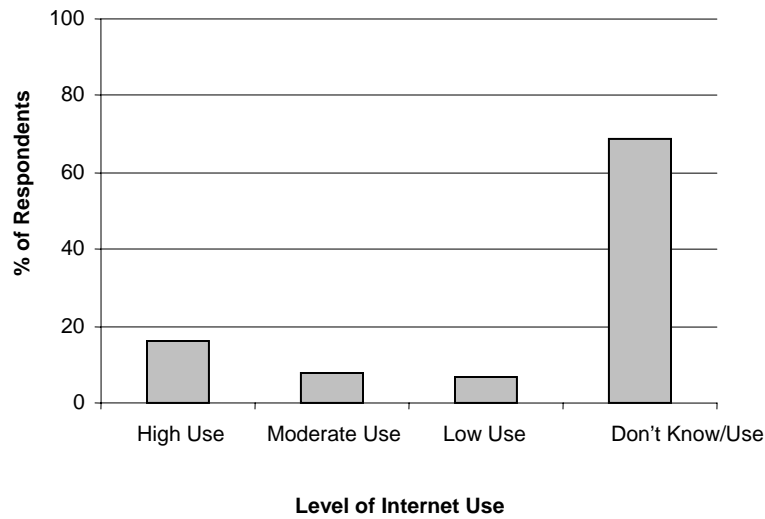


Figure 6 Professional Tool: Communicate with students

Communicate with Experts/Teachers

Participants were asked to what extent they use the Internet to communicate with experts/teachers by indicating a response option that best described their current usage. Using the values assigned to each response, descriptive statistics were calculated. The number of participants responding to the question, the mean, and standard deviation are displayed in Table 7. With 230 respondents, communicate with experts/teachers had a mean of 3.13 and a standard deviation of 1.942. The mean of 3.13 for this question indicates that teachers on an average use the Internet Quarterly to communicate with experts/teachers.

Table 7 Descriptive Data: Communicate with experts/teachers

Question	Number of Respondents	M	SD
Communicate with parents	230	3.13	1.942

Merged response options for “communicate with experts/teachers” are displayed in Figure 7. Based on merged categories 78 respondents (33.9%) reported High Use of

the Internet to communicate with experts/teachers, 32 respondents (13.9%) reported Moderate Use, 31 respondents (13.5%) reported Low Use, and 89 respondents (38.7%) indicated Don't Know/Use the Internet to communicate with experts/teachers. The largest single number of responses (89 or 38.7%) was found within "Don't Know/Use."

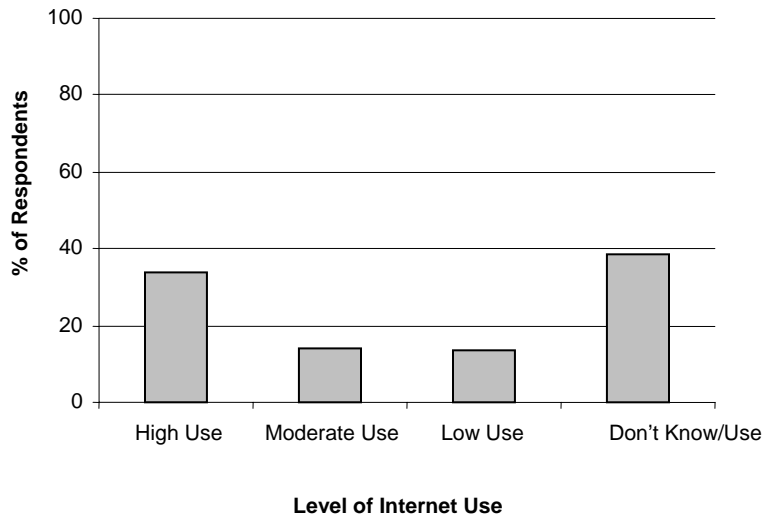


Figure 7 Professional Tool: Communicate with experts/teachers

Participate in Educational Online Discussions

Participants were asked to what extent they use the Internet to participate in educational online discussions by indicating a response option that best described their current usage. Using the values assigned to each response descriptive statistics were calculated. The number of participants responding to the question, the mean, and standard deviation are displayed in Table 8. With 231 respondents, participate in educational online discussions had a mean of 1.62 and a standard deviation of 1.273. The mean of 1.62 for this question indicates that teachers on an average use the Internet less than Yearly to participate in educational online discussions.

Table 8 Descriptive Data: Participate in educational online discussions

Question	Number of Respondents	M	SD
Participate in educational online discussions	231	1.62	1.273

Merged response options for “participate in educational online discussions” are displayed in Figure 8. Based on merged categories 17 respondents (7.3%) reported High Use of the Internet to participate in educational online discussions, 9 respondents (3.9%) reported Moderate Use, 30 respondents (13%) reported Low Use, and 175 respondents (75.8%) indicated Don’t Know/Use the Internet to participate in educational online discussions. The largest single number of responses (175 or 75.8%) was found within “Don’t Know/Use”.

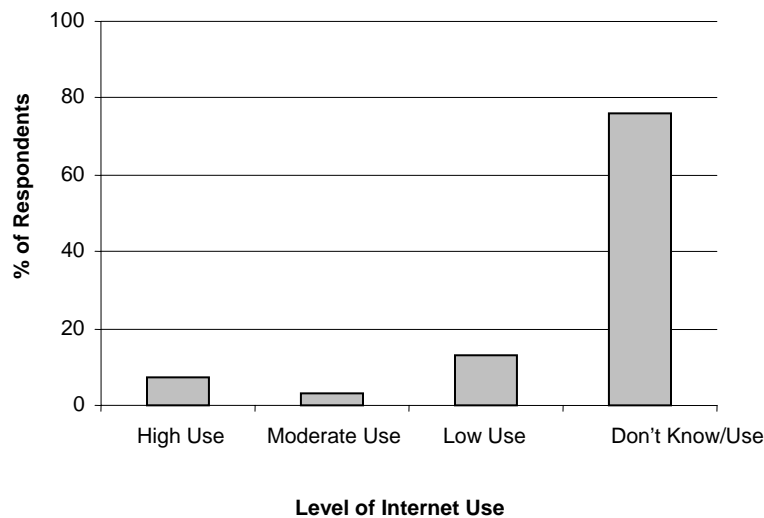


Figure 8 Professional Tool: Participate in educational online discussions

Participate in Educational Online Chat Rooms

Participants were asked to what extent they use the Internet to participate in educational online chat rooms by indicating a response option that best described their current usage. Using the values assigned to each response, descriptive statistics were

calculated. The number of participants responding to the question, the mean, and standard deviation are displayed in Table 9. With 232 respondents, participate in educational online chat rooms had a mean of 1.25 and a standard deviation of 0.892. The mean of 1.25 for this question indicates that teachers on an average use the Internet less than Yearly to participate in educational online chat rooms.

Table 9 Descriptive Data: Participate in educational online chat rooms

Question	Number of Respondents	M	SD
Participate in educational online chat rooms	232	1.25	0.892

Merged response options for “participate in educational online chat rooms” are displayed in Figure 9. Based on merged categories 7 respondents (3%) reported High Use of the Internet to participate in educational online chat rooms, 5 respondents (2.2%) reported Moderate Use, 12 respondents (5.1%) reported Low Use, and 208 respondents (89.7%) indicated Don’t Know/Use the Internet to participate in educational online chat rooms. The largest single number of responses (208 or 89.7%) was found within “Don’t Know/0Use”.

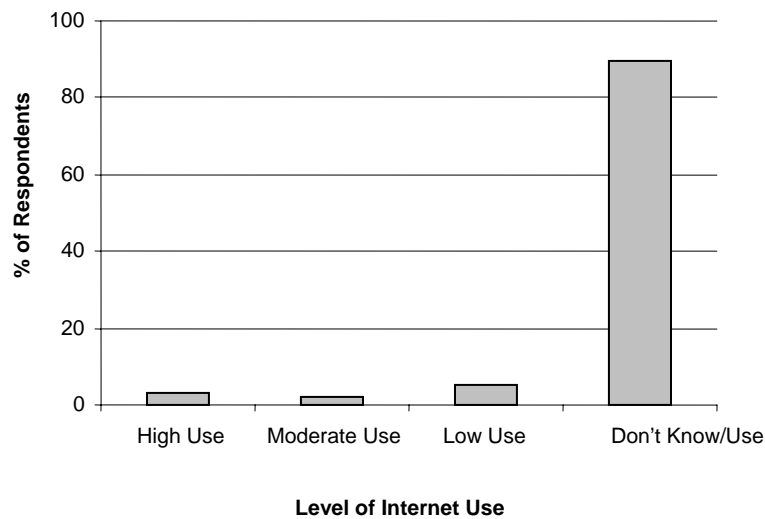


Figure 9 Professional Tool: Participate in educational online chat rooms

Instant Message in an Educational Environment

Participants were asked to what extent they use the Internet to instant message in an educational environment by indicating a response option that best described their current usage. Using the values assigned to each response, descriptive statistics were calculated. The number of participants responding to the question, the mean, and standard deviation are displayed in Table 10. With 231 respondents, instant message in an educational environment had a mean of 1.67 and a standard deviation of 1.494. The mean of 1.67 for this question indicates that teachers on an average use the Internet less than Yearly to instant message in an educational environment.

Table 10 Descriptive Data: Instant message in an educational environment

Question	Number of Respondents	M	SD
Instant message in an educational environment	231	1.67	1.494

Merged response options for “instant message in an educational environment” are displayed in Figure 10. Based on merged categories 24 respondents (10.4%) reported

High Use of the Internet to instant message in an educational environment, 8 respondents (3.5%) reported Moderate Use, 13 respondents (5.6%) reported Low Use, and 186 respondents (80.5%) indicated Don't Know/Use the Internet to instant message in an educational environment. The largest single number of responses (186 or 80.5%) was found within "Don't Know/Use".

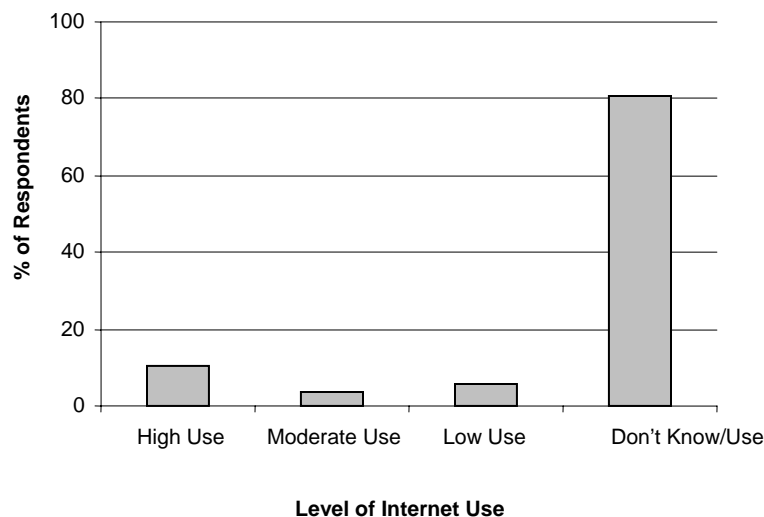


Figure 10 Professional Tool: Instant message in an educational environment

The interviewed teachers on an average used the Internet between Quarterly and Yearly to “instant message in an educational environment.” A 4th grade teacher commented that a group of teachers at her school decided to use instant messaging to keep track of students who were habitually leaving the classrooms. This teacher felt that using instant message helped the teachers to know what was going on in other classrooms and in the school.

Summary of the Extent of Professional Use

To find the extent to which teachers are using the Internet as a professional tool, participants were asked to check one response option that best described their current

Internet usage for each of the 10 questions. In Table 11, the 10 questions related to using the Internet as a professional tool are ranked in order from most used to least used. Data indicated that teachers used the Internet as a professional tool most frequently to find supplemental information for lessons (mean of 4.14). The lowest use of the Internet as a professional tool was participation in educational online chat rooms (mean of 1.25).

Table 11 Descriptive Data: Professional tool questions

Questions	Number of Respondents	M	SD
Find supplemental information for lessons	232	4.14	1.27
Find lesson plans	232	3.34	1.45
Communicate with experts/teachers	230	3.13	1.94
Communicate with parents	230	2.30	1.77
Communicate with students	231	2.07	1.71
Post lecture notes or assignments	232	1.84	1.56
Create or update class or school Web page(s)	229	1.76	1.42
Instant message in an educational environment	231	1.67	1.49
Participate in educational online discussions	231	1.62	1.27
Participate in educational online chat rooms	232	1.25	0.89

Teachers reported Moderate Use for finding supplemental information for lessons, and Low Use for finding lesson plans, communicating with experts and other teachers, communicating with parents, communicating with students, posting lecture notes or assignments, creating or updating class or school Web page(s), instant messaging in an educational environment, and participating in educational online discussions. Teachers reported Low Use to Don't Know/Use for participating in educational online chat rooms.

Internet as an Instructional Tool

Based on a review of the literature, Part I, Section B of the *Survey* included 20 questions regarding the extent to which teachers use the Internet as an instructional tool.

The following 20 questions were preceded by “As an Instructional tool, I have my students use the Internet to:”

- Participate in Web-based scavenger hunts
- Participate in WebQuest projects
- Communicate with content experts
- Access lecture notes or assignments
- Access online course materials
- Access an online library
- Publish multimedia projects
- Participate in virtual tours
- Utilize educational interactive websites
- Access audio and/or video clips
- Find information and/or resources
- Participate in an electronic conference
- Communicate with other students
- Access online encyclopedias or dictionaries
- Use online tutoring or homework help
- Read about current events
- Read digital books online
- Participate in a Weblog/Blog
- Participate in a Wiki
- Communicate with students from other cultures

This section will report the quantitative findings for each of the 20 instructional tool questions as well as qualitative analysis of interviews regarding instructional activities when applicable. During interviews teachers provided examples related to the following instructional activities: participate in Web-based scavenger hunts and WebQuests, communicate with experts, access online course materials, participate in virtual tours, utilize interactive Websites, and find information and/or resources.

Participate in Web-Based Scavenger Hunts

Participants were asked to what extent their students use the Internet to participate in Web-based scavenger hunts by indicating a response option that best described their current usage. Using the values assigned to each response, descriptive statistics were calculated. The number of participants responding to the question, the mean, and standard deviation are displayed in Table 12. With 228 respondents, participate in Web-based scavenger hunts had a mean of 1.69 and a standard deviation of 1.211. The mean of 1.69 for this question indicates that teachers on an average have their students use the Internet less than Yearly to participate in Web-based scavenger hunts.

Table 12 Descriptive Data: Participate in Web-based scavenger hunts

Question	Number of Respondents	M	SD
Participate in Web-based scavenger hunts	228	1.69	1.211

Merged response options for “participate in Web-based scavenger hunts” are displayed in Figure 11. Based on merged categories 10 respondents (4.3%) reported High Use of the Internet to participate in Web-based scavenger hunts, 20 respondents (8.8%) reported Moderate Use, 38 respondents (16.7%) reported Low Use, and 160 respondents (70.2%) indicated Don’t Know/Use the Internet to participate in Web-based scavenger

hunts. The largest single number of responses (160 or 70.2%) was found within “Don’t Know/Use”.

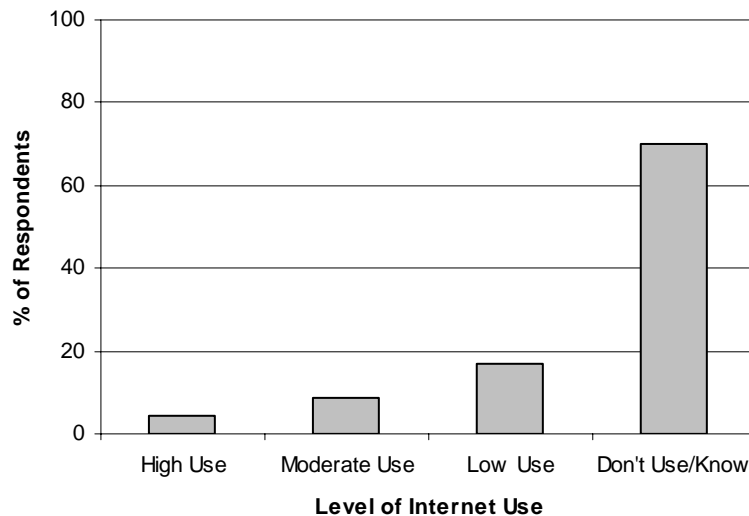


Figure 11 Instructional Tool: Participate in Web-based scavenger hunts

The interviewed teachers on an average used the Internet at least Yearly for students participation in a Web-based scavenger hunt. One high school teacher indicated that although the textbook her class used had Internet activities for almost every lesson she preferred to create her own as the textbook had mainly open research questions, where students were to spend time looking for various companies and persons. The teacher preferred to list websites for students in order to facilitate completion of the hunt during the class time and to eliminate students accessing inappropriate sites. Teachers felt that students enjoyed going to the computer lab to participate in hands-on activity. One teacher stated that she used Web-based scavenger hunts to “add variety to my teaching strategies.”

A high school marketing teacher used Web-based scavenger hunts to teach her students research methods needed for college. This teacher created her own Web-based

hunts by going to company, magazine or city Websites and making up questions that pertained to the sites. Websites that she used included: classroom edition of the Wall Street Journal, Proctor and Gamble, Fed Ex, Fast Company, Kroger, and the Food Network.

The marketing teacher also integrated several resources with an online scavenger hunt about the distribution of coffee and coffee’s product extensions. At the end of the unit the class watched a video, “Follow that Food,” from the Food Network and tasted various foods. The class also completed a scavenger hunt at Krogers’ Website where the students did unit pricing, package analysis, placement research, and competitive analysis. The teacher stated that doing this unit helped to relate marketing to students’ everyday lives.

Participate in WebQuest Projects

Participants were asked to what extent their students use the Internet to participate in WebQuest projects by indicating a response option that best described their current usage. Using the values assigned to each response, descriptive statistics were calculated. The number of participants responding to the question, the mean, and standard deviation are displayed in Table 13. With 228 respondents, participate in WebQuest projects had a mean of 1.54 and a standard deviation of 1.059. The mean of 1.54 for this question indicates that on average teachers have their students use the Internet less than Yearly to participate in WebQuest projects.

Table 13 Descriptive Data: Participate in WebQuest projects

Question	Number of Respondents	M	SD
Participate in WebQuest projects	228	1.54	1.059

Merged response options for “participate in WebQuest projects” are displayed in Figure 12. Based on merged categories 4 respondents (1.7%) reported High Use of the Internet to participate in WebQuest projects, 16 respondents (7%) reported Moderate Use, 36 respondents (15.8%) reported Low Use, and 172 respondents (75.4%) indicated Don’t Know/Use the Internet to participate in WebQuest projects. The largest single number of responses (172 or 75.4%) was found within “Don’t Know/Use.”

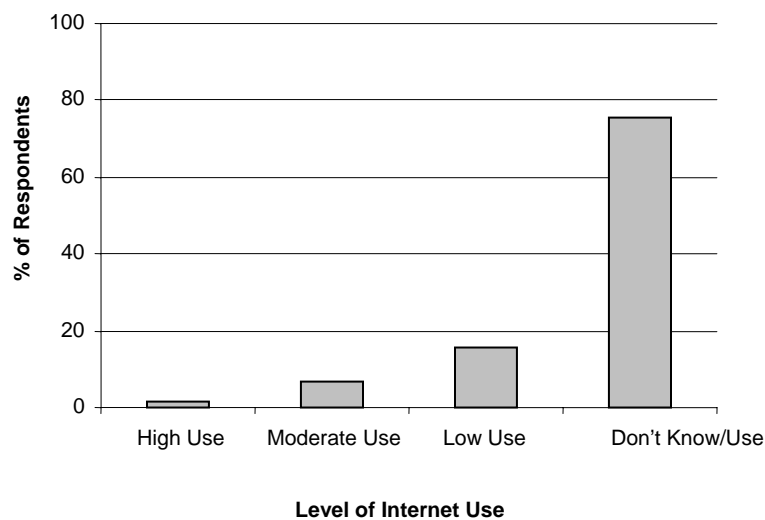


Figure 12 Instructional Tool: Participate in WebQuest projects

The interviewed teachers on an average used the Internet at least Yearly to participate in WebQuest projects. One high school Spanish teacher found that her students “just love when we have to go to the computer lab.” Last year her class participated in the Cinco de Mayo Quest. This teacher thought that her students learned more from the WebQuest than they could from the traditional Spanish textbook. The Spanish teacher also stated that creating a WebQuest was a large undertaking and a time consuming project. She started creating a WebQuest last year on the different countries in South America and hopes to finish it over the summer break. The teacher felt that she

was learning along with the students as she was discovering new information about South American countries, for example, the fact that Chile has penguins. She stated that information on foods of different countries was not found in her textbooks and that the Internet has the most current information on what is happening in different countries.

Communicate with Content Experts

Participants were asked to what extent their students use the Internet to communicate with content experts by indicating a response option that best described their current usage. Using the values assigned to each response descriptive statistics were calculated. The number of participants responding to the question, the mean, and standard deviation are displayed in Table 14. With 228 respondents, communicate with content experts had a mean of 1.69 and a standard deviation of 1.332. The mean of 1.69 for this question indicates that teachers on an average have their students use the Internet less than Yearly to communicate with content experts.

Table 14 Descriptive Data: Communicate with content experts

Question	Number of Respondents	M	SD
Communicate with content experts	228	1.69	1.332

Merged response options for “communicate with content experts” are displayed in Figure 13. Based on merged categories 15 respondents (6.6%) reported High Use of the Internet to communicate with content experts, 16 respondents (7%) reported Moderate Use, 25 respondents (10.9%) reported Low Use, and 172 respondents (75.4%) indicated Don’t Know/Use the Internet to communicate with content experts. The largest single number of responses (172 or 75.4%) was found within “Don’t Know/Use.”

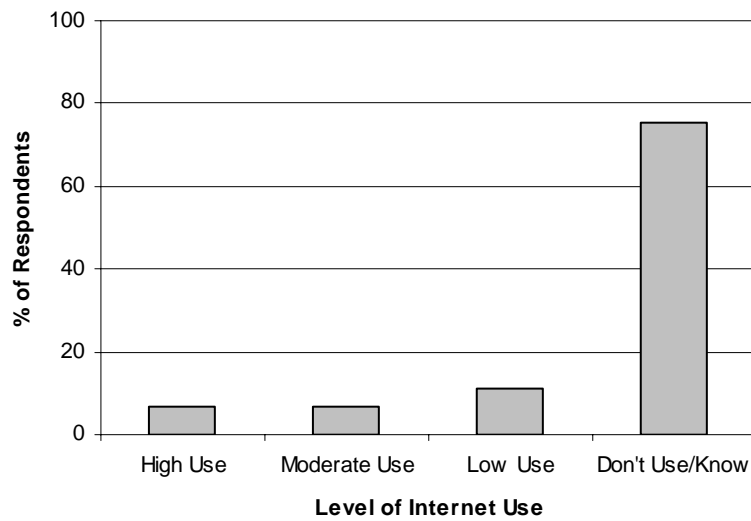


Figure 13 Instructional Tool: Communicate with content experts

The interviewed teachers on an average used the Internet Yearly to have their students communicate with content experts. One 7th grade English and reading teacher used the Internet to find authors who are giving interviews online. Scholastic Books Company sent out a schedule of dates and times authors would be giving interactive interviews. When there was an interview with an author of one of the books the students were reading, the teacher emailed Scholastic Books to receive a confirmation number.

The confirmation number allowed the teacher’s class to email the author questions before and during the interview. When the computer lab was available the teacher would take the class there to watch the interview and email questions. Other times the teacher used an Internet connected computer with a data projector for the students to watch the interview and listen to the author answer questions from other students. The teacher stated that, “They [students] enjoyed it. I think that it made the book more interesting to them, after seeing the author. They go, hey, there is a real person who wrote this book.”

Access Lecture Notes or Assignments

Participants were asked to what extent their students use the Internet to access lecture notes or assignments by indicating a response option that best described their current usage. Using the values assigned to each response, descriptive statistics were calculated. The number of participants responding to the question, the mean, and standard deviation are displayed in Table 15. With 227 respondents, access lecture notes or assignments had a mean of 1.76 and a standard deviation of 1.417. The mean of 1.76 for this question indicates that teachers on an average have their students use the Internet less than Yearly to access lecture notes or assignments.

Table 15 Descriptive Data: Access lecture notes or assignments

Question	Number of Respondents	M	SD
Access lecture notes or assignments	227	1.76	1.417

Merged response options for “access lecture notes or assignments” are displayed in Figure 14. Based on merged categories 20 respondents (8.8%) reported High Use of the Internet to access lecture notes or assignments 19 respondents (8.4%) reported Moderate Use, 21 respondents (9.3%) reported Low Use, and 167 respondents (73.6%) indicated Don’t Know/Use the Internet to access lecture notes or assignments. The largest single number of responses (167 or 73.6%) was found within “Don’t Know/Use.”

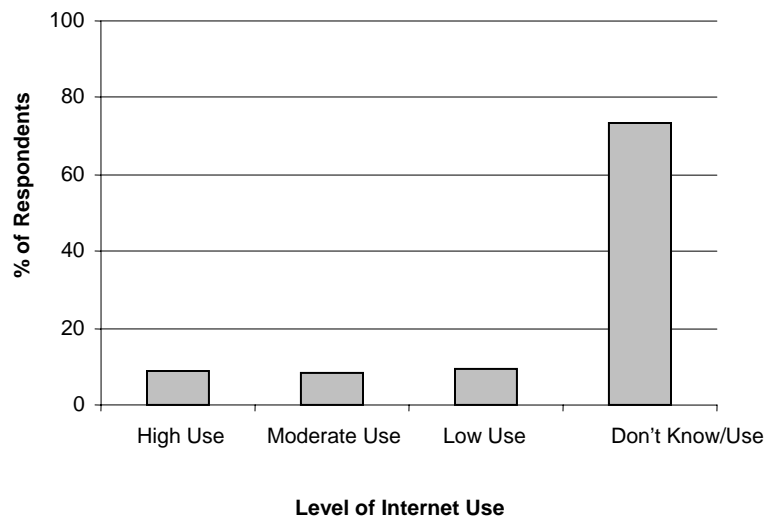


Figure 14 Instructional Tool: Access lecture notes or assignments

Access Online Course Materials

Participants were asked to what extent their students use the Internet to access online course materials by indicating a response option that best described their current usage. Using the values assigned to each response, descriptive statistics were calculated. The number of participants responding to the question, the mean, and standard deviation are displayed in Table 18. With 226 respondents, access online course materials had a mean of 2.12 and a standard deviation of 1.578. The mean of 2.12 for this question indicates that teachers on an average had their students use the Internet more than Yearly to access online course materials.

Table 16 Descriptive Data: Access online course materials

Question	Number of Respondents	M	SD
Access online course materials	226	2.12	1.578

Merged response options for “access online course materials” are displayed in Figure 15. Based on merged categories 31 respondents (13.7%) reported High Use of the

Internet to access online course materials, 22 respondents (9.7%) reported Moderate Use, 35 respondents (15.5%) reported Low Use, and 138 respondents (61.1%) indicated Don't Know/Use the Internet to access online course materials. The largest single number of responses (138 or 61.1%) was found within "Don't Know/Use."

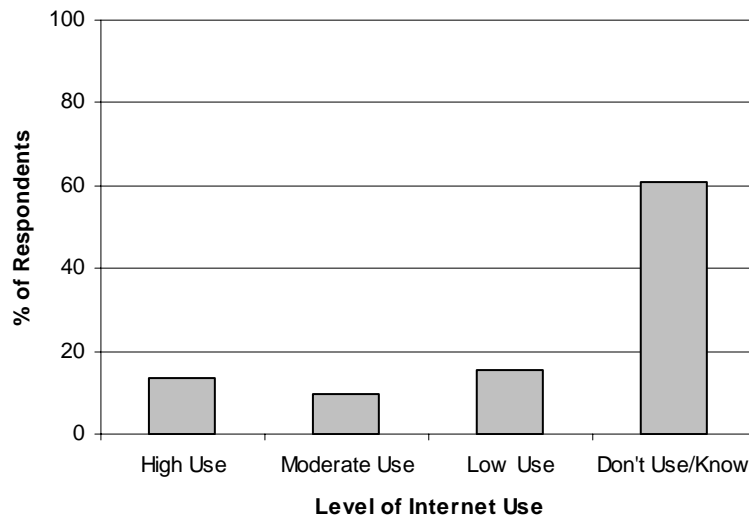


Figure 15 Instructional Tool: Access online course materials

The interviewed teachers on an average used the Internet Monthly to have their students access online course materials. The researcher found that many teachers used textbooks that include online course materials. Several teachers adapted these online materials to meet the needs of his/her students. A business teacher adapted the online lessons to match the needs of her students who live in a rural area. Another teacher had her students take chapter practice tests online and stated that "they [students] definitely learn more when they can handle it on their own, at their own pace and rhythm, they understand." The practice tests often times gave immediate feedback to the students and allowed the students to retake the tests until they had mastered the material.

A high school marketing teacher had her students complete the online “Lemonade Game”, which taught both entrepreneurship skills and economics. A middle school social studies teacher used quizzes on the History Channel Website for students to obtain extra credit points. The students completed the quiz during class time and printed their scores.

Access an Online Library

Participants were asked to what extent their students use the Internet to access an online library by indicating a response option that best described their current usage. Using the values assigned to each response, descriptive statistics were calculated. The number of participants responding to the question, the mean, and standard deviation are displayed in Table 17. With 228 respondents, access an online library had a mean of 2.41 and a standard deviation of 1.555. The mean of 2.41 for this question indicates that teachers on an average had their students use the Internet between Yearly to Quarterly to access an online library.

Table 17 Descriptive Data: Access an online library

Question	Number of Respondents	M	SD
Access an online library	228	2.41	1.555

Merged response options for “access an online library” are displayed in Figure 16. Based on merged categories 25 respondents (10.9%) reported High Use of the Internet to access an online library, 43 respondents (18.9%) reported Moderate Use, 49 respondents (21.5%) reported Low Use, and 111 respondents (48.7%) indicated Don’t Know/Use the Internet to access an online library. The largest single number of responses (111 or 48.7%) was found within “Don’t Know/Use.”

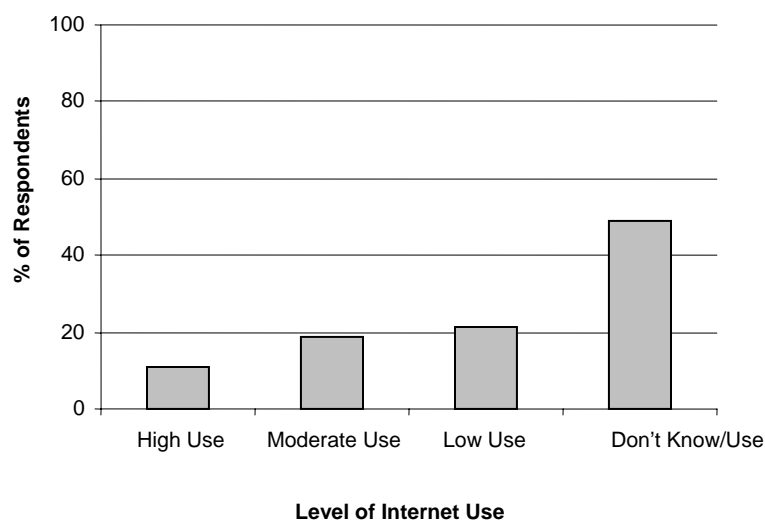


Figure 16 Instructional Tool: Assess online library

Publish Multimedia Projects

Participants were asked to what extent their students use the Internet to publish multimedia projects by indicating a response option that best described their current usage. Using the values assigned to each response, descriptive statistics were calculated. The number of participants responding to the question, the mean, and standard deviation are displayed in Table 18. With 228 respondents, publish multimedia projects had a mean of 1.48 and a standard deviation of 0.995. The mean of 1.48 for this question indicates that teachers on an average had their students use the Internet less than Yearly to publish multimedia projects.

Table 18 Descriptive Data: Publish multimedia projects

Question	Number of Respondents	M	SD
Publish multimedia projects	228	1.48	0.995

Merged response options for “publish multimedia projects” are displayed in Figure 17. Based on merged categories 4 respondents (1.8%) reported High Use of the

Internet to publish multimedia projects, 14 respondents (6.1%) reported Moderate Use, 33 respondents (14.5%) reported Low Use, and 177 respondents (77.6%) indicated Don't Know/Use the Internet to publish multimedia projects. The largest single number of responses (177 or 77.6%) was found within "Don't Know/Use."

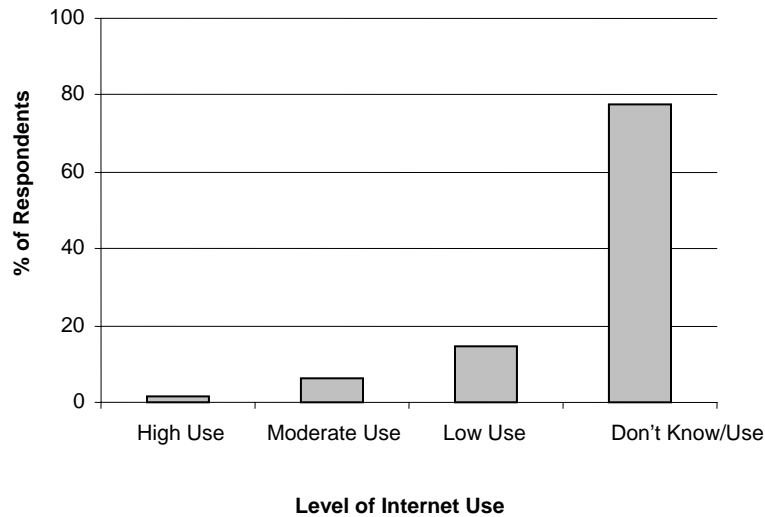


Figure 17 Instructional Tool: Publish multimedia projects

Participate in Virtual Tours

Participants were asked to what extent their students use the Internet to participate in virtual tours by indicating a response option that best described their current usage. Using the values assigned to each response, descriptive statistics were calculated. The number of participants responding to the question, the mean, and standard deviation are displayed in Table 19. With 228 respondents, participate in virtual tours had a mean of 1.93 and a standard deviation of 1.257. The mean of 1.93 for this question indicates that teachers on an average had their students use the Internet Yearly to participate in virtual tours.

Table 19 Descriptive Data: Participate in virtual tours

Question	Number of Respondents	M	SD
Participate in virtual tours	228	1.93	1.257

Merged response options for “participate in virtual tours” are displayed in Figure 18. Based on merged categories 9 respondents (3.9%) reported High Use of the Internet to participate in virtual tours, 26 respondents (11.4%) reported Moderate Use, 61 respondents (26.8%) reported Low Use, and 132 respondents (57.9%) indicated Don’t Know/Use the Internet to participate in virtual tours. The largest single number of responses (132 or 57.9%) was found within “Don’t Know/Use.”

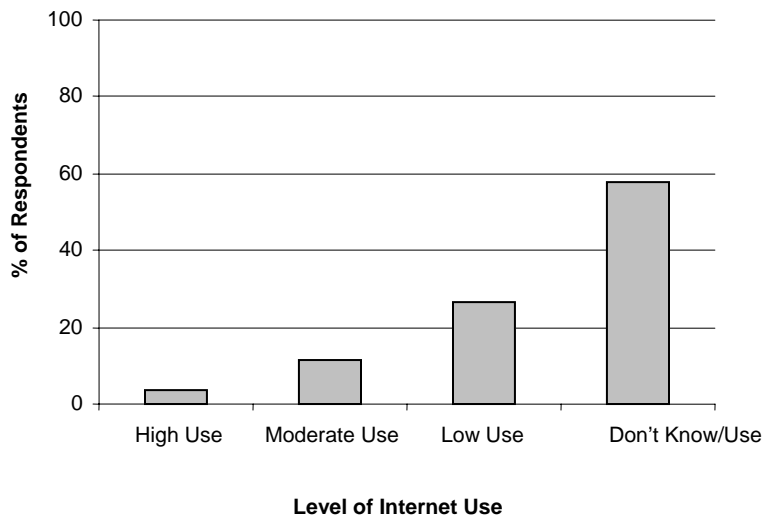


Figure 18 Instructional Tool: Participate in virtual tours

The interviewed teachers on an average used the Internet Yearly to have their students participate in virtual tours. One teacher stated that she usually went to Google where she spent less than half an hour to find a virtual tour for a history subject. A 4th grade teacher took her students to visit the Statue of Liberty and various National Parks online. A high school teacher who taught a unit called ‘Travel West Virginia’ searched

for tours within the state. A high school marketing teacher found a virtual factory tour that showed students the processing of products. A middle school teacher found a Civil War Fort virtual tour that showed how cannons were loaded and food was kept during the war.

Teachers also talked about how using virtual tours took their students outside of rural West Virginia and opened the world to the students. A high school Spanish teacher discussed how the Internet enabled her to take her students to Spanish speaking countries and went on to say:

I am in the middle of nowhere in West Virginia with rural kids and what they know is where they live. Some of them have never gone out of the state. They don't know for example what beaches are, palm trees, or coconuts. Their world is just the school and where they live. [With the Internet] you go around the world and you let them see.

Utilize Educational Interactive Websites

Participants were asked to what extent their students use the Internet to utilize educational interactive websites by indicating a response option that best described their current usage. Using the values assigned to each response, descriptive statistics were calculated. The number of participants responding to the question, the mean, and standard deviation are displayed in Table 20. With 227 respondents, utilize educational interactive websites had a mean of 2.77 and a standard deviation of 1.614. The mean of 2.77 for this question indicates that teachers on an average had their students use the Internet between Quarterly to Yearly to utilize educational interactive websites.

Table 20 Descriptive Data: Utilize educational interactive websites

Question	Number of Respondents	M	SD
Utilize educational interactive websites	227	2.77	1.614

Merged response options for “utilize educational interactive websites” are displayed in Figure 19. Based on merged categories 40 respondents (17.6%) reported High Use of the Internet to utilize educational interactive websites, 53 respondents (23.3%) reported Moderate Use, 48 respondents (21.2%) reported Low Use, and 86 respondents (37.9%) indicated Don’t Know/Use the Internet to utilize educational interactive websites. The largest single number of responses (86 or 37.9%) was found within “Don’t Know/Use.”

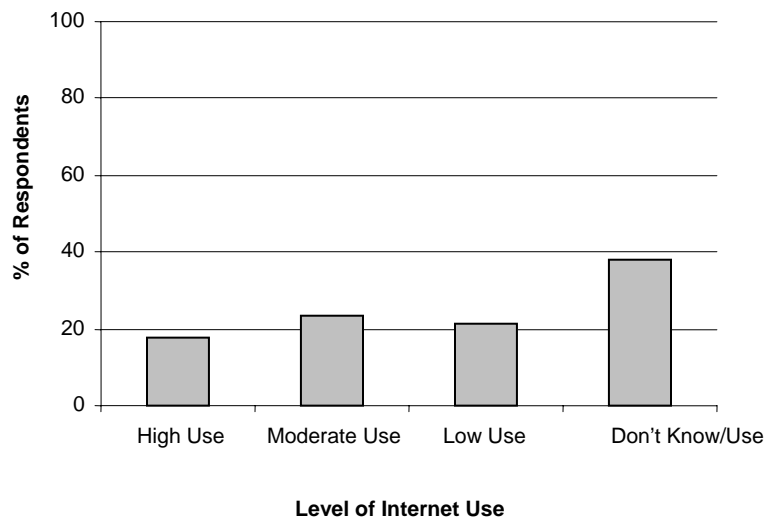


Figure 19 Instructional Tool: Utilize educational interactive websites

The average interviewed teacher used the Internet Quarterly to Yearly for students to utilize educational interactive websites. Teachers mentioned the following websites: Discovery.com, Storylineonline.com, Kraft.com, and Funbrain.com. Teachers located the

interactive websites in less than 20 minutes and either had their students use the sites individually in a computer lab setting or in collaborative groups in the classroom.

One 3rd grade teacher whose class was studying the artist Picasso searched the Internet for material for this unit. Using Google the teacher found several elementary grade level lesson plans dealing with Picasso. The teacher also found the Mr. Picasso Head website where students could create their own drawings. Students chose head outline, eyes, nose, brows, ears, hair and lips and then moved the features around to create drawings similar to Picasso's artwork. The teacher printed out the drawings for the students to take home.

In a 1st grade classroom setting the Title I reading teacher brought in an interactive whiteboard and attached it to an Internet connected computer. The reading teacher then accessed Storylineonline.com, a site sponsored by the Screen Actor's Guild Association. This site had an activity guide for the teachers to download to use with his/her class. The reading teacher worked with students in a small group to read, listen, and then complete comprehension activities. The 1st grade classroom teacher felt that when the Title I reading teacher utilized the Internet the students were more interested in reading the books.

A 4th grade teacher used Google to search for interactive websites and tours. For her health class she used Discovery.com which led her to Innerbody.com, a human anatomy online site. This site gave students the opportunity to see various cross sectional views of the heart and identify major components of the heart. She also felt that students retain more from the lesson when they can see what the teacher is talking about.

Access Audio and/or Video Clips

Participants were asked to what extent their students use the Internet to access audio and/or video clips by indicating a response option that best described their current usage. Using the values assigned to each response, descriptive statistics were calculated. The number of participants responding to the question, the mean, and standard deviation are displayed in Table 21. With 228 respondents, access audio and/or video clips had a mean of 2.49 and a standard deviation of 1.494. The mean of 2.49 for this question indicates that teachers on an average had their students use the Internet between Yearly to Quarterly to access audio and/or video clips.

Table 21 Descriptive Data: Access audio and/or video clips

Question	Number of Respondents	M	SD
Access audio and/or video clips	228	2.49	1.494

Merged response options for access audio and/or video clips are displayed in Figure 20. Based on merged categories 20 respondents (8.8%) reported High Use of the Internet to access audio and/or video clips, 62 respondents (27.2%) reported Moderate Use, 43 respondents (18.9%) reported Low Use, and 103 respondents (45.2%) indicated Don't Know/Use the Internet to access audio and/or video clips. The largest single number of responses (103 or 45.2%) was found within "Don't Know/Use."

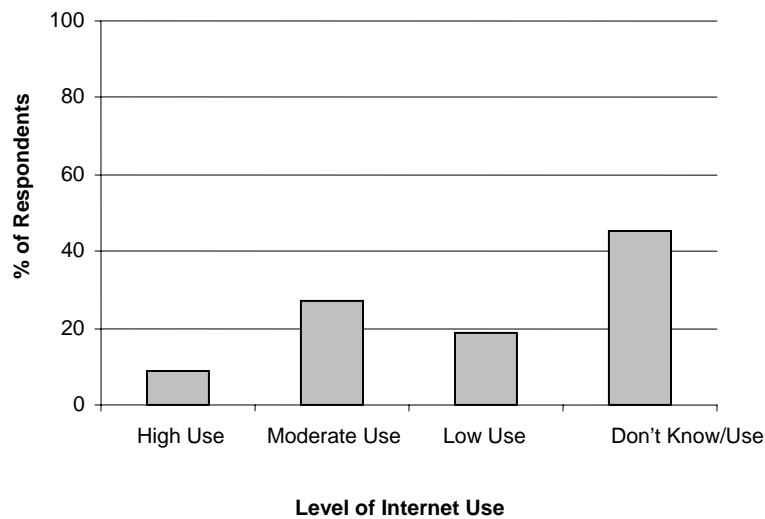


Figure 20 Instructional Tool: Access audio and/or video clips

The interviewed teachers on an average used the Internet almost Quarterly to access audio and/or video clips. Many of the teachers had students prepare a PowerPoint about his/her research project. Teachers commented that adding pictures and clips to student presentations helped the students with their oral presentation and made it more interesting for the other students.

Find Information and/or Resources

Participants were asked to what extent their students use the Internet to find information and/or resources by indicating a response option that best described their current usage. Using the values assigned to each response, descriptive statistics were calculated. The number of participants responding to the question, the mean, and standard deviation are displayed in Table 22. With 228 respondents, find information and/or resources had a mean of 3.68 and a standard deviation of 1.703. The mean of 3.68 for this question indicates that teachers on an average had their students use the Internet between Monthly to Quarterly to find information and/or resources.

Table 22 Descriptive Data: Find information and/or resources

Question	Number of Respondents	M	SD
Find information and/or resources	228	3.68	1.703

Merged response options for “find information and/or resources” are displayed in Figure 21. Based on merged categories 93 respondents (40.8%) reported High Use of the Internet to find information and/or resources, 53 respondents (23.2%) reported Moderate Use, 31 respondents (13.6%) reported Low Use, and 51 respondents (22.4%) indicated Don’t Know/Use the Internet to find information and/or resources. The largest single number of responses (93 or 41.8%) was found within “High Use.”

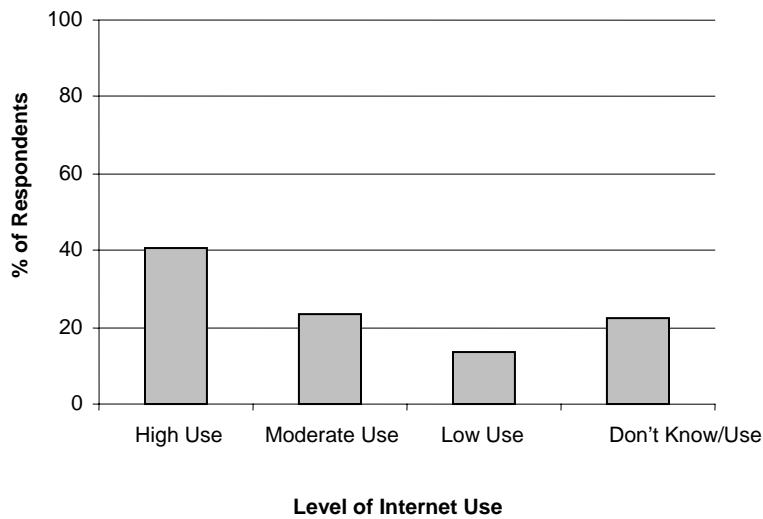


Figure 21 Instructional Tool: Find information and/or resources

The interviewed teachers on an average used the Internet Weekly to Monthly to have their students find information and/or resources. Teachers had students use the Internet to research topics the class was studying. A high school science teacher had his class complete research on animal and plant cells. He also had students download pictures to add to their PowerPoint presentations. Other teachers used the Internet to have

students find information about Black History, foreign countries and their cultures, world religions, food allergies, historical events, and U.S. Presidents.

Teachers were concerned with students finding reliable and valid information. One teacher created a website form for the students to fill out about websites used for their reports. Students had to find the site's author, domain, and last updated information. The teacher went on to say that students needed to understand that not all of the information on the Web was reliable and that she felt that by completing the form students were learning good research techniques. The majority of the teachers interviewed pre-selected sites for students to use.

Teachers also mentioned that their schools were in small rural communities and that the students had limited resources. These teachers felt that the Internet helped students find more information than what was available in the schools' libraries. A world history teacher, who took his classes weekly to the computer lab for Internet research, commented:

There is so much more information on the Internet. Anything you type up you can go into and look at thousands of sites at the click of your finger tips. At the library you can spend 30 minutes and only get one or two articles.

Participate in an Electronic Conference

Participants were asked to what extent their students use the Internet to participate in an electronic conference by indicating a response option that best described their current usage. Using the values assigned to each response, descriptive statistics were calculated. The number of participants responding to the question, the mean, and standard deviation are displayed in Table 23. With 228 respondents, participate in an electronic

conference had a mean of 1.13 and a standard deviation of 0.528. The mean of 1.13 for this question indicates that teachers on an average had their students use the Internet less than Yearly to participate in an electronic conference.

Table 23 Descriptive Data: Participate in an electronic conference

Question	Number of Respondents	M	SD
Participate in an electronic conference	228	1.13	0.528

Merged response options for “participate in an electronic conference” are displayed in Figure 22. Based on merged categories 1 respondent (0.4%) reported High Use of the Internet to participate in an electronic conference, 2 respondents (0.9%) reported Moderate Use, 12 respondents (5.3%) reported Low Use, and 213 respondents (93.4%) indicated Don’t Know/Use the Internet to participate in an electronic conference. The largest single number of responses (213 or 93.4%) was found within “Don’t Know/Use.”

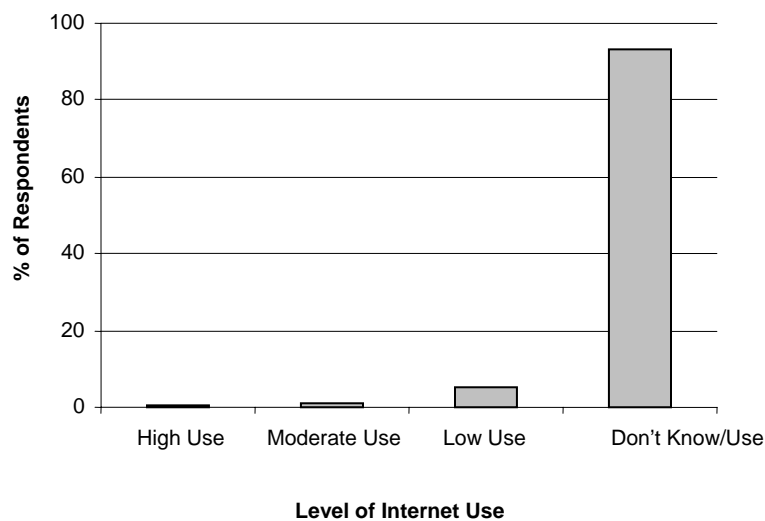


Figure 22 Instructional Tool: Participate in an electronic conference

Communicate with Other Students

Participants were asked to what extent their students use the Internet to communicate with other students by indicating a response option that best described their current usage. Using the values assigned to each response, descriptive statistics were calculated. The number of participants responding to the question, the mean, and standard deviation are displayed in Table 24. With 226 respondents, communicate with other students had a mean of 1.42 and a standard deviation of 1.093. The mean of 1.42 for this question indicates that teachers on an average had their students use the Internet less than Yearly to communicate with other students.

Table 24 Descriptive Data: Communicate with other students

Question	Number of Respondents	M	SD
Communicate with other students	226	1.42	1.093

Merged response options for “communicate with other students” are displayed in Figure 23. Based on merged categories 10 respondents (4.4%) reported High Use of the Internet to communicate with other students, 11 respondents (4.9%) reported Moderate Use, 13 respondents (5.8%) reported Low Use, and 192 respondents (85%) indicated Don’t Know/Use the Internet to communicate with other students. The largest single number of responses (192 or 85%) was found within “Don’t Know/Use.”

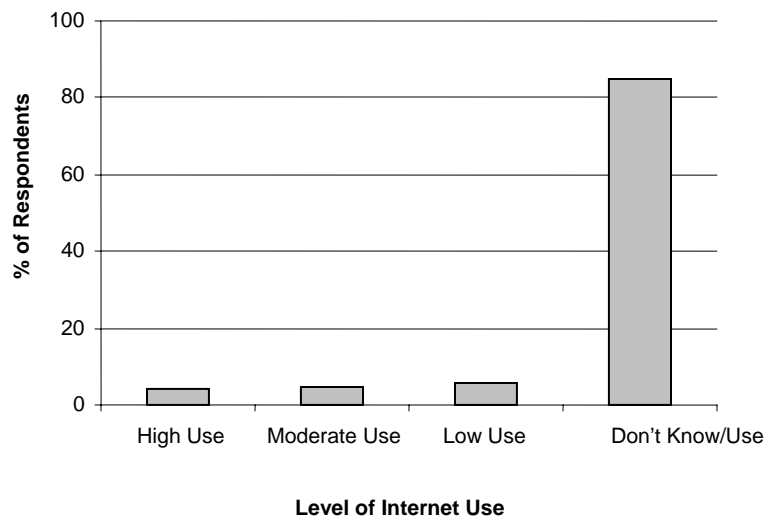


Figure 23 Instructional Tool: Communicate with other students

Access Online Encyclopedias or Dictionaries

Participants were asked to what extent their students use the Internet to access online encyclopedias or dictionaries by indicating a response option that best described their current usage. Using the values assigned to each response, descriptive statistics were calculated. The number of participants responding to the question, the mean, and standard deviation are displayed in Table 25. With 226 respondents, access online encyclopedias or dictionaries had a mean of 3.08 and a standard deviation of 1.681. The mean of 3.08 for this question indicates that teachers on an average had their students use the Internet Quarterly to access online encyclopedias or dictionaries.

Table 25 Descriptive Data: Access online encyclopedias or dictionaries

Question	Number of Respondents	M	SD
Access online encyclopedias or dictionaries	226	3.08	1.681

Merged response options for “access online encyclopedias or dictionaries” are displayed in Figure 24. Based on merged categories 55 respondents (24.1%) reported

High Use of the Internet to access online encyclopedias or dictionaries, 62 respondents (4.9%) reported Moderate Use, 37 respondents (16.1%) reported Low Use, and 75 respondents (32.8%) indicated Don't Know/Use the Internet to access online encyclopedias or dictionaries. The largest single number of responses (75 or 32.8%) was found within "Don't Know/Use."

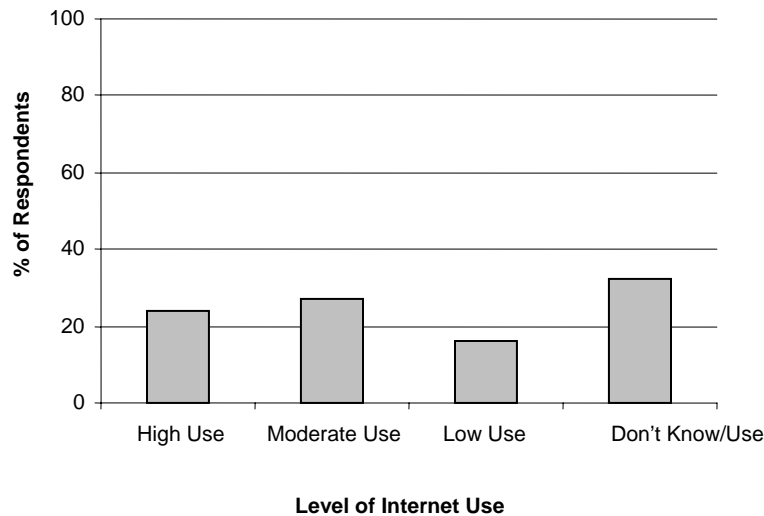


Figure 24 Instructional Tool: Access online encyclopedias or dictionaries

Use Online Tutoring or Homework Help

Participants were asked to what extent their students use online tutoring or homework help by indicating a response option that best described their current usage. Using the values assigned to each response, descriptive statistics were calculated. The number of participants responding to the question, the mean, and standard deviation are displayed in Table 26. With 227 respondents, use online tutoring or homework help had a mean of 1.81 and a standard deviation of 1.462. The mean of 1.81 for this question indicates that teachers on an average had their students access the Internet less than Yearly to use online tutoring or homework help.

Table 26 Descriptive Data: Use online tutoring or homework help

Number of Respondents	M	SD
227	1.81	1.462

Merged response options for “use online tutoring or homework help” are displayed in Figure 25. Based on merged categories 22 respondents (9.6%) reported High Use of the Internet to use online tutoring or homework help, 18 respondents (7.9%) reported Moderate Use, 22 respondents (9.6%) reported Low Use, and 165 respondents (72.8%) indicated Don’t Know/Use the Internet to use online tutoring or homework help. The largest single number of responses (165 or 72.8%) was found within “Don’t Know/Use.”

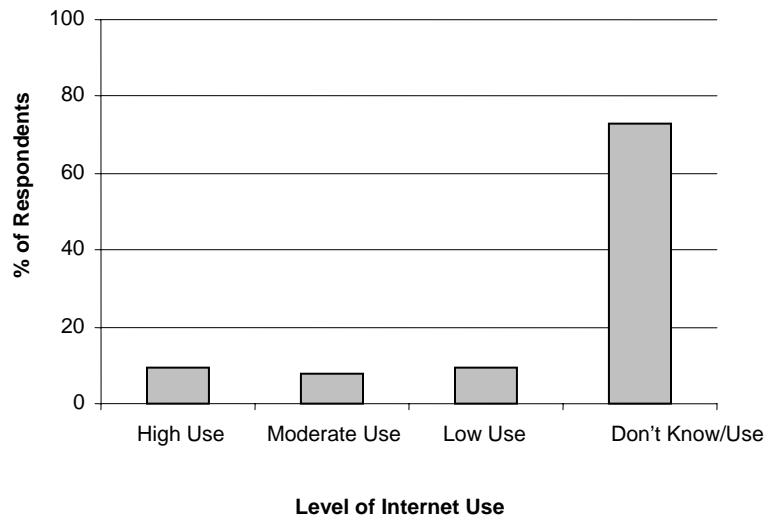


Figure 25 Instructional Tool: Use online tutoring or homework help

Read About Current Events

Participants were asked to what extent their students use the Internet to read about current events by indicating a response option that best described their current usage. Using the values assigned to each response, descriptive statistics were calculated. The

number of participants responding to the question, the mean, and standard deviation are displayed in Table 27. With 228 respondents, read about current events had a mean of 3.14 and a standard deviation of 1.948. The mean of 3.14 for this question indicates that teachers on an average had their students use the Internet Quarterly to read about current events.

Table 27 Descriptive Data: Read about current events

Question	Number of Respondents	M	SD
Read about current events	228	3.14	1.948

Merged response options for “read about current events” are displayed in Figure 26. Based on merged categories 79 respondents (34.6%) reported High Use of the Internet to read about current events, 34 respondents (14.9%) reported Moderate Use, 24 respondents (10.6%) reported Low Use, and 91 respondents (39.9%) indicated Don’t Know/Use the Internet to read about current events. The largest single number of responses (91 or 39.9%) was found within “Don’t Know/Use.”

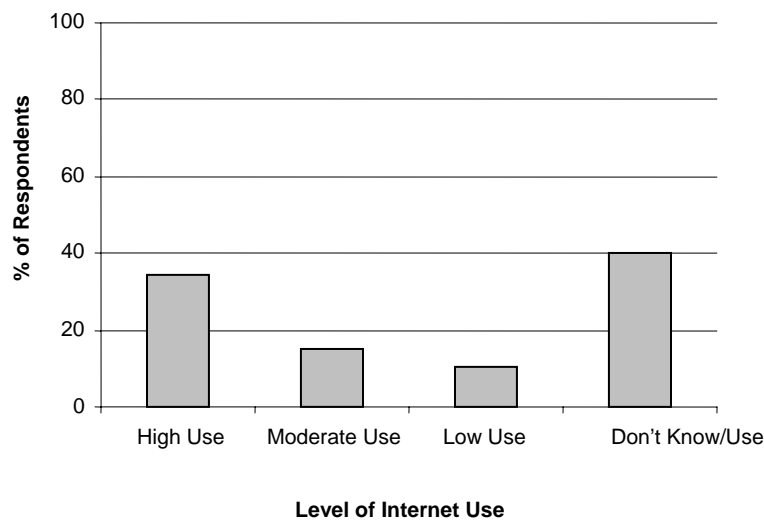


Figure 26 Instructional Tool: Read about current events

Read Digital Books Online

Participants were asked to what extent their students use the Internet to read digital books online by indicating a response option that best described their current usage. Using the values assigned to each response, descriptive statistics were calculated. The number of participants responding to the question, the mean, and standard deviation are displayed in Table 28. With 227 respondents, read digital books online had a mean of 1.29 and a standard deviation of 0.854. The mean of 1.29 for this question indicates that teachers on an average had their students use the Internet less than Yearly to read digital books online.

Table 28 Descriptive Data: Read digital books online

Question	Number of Respondents	M	SD
Read digital books online	227	1.29	0.854

Merged response options for “read digital books online” are displayed in Figure 27. Based on merged categories 3 respondents (1.3%) reported High Use of the Internet to read digital books online, 8 respondents (3.5%) reported Moderate Use, 19 respondents (8.4%) reported Low Use, and 197 respondents (86.8%) indicated Don’t Know/Use the Internet to read digital books online. The largest single number of responses (197 or 86.8%) was found within “Don’t Know/Use.”

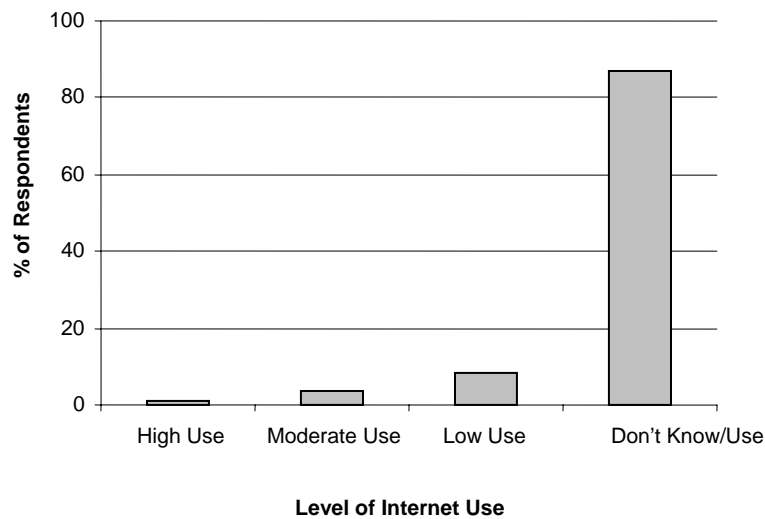


Figure 27 Instructional Tool: Read digital books online

Participate in a Weblog/Blog

Participants were asked to what extent their students use the Internet to participate in Weblog/Blog by indicating a response option that best described their current usage. Using the values assigned to each response, descriptive statistics were calculated. The number of participants responding to the question, the mean, and standard deviation are displayed in Table 29. With 227 respondents, participate in a Weblog/Blog had a mean of 1.10 and a standard deviation of 0.523. The mean of 1.10 for this question indicates that teachers on an average did not have their students use the Internet to participate in Weblog/Blog.

Table 29 Descriptive Data: Participate in a Weblog/Blog

Question	Number of Respondents	M	SD
Participate in Weblog/Blog	227	1.10	0.523

Merged response options for “participate in Weblog/Blog” are displayed in Figure 28. Based on merged categories 2 respondents (0.9%) reported High Use of the Internet

to participate in Weblog/Blog, 2 respondents (0.9%) reported Moderate Use, 5 respondents (2.2%) reported Low Use, and 218 respondents (96%) indicated Don't Know/Use the Internet to participate in Weblog/Blog. The largest single number of responses (218 or 96%) was found within "Don't Know/Use."

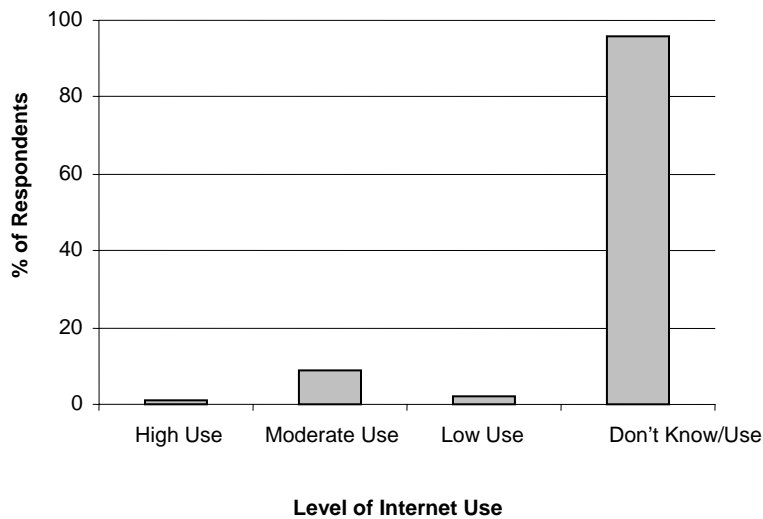


Figure 28 Instructional Tool: Participate in Weblog/Blog

Participate in a Wiki

Participants were asked to what extent their students use the Internet to participate in a Wiki by indicating a response option that best described their current usage. Using the values assigned to each response, descriptive statistics were calculated. The number of participants responding to the question, the mean, and standard deviation are displayed in Table 30. With 228 respondents, participate in a Wiki had a mean of 1.04 and a standard deviation of 0.337. The mean of 1.04 for this question indicates that teachers on an average do not use the Internet to have students participate in a Wiki.

Table 30 Descriptive Data: Participate in a Wiki

Question	Number of Respondents	M	SD
Participate in a Wiki	228	1.04	0.337

Merged response options for “participate in a Wiki” are displayed in Figure 29. Based on merged categories 1 respondent (0.4%) reported High Use of the Internet to participate in a Wiki, 1 respondent (0.4%) reported Moderate Use, 1 respondent (0.4%) reported Low Use, and 225 respondents (98.7%) indicated Don’t Know/Use the Internet to participate in a Wiki. The largest single number of responses (225 or 98.7%) was found within “Don’t Know/Use.”

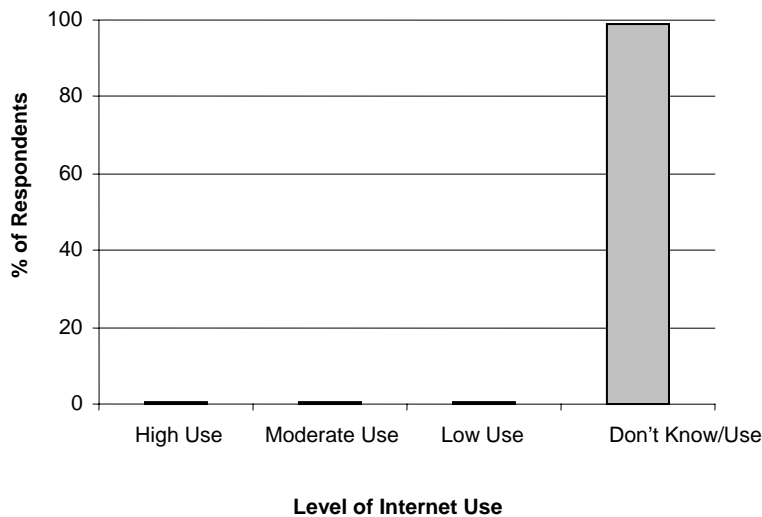


Figure 29 Instructional Tool: Participate in a Wiki

Communicate with Students from Other Cultures

Participants were asked to what extent their students use the Internet to communicate with students from other cultures by indicating a response option that best described their current usage. Using the values assigned to each response, descriptive statistics were calculated. The number of participants responding to the question, the

mean, and standard deviation are displayed in Table 31. With 228 respondents, communicate with students from other cultures had a mean of 1.12 and a standard deviation of 0.533. The mean of 1.12 for this question indicates that teachers on an average do not use the Internet to have their students communicate with students from other cultures.

Table 31 Descriptive Data: Communicate with students from other cultures

Question	Number of Respondents	M	SD
Communicate with students from other cultures	228	1.12	0.533

Merged response options for “communicate with students from other cultures” are displayed in Figure 30. Based on merged categories 1 respondent (0.4%) reported High Use of the Internet to communicate with students from other cultures, 4 respondents (1.8%) reported Moderate Use, 10 respondents (4.4%) reported Low Use, and 213 respondents (93.4%) indicated Don’t Know/Use the Internet to communicate with students from other cultures. The largest single number of responses (213 or 93.4%) was found within “Don’t Know/Use.”

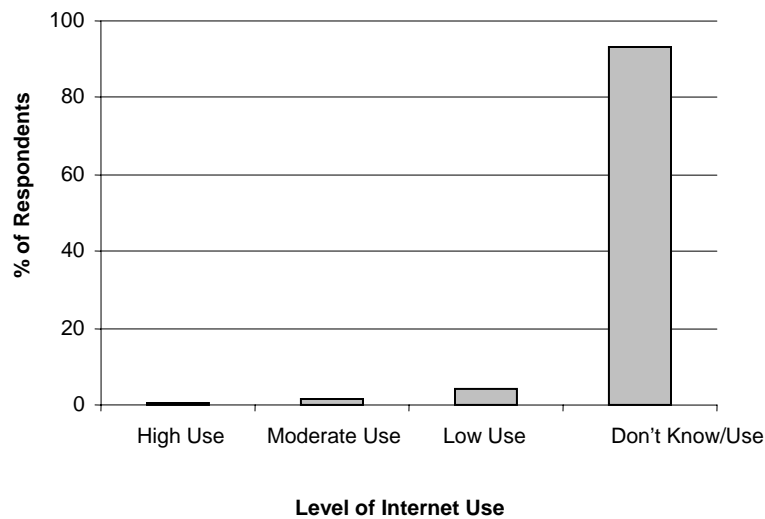


Figure 30 Instructional Tool: Communicate with students from other cultures

Summary of the Extent of Instructional Use

To find the extent to which teachers are using the Internet as an instructional tool, participants were asked to check one response option that best described their current Internet usage for each of 20 questions. In Table 32, the 20 instructional tool questions are ranked in order from most used to least used. The three top uses of the Internet as an instructional tool were to: find information and/or resources (mean of 3.68), read about current events (mean of 3.14), and access online encyclopedias or dictionaries (mean of 3.08). The four lowest uses of the Internet as an instructional tool are to: participate in a Wiki (mean of 1.04), participate in Weblog/blog (mean of 1.10), communicate with students from other cultures (mean of 1.12), and participate in an electronic conference (mean of 1.13).

Table 32 Descriptive Data: Instructional tool questions

Questions	Number of Respondents	M	SD
Find information and/or resources	228	3.68	1.70
Read about current events	228	3.14	1.95
Access online encyclopedias or dictionaries	229	3.08	1.68
Utilize educational interactive websites	227	2.77	1.61
Access audio and/or video clips	228	2.49	1.49
Access an online library	228	2.41	1.55
Access online course materials	226	2.12	1.58
Participate in virtual tours	228	1.93	1.26
Use online tutoring or homework help	227	1.81	1.46
Access lecture notes or assignment	227	1.76	1.42
Participate in Web-based scavenger hunts	228	1.69	1.21
Communicate with content experts	228	1.69	1.33
Participate in WebQuest projects	228	1.54	1.06
Publish multimedia projects	228	1.48	0.99
Communicate with other students	226	1.42	1.09
Read digital books online	227	1.29	0.85
Participate in an electronic conference	228	1.13	0.53
Communicate with students from other cultures	228	1.12	0.53
Participate in a Weblog/Blog	227	1.10	0.52
Participate in a Wiki	228	1.04	0.34

Teachers reported Moderate Use for having their student use the Internet to find information and/or resources, and Low Use to having students read about current events, access online encyclopedias or dictionaries, utilize educational interactive websites, access audio and/or video clips, access an online library, access online course materials, participate in virtual tours, use online tutoring or homework help, access lecture notes or assignments, participate in Web-based scavenger hunts, communicate with content experts, and participate in WebQuest projects. Teacher reported Low Use to Don't Know/Use for the remaining seven items.

Summary of Interviews

In looking for teachers' experiences in finding, creating, and using Internet resources for professional and instructional activities the research found interviewed teachers used search engines such as Google and Ask to find lesson plans and supplemental material for their lessons. Teachers used Discovery.com for science and health lessons and Historychannel.com for social studies lessons. Lesson plans found on the Internet are adapted to meet the needs of their students, use available resources and/or address West Virginia Content Standards and Objectives.

Teachers indicated that they spent between 10 to 30 minutes a day to look for lesson plans. Time spent looking for supplemental information for lessons varied according to type of lesson. For example, an elementary physical education teacher averaged 10 minutes a day looking for one activity, a social studies teacher preparing a PowerPoint that he will use all week spent more than 5 hours looking for supplemental information for the unit, and a special education teacher spent two hours looking and completing a project.

Interviewed teachers indicated that they create their own Internet activities or modify Internet activities that are in their textbooks. The teachers have their students use the Internet to find information that is not included in the textbooks or in the school's library materials. The interviewed teachers believed that the Internet was a faster and more efficient way for the students to find information. Many of the teachers have students look for pictures and audio or video clips to add to PowerPoint presentations.

Interviewed teachers pointed out that when students participate in virtual tours and use interactive Websites they gained a greater understanding of a subject. Using the

Internet teachers took the students to places that the class was studying, had students experience past historical events, or had students communicate with authors. Teachers believed that virtual tours helped to open the world to rural West Virginia students and that the vast resources available on the Internet helped schools with limited resources.

Ancillary Findings

Analysis of descriptive data revealed that West Virginia P-12 teachers use of the Internet as a professional tool on an average varied from “Don’t Know/Use” to “Monthly” for each of the 10 professional tool questions. The teachers’ use of the Internet as an instructional tool on an average also varied from “Don’t Know/Use” to “Monthly” for each of the 20 instructional tool questions. Further analysis utilizing the demographic data was conducted to find significant differences within the demographics. An Analysis of Variance (ANOVA) was used to determine if significant differences existed within the demographics for the professional and instructional tool questions.

Survey Demographic Data

The demographic information on the *West Virginia Teachers’ Internet Usage Survey (Survey)* included questions as to the participant’s gender, age, grade and subjects taught. Participants were also asked whether or not they participated in a West Virginia Internet related initiative, how they obtained their Internet knowledge, if they regularly assigned work requiring the use of the Internet, how many years they had been teaching, if they had taken an online course, and the number of professional development hours completed on using the Internet in 2004-2005. Participants were further asked about Internet access at their home, their school’s computer lab, and their classroom. The final two questions asked the participants to identify the greatest barrier to using the Internet

for both professional or instructional activities, and the percentage of students receiving free or reduced lunch.

A One-way ANOVA found no significant difference between the professional and instructional tool questions and age of respondents, number of years taught, and how the respondents obtained their Internet knowledge. Although slight differences were found between the professional and instructional questions and gender; grade levels taught; number of professional development hours; and type of Internet connection in the home, computer lab and school; the number of participants in the group was either too small or no one group used the Internet consistently more than another. Three areas that showed significant differences were participation in West Virginia Internet initiatives, identified greatest barrier to using the Internet, and the percentage of students receiving free or reduced lunch.

West Virginia Internet Initiatives

Participants were asked to indicate all of the West Virginia Internet initiatives in which they had participated (Trek21, The Solution Site, World School Program, RuralNet Project, IBM Reinventing Education, and SAS inSchool). Of the 233 respondents, 45 (19.3%) participated in SAS inSchool, 27 (11.6%) participated in IBM Reinventing Education Project, 27 (11.6%) participated in The Solution Site, 16 (6.9%) participated in World School Project, 6 (2.6%) participated in RuralNet Project, and 3 (1.3%) participated in Trek21.

Table 33 ANOVA Data: Internet use and WV Internet initiatives

Question	Trek21	The Solution Site (Phase 9)	World School	RuralNet Project	IBM Reinventing	SAS inschool
Find lesson plans	.404	.069	.170	.395	.110	.757
Find supplemental information for lessons	.788	.042*	.278	.045*	.029*	.005*
Post lecture notes or assignments	.788	.003*	.003*	.800	.011*	.466
Create or update class or school Web page(s)	.901	.040*	.001*	.013*	.005*	.209
Communicate with parents	.993	.481	.247	.608	.019*	.001*
Communicate with students	.785	.676	.005*	.388	.009*	.000*
Communicate with experts/teachers	.650	.142	.015*	.959	.792	.339
Participate in educational online discussions	.617	.002*	.000*	.018*	.000*	.041*
Participate in educational online chat rooms	.611	.004*	.000*	.108	.007*	.460
Instant message in an educational environment	.067	.502	.008*	.407	.128	.598
Participate in Web-based scavenger hunts	.658	.003*	.307	.096	.432	.341
Participate in WebQuest projects	.458	.061	.337	.774	.160	.082
Communicate with content experts	.706	.248	.014*	.230	.002*	.366
Access lecture notes or assignments	.513	.173	.014*	.314	.006*	.013*
Access online course materials	.371	.070	.003*	.169	.032*	.013*
Access an online library	.930	.011*	.006*	.884	.005*	.117
Publish multimedia projects	.399	.006*	.021*	.719	.074	.057
Participate in virtual tours	.420	.000*	.016*	.074	.384	.945
Utilize educational Interactive websites	.805	.004*	.025*	.058	.012*	.312
Access audio and/or video clips	.531	.001*	.007*	.766	.084	.289
Find Information and/or resources	.340	.001*	.212	.475	.007*	.235
Participate in an electronic conference	.672	.009*	.003*	.551	.055	.076
Communicate with other students	.159	.420	.184	.346	.606	.025*
Access online encyclopedias or dictionaries	.981	.020*	.065	.266	.003*	.150
Use online tutoring or homework help	.299	.027*	.267	.242	.026*	.216
Read about current events	.431	.062	.257	.973	.024*	.237
Read digital books online	.552	.001*	.027*	.902	.046*	.235
Participate in a Weblog/Blog	.753	.000*	.004*	.647	.052	.084
Participate in a Wiki	.851	.063	.008*	.796	.055	.225
Communicate with students from other cultures	.677	.157	.015*	.839	.942	.625

*p < .05

A One-way ANOVA was used to determine if any differences exist between professional and instructional tool questions on using the Internet and the six West Virginia Internet initiatives. The significant (p-value) of the ANOVA is summarized in Table 33. Those values that show a conditional probability that a difference is significant are marked with an asterisk.

An analysis of the means showed that in each case where p was less than .05 ($p < .05$) respondents who participated in a West Virginia Internet initiative used the Internet more than respondents who had not participated in an initiative. The Trek21 and RuralNet Internet initiatives showed no significance or little significant in each of the 30 questions. The World School Internet initiative showed the significant differences in 20 of the 30 professional and instructional questions. The Solution Site and IBM Reinventing Education both showed significant differences in 17 of the questions and SAS inSchool showed significant differences in 7 of the questions. A further analysis of the data found that 86 or 37% of the respondents had participated in one or more of the West Virginia Internet initiatives. An analysis of the means for each question comparing the respondents who had participated in one or more of the initiatives to those who had not; found that teachers who had participated in an Internet initiative used the Internet more as a professional and instructional tool.

Greatest Barrier in Using the Internet

Participants were asked to identify the one response option that they felt was the greatest barrier in using the Internet for professional or instructional activities. The five response choices were: limited planning time, limited professional development in using the Internet for professional or instructional activities, limited number of Internet

connected computers, slow Internet speed, and other. Forty-nine participants chose ‘other’ or chose more than one answer. The following response options were added to the database: combination of barriers, students’ age/abilities, teacher’s knowledge/ability, and technical difficulties. The majority of the respondents (98 or 43%) indicated that limited planning time was the greatest barrier to using the Internet. The percentages of all responses are displayed in Figure 32.

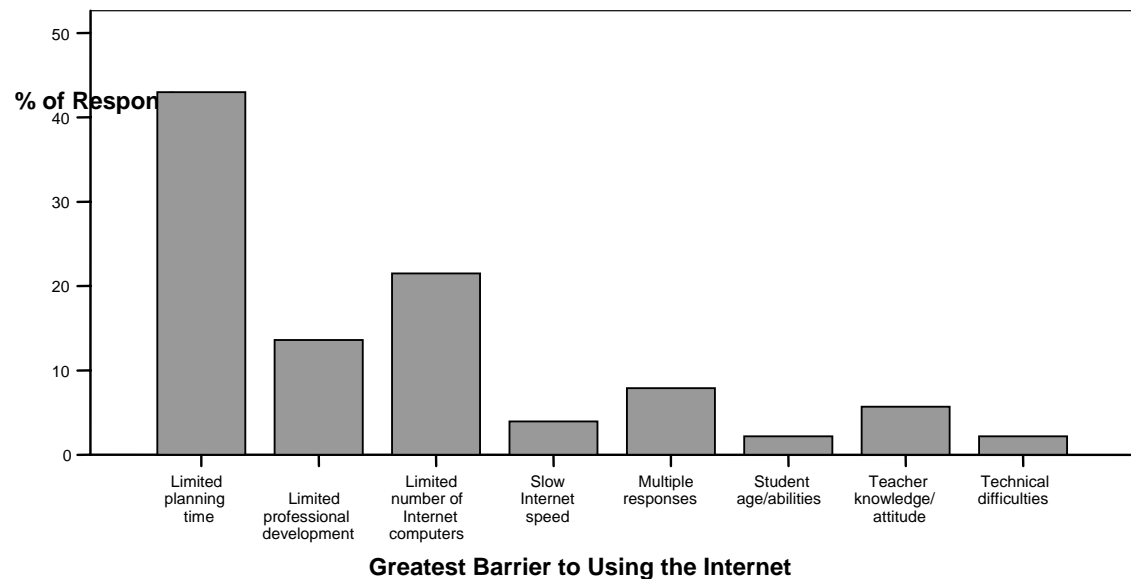


Figure 31 Descriptive Data: Greatest barrier to using the Internet

A One-way ANOVA was used to determine if any differences exist between professional and instructional tool questions on using the Internet and what teachers felt was the greatest barrier to using the Internet. Significant difference was found in: access online course materials (F, 2.197, (7, 213), $p < 0.036$), access audio and/or video clips (F, 2.161, (7, 213), $p < 0.039$), find information and/or resources (F, 3.323, (7, 213), $p < 0.002$), access online encyclopedias (F, 2.853, (7, 213), $p < 0.007$), read digital books

online ($F, 2.442, (7, 213), p < 0.020$), and communicate with students from other cultures ($F, 2.852, (7, 213), p < 0.007$). An analysis of the means indicated that teachers who felt that the greatest barrier to using the Internet was slow Internet speed were the teachers who had their students use the Internet more to access online course materials, access audio and/or video clips, find information and/or resources, access online encyclopedias, and read digital books online. Teachers who felt that the greatest barrier to using the Internet was technical difficulties used the Internet more to have their students communicate with students from other cultures.

Percentage of Students Receiving Free or Reduced Lunches

Participants were asked to identify the percentage of the students receiving free or reduced lunch at their school (below 25%, between 25% and 50%, between 50% and 75%, and above 75%). The number of respondents and percent of respondents in each category are displayed in Table 53. Of the 219 respondents to this question, 26 (11.2%) checked “below 25%”, 82 (35.2%) checked “between 25% and 50%”, 70 (30%) checked “between 50% and 75%”, 41 (17.6%) checked “above 75%”. Fourteen (6%) did not answer this question.

Table 34 Descriptive Data: Free or reduced lunch schools

Free or Reduced Lunch Schools	Number	Percent
Below 25%	26	11.2
Between 25% and 50%	82	35.2
Between 50% and 75%	70	30.0
Above 75%	41	17.6

A One-way ANOVA was used to determine if any differences exist between professional and instructional tool questions on using the Internet and the percentage of students receiving free or reduced lunches. Significant difference was found in: find

lesson plans (F, 2.654, (3, 214), $p < .050$), participate in Web-based scavenger hunts (F, 3.122, (3, 211), $p < .027$), participate in WebQuest projects (F, 5.066, (3, 211), $p < .002$), communicate with content experts (F, 2.846, (3, 211), $p < .039$), access an online library (F, 3.042, (3, 212), $p < .030$), and find information and/or resources (F, 2.694, (3, 211), $p < .047$).

An analysis of the means found teachers in schools that had over 75% of students receiving free or reduced lunch used the Internet more to find lesson plans. Teachers in schools that had between 25% and 50% of the students receiving free and reduced lunches had more students accessing online libraries. Teachers in schools with less than 25% of the students on free and reduced lunch had students use the Internet more to participate in Web-based scavenger hunts, WebQuest projects, communicate with content experts, and find information and/or resources.

CHAPTER FIVE: SUMMARY AND DISCUSSION

The purpose of this chapter is to present a summary and conclusion of the extent to which West Virginia P-12 teachers are using the Internet as a professional and instructional tool based upon the administration of the *West Virginia Teachers' Internet Usage Survey* and individual interviews with teachers, summarizing their experiences in finding, creating and using Internet resources for professional and instructional activities. Implications for action and recommendations for further research are also presented.

Summary of the Study

Overview of the Problem

According to federal statistics, three percent of the American public school classrooms were connected to the Internet in 1994 and by 2004 the number had grown to over 92% (Cavanagh, 2004). Since most classrooms are now Internet connected the question is: To what extent are teachers integrating the Internet into their teaching?

Studies show that the Internet as an educational tool is being underutilized despite extensive investment in connecting schools to the Internet, increased state and national educational standards for using the Internet, and appeals from business and government for more educational use of the Internet in the classroom (Gibson & Oberg, 2004; U.S. Department of Education, 2005). This underutilization of the Internet in many cases is due to “lack of adequate training and understanding of how computers can be used to enrich the learning experience” (U.S. Department of Education, p. 22).

Internet technology is so new that veteran teachers and teacher education program professionals have had little pre-service training in integrating the Internet into content

areas and using the Internet as a professional and instructional tool to enhance student learning. In order to develop timely and effective teaching methods for integrating the Internet into the educational setting, there is a need to explore how current teachers are finding, creating, and using Internet resources.

West Virginia has one of the highest Internet connected computer-to-student ratios in the nation and was given an overall grade of A in a state-focused supplement to Education Week's Technology Counts 2006 (Technology Counts, 2006). Since 1994 the state has received over \$15 million to help West Virginia teachers integrate technology into their classrooms through projects with an Internet component. Four nationally known Internet initiatives in West Virginia are: The Solution Site, World School Program, IBM Reinventing Education, and SAS inSchool. The state of West Virginia is committed to using technology in its schools and uses ISTE's National Educational Technology Standards for P-12 students and teachers. Even though West Virginia schools were given a grade of A, this chapter will reveal the limited extent to which West Virginia teachers are using the Internet as a professional and instructional tool.

Purpose Statement and Research Questions

The purpose of this study was to investigate the extent to which the Internet is being used as a professional and instructional tool by West Virginia P-12 teachers and to describe West Virginia teachers' experiences in finding, creating, and using Internet resources for professional and instructional activities.

Research questions addressed through quantitative methods in this study are:

1. To what extent are West Virginia P-12 teachers using the Internet as a professional tool?

2. To what extent are West Virginia P-12 teachers using the Internet as an instructional tool in their classrooms?

Qualitative methods were also used to gather anecdotal information with the following goal: To describe West Virginia teachers' experiences in finding, creating, and using Internet resources for professional and instructional activities.

Review of Methods

This study used descriptive research, both quantitative and qualitative methods, to discover the extent of Internet use by West Virginia P-12 teachers and to document examples of how teachers used the Internet. The mixed methods approach allowed the researcher to use quantitative methods to gather data on West Virginia P-12 teachers' Internet usage via an instrument entitled *West Virginia Teachers' Internet Usage Survey* (Appendix A). In this survey two specific categories of Internet use were examined: the extent to which teachers use the Internet as a professional tool and the extent to which they integrate the Internet into instructional activities within the classroom. Qualitative methods included interviews to gather anecdotal information for a more in-depth understanding of how teachers were finding, creating and using Internet resources for professional and instructional activities.

The population for this study was all West Virginia public school teachers who teach in the P-12 environment. A random sample of 492 teachers, provided by the West Virginia Department of Education, was used to obtain a 95% confidence level with a 5% margin of error. All participants were asked to return the *West Virginia Teachers' Internet Usage Survey (Survey)* and the Contact Information form if they wished to participate in an interview. Of the 492 teachers selected to participate in the study, 242

returned the *Survey*, representing a 49% response rate, and 22 returned the Contact Information form.

Part I of the *Survey* was divided into two sections. Ten questions for Section A of Part I were developed from the review of literature on teachers methods for using the Internet as a professional resource. Since past studies have noted that teachers mainly use the Internet to find lesson plans and supplemental information for their lessons, this survey went into greater depth and asked questions about professional use, such as communicating with parents and cohorts, creating Web pages and participating in educational online discussions and chat rooms. Twenty questions for Section B of Part I were developed from the review of literature on how teachers integrate the Internet into their classroom as an instructional tool. Teachers were asked questions about their students' use of the Internet. Questions included whether their students published multimedia projects on the Internet, used WebQuests, accessed interactive websites, and communicated with experts, among other activities.

Responses to questions on the survey were recorded using a 6-point scale: 6 = "Daily", 5 = "Weekly", 4 = "Monthly", 3 = "Quarterly", 2 = "Yearly" and 1 = "Don't Know/Use". This scale was merged into four categories for ease of interpretation and discussion. Daily and Weekly ratings were merged to create a rating of "High Use". The Monthly rating was changed to "Moderate Use". Quarterly and Yearly ratings were merged to create a rating of "Low Use". The Don't Know/Use rating remained the same.

Data were analyzed using the Statistical Program for Social Sciences[®] (SPSS version 14.0). Descriptive statistics were calculated for each of the 30 questions on the *Survey*. To answer research question one, "To what extent are West Virginia P-12

teachers using the Internet as a professional tool?” a mean for each of the 10 questions in Section A was calculated. To answer research question two, “To what extent are West Virginia teachers using the Internet as an instructional tool?” a mean for each of the 20 questions in Section B was calculated.

Part I also contained a listing of six West Virginia Internet related initiatives: Trek21, RuralNet, The Solution Site, World School Program, IBM Reinventing Education, and SAS inSchool. Respondents indicated whether or not they had participated in these programs.

Part II of the *Survey* included demographic questions about the teacher’s gender, age, years of teaching experience, grade levels and subjects taught, Internet training, Internet access at home and school, amount of professional development, whether or not they have taken an online course, if they assigned homework that required Internet use, what they saw as the greatest barrier to using the Internet in their classroom, and their school’s percentage of students receiving free or reduced lunch.

For the qualitative section of this study 14 of the 22 respondents who returned the Interview Contact Information form were interviewed. The distribution of interviewed teachers’ gender, age, and years teaching experience was similar to the overall respondents. The interviews in this study were added to deepen understanding and provide anecdotal information of teachers’ experiences in finding, creating, and using Internet resources for professional and instructional activities.

Major Findings

In response to the professional use questions the average respondent reported Moderate Use for finding supplemental information for lessons and Low Use for finding

lesson plans, communicating with experts and other teachers, communicating with parents and students, posting lecture notes or assignments, creating or updating class or school Web page(s), instant messaging in an educational environment, and participating in educational online discussions. Respondents reported Low Use to Don't Know/Use for participating in educational online chat rooms. Since some schools in West Virginia do not allow instant messaging, it is not surprising that instant messaging in an educational setting received such a low rating. This shows that as a professional tool, teachers are predominately using the Internet for searches and to a less extent for communication.

As an instructional tool, teachers are mainly having their students use the Internet as a reference resource. In response to the instructional use questions the average respondent reported Moderate Use to having their students find information and/or resources and Low Use to having students read about current events, access online encyclopedias or dictionaries, utilize educational interactive websites, access audio and/or video clips, access an online library, access online course materials, participate in virtual tours, use online tutoring or homework help, access lecture notes or assignments, participate in Web-based scavenger hunts, communicate with content experts, and participate in WebQuest projects. Responses ranged from Low Use to Don't Know/Use for publish multimedia projects, communicate with other students, read digital books online, participate in a Wiki, participate in Weblog/Blog, communicate with students from other cultures, and participate in an electronic conference. It should be noted that Weblogs and Wikis are relatively new and teachers may not be that familiar with the concepts. In addition, equipment for electronic conferencing may not be available in all schools. A Spanish teacher who participated in an interview also mentioned that she

would like her students to use email to communicate with students in South America, but students at her school were not allowed to use school computers to email.

To respond to the question of how West Virginia teachers are finding, creating and using Internet resources for professional and instructional activities, interviews were conducted with 14 teachers, who taught pre-school to high school. The interviewed teachers used a variety of search engines to find supplemental material and lesson plans. These teachers modified lesson plans to meet the needs of their students, to meet West Virginia Content Standards and Objectives, and to supplement available classroom resources. Teachers stated that they had little trouble finding lesson plans and supplemental information and could usually find what they needed in less than half an hour.

Interviewed teachers indicated that they create their own Internet activities or modify Internet activities included in their curriculum materials. These teachers had their students use the Internet to find information that is not included in textbooks or in the school's library materials. The interviewed teachers believed that the Internet was a fast and efficient way for students to find information. Many of the teachers had students look for pictures and audio or video clips to add to PowerPoint presentations. One teacher felt that when students participated in virtual tours and use interactive Websites they gained a greater understanding of the concept. Using the Internet, teachers virtually took students to places, had students experience virtual past historical events, or had student communicate with authors. These teachers believed that virtual tours helped to open the world to rural West Virginia students. The interviews show that there is potential for

High Use of the Internet both professionally and instructionally and that the Internet can be used ingeniously when teachers believe it is an effective and efficient tool.

An Analysis of Variance (ANOVA) was used to determine if differences existed among the 30 professional and instructional tool questions and the six West Virginia Internet initiatives. Three initiatives that showed significance ($p < .05$) in more than 15 of the 30 questions were: The Solution Site, World School Program, and the IBM Reinventing Education project. Further analysis of the data found that 86 (or 37%) of the respondents had participated in one or more of the West Virginia Internet initiatives. An analysis of the means of each of the 30 questions comparing the respondents who had participated in one or more of the initiatives to those who had not; found that teachers who had participated in these long-term Internet related initiatives used the Internet more as a professional and instructional tool. This has implications for professional development. Administrators and curriculum specialists should plan long-term Internet professional development projects rather than short blocks of professional development time.

Teachers who regularly assigned work requiring use of the Internet showed significant difference in most of the 30 questions. Teachers who had taken an online course showed significant difference in ten of the 30 questions and an analysis of the means found that these teachers had a higher mean for both professional and instructional use than teachers who had not taken a course. Two interviewed teachers, who were in graduate programs that included online courses, felt they were better prepared than the average teacher to use the Internet as an instructional tool. One interviewed teacher who had recently completed a Masters Degree at Marshall University felt that taking classes

that used WebCT helped him become more proficient in using the Internet and better able to teach his students how to use the Internet. Another graduate student felt that using discussion boards, chat rooms, online research, and online exams helped her as a teacher. She is now more comfortable in emailing the state department of education, searching for online information relevant to her students' needs, communicating with parents, and finding lesson plans that can be modified to meet the needs of her special education students.

Participants were asked what they felt was the greatest barrier to using the Internet for professional or instructional activities at school. Respondents who felt that technical difficulties were the greatest barrier to using the Internet used the Internet more to have their students communicate with students from other cultures. Respondents who felt that the greatest barrier was slow Internet speed were the teachers who had their students use the Internet more to access online course materials, access audio and/or video clips, find information and/or resources, access online encyclopedias, and read digital books online. An analysis of the means showed that these two groups of teachers on an average had their students use the Internet more than other respondents. Teachers who were using the Internet more extensively discovered technical barriers as they experimented with different uses that demanded more bandwidth. They found technical limitations due to slow Internet speed as they moved beyond researching and e-mail use. It appears that teachers who actively use the Internet discover the Internet's limitations, and teachers with limited use do not perceive slow Internet speed and technical problems as barriers.

In discussing barriers with the interviewed teachers, several teachers talked about professional development and technical problems with computers. A retiring teacher who used the Internet extensively saw the need for additional Internet training to advance teachers past only using math and reading tutorials. Another teacher indicated that she could not use the Internet with her students because the school only had dial up connection and when more than three students got on the Internet “it just stopped.” A first grade teacher complained that she had three new computers sitting in boxes in her room for over three months waiting for someone from technical services to come to the school to connect the computers.

Participants were asked to identify the percentage of students receiving free or reduced lunch at their school. An analysis of the means found teachers in schools with over 75% of students receiving free or reduced lunch used the Internet more to find lesson plans. Teachers in schools with between 25-50% of students receiving free or reduced lunch had students use the Internet more to access online libraries. Teachers in schools with less than 25% of the students on free or reduced lunch had students use the Internet more to participate in Web-based scavenger hunts, WebQuest projects, communicate with content experts, and find information and/or resources. Therefore, the extent to which teachers use the Internet instructionally in the more affluent schools is greater than those in less affluent schools where the teachers predominately use the Internet professionally to find lesson plans.

An Analysis of Variance (ANOVA) was used to determine if significant differences existed among the 30 professional and instructional tool questions and the demographic data. Data revealed no significant differences between responses to the

individual 30 questions and age of respondents, years of teaching experience, and how the respondents obtained their Internet knowledge. Although slight differences were found between the professional and instructional questions and gender; grade levels taught; number of professional development hours; and type of Internet connection in the home, computer lab and school, the number of participants in the group was either too small or no one group used the Internet consistently more than another.

Findings Related to the Literature

In looking at how teachers use the Internet as a professional tool this study found 96% of the West Virginia P-12 teachers used the Internet to find supplemental material for lessons, with 45% indicating High Use. Eighty-two percent (82%) used the Internet to find lesson plans with 23% indicating High Use. To make a comparison with the research of Becker (1999) and Vanfossen (2001) whose studies focused on Internet use in secondary schools, data was filtered to only include middle school and high school teachers. This research found that 92% of the 109 secondary teachers used the Internet to find supplemental material for lessons with 48% indicating High Use. Becker (1999) found 68% of the teachers used the Internet mainly to find supplemental information to use in their lessons and Vanfossen (2001) found 85% used the Internet for planning and research.

In looking at the extent to which teachers use the Internet as an instructional tool this study found teachers had their students use the Internet mostly to find information and/or resources. When the data was filtered to only include middle and high school teachers, this research found that 84% of the 109 secondary teachers used the Internet to have their students find information and resources, with 38% of the teachers indicating

High Use. Again, this finding was similar to Becker's (1999) where the most common use of the Internet for students was gathering information or as Vanfossen (2001) stated "encouraging students to use the Internet to gather background information."

Although there was a six year difference between the Becker study and a four year difference between the Vanfossen study and this West Virginia study, the findings were essentially the same. The percent of schools with Internet access from one or more classrooms in the U.S. has increased from 82% in 2000 to 91% in 2004 (National Center for Educational Statistics [NCES], 2005). While the trend indicates an increase in connectivity, this study shows that teachers are still mainly using the Internet as a resource and reference tool, and new instructional activities are used infrequently.

The majority (76%) of West Virginia teachers indicated that they had some form of professional development in using the Internet. Nationally, school districts have begun to offer professional development on integrating the Internet into the curriculum. In 2003, the National Center for Educational Statistics (NCES) found that 82% of schools reported that their school districts offered Internet integrated professional development (NCES, 2005). The six West Virginia Internet initiatives were long-term Internet integrated professional development projects, and the 86 (37%) respondents who had participated in at least one of these projects used the Internet more as a professional and instructional tool than teachers who had not participated. Respondents who had taken an online course also used the Internet more than those who had not. This tracks with the finding that teachers often teach the way they were taught (Wilson et al., 2003). It also shows that more extensive experiences with Internet usage, whether it be long-term professional development or on-line graduate courses result in more instructional use of the Internet.

Based on these findings, Internet professional development needs to be long-term in-depth and interactive.

The West Virginia study found no significant difference in the number of years teachers taught and teachers' use of the Internet as a professional and instructional tool. This agrees with Woodbridge (2004) who found that although new teachers might have had a college course in using the Internet they are mainly focused in their beginning years on gaining teaching experience and on classroom management skills. Darling-Hammond, Chung, and Frelow's (2002) study further showed that many beginning teachers did not feel adequately prepared to use technology in the classroom.

Interviewed teachers indicated that in most cases they modified lesson plans and textbook Internet materials to meet the needs of their students and to supplement classroom resources. These teachers also added that students enjoyed using the Internet and that the Internet enabled students to find more information than what was available in the school library or in the textbook. This follows Scholfield and Davidson's (2003) observations that teachers wanted to select appropriate Internet activities for their classrooms and when they design activities they were more invested in using the Internet.

The interviewed teachers were concerned with students' use of the Internet to access inappropriate sites. This agrees with other authors who found that teachers are concerned with the rise in plagiarism, the protection of student privacy, and media literacy which includes evaluating websites (Hanson & Carlson, 2005; Lever-Duffy et al., 2005; McMurtry, 2001; Parsad & Jones, 2005; Scott, 2003; Shelly et al., 2006). Teachers were also concerned with student access to the Internet known as the digital divide. Although E-rate has helped establish Internet connections in West Virginia schools, there

is still inequity in access to the Internet in the homes of students. Hanson and Carlson (2005) found that teachers have to be aware of students who might not have Internet access at home when assigning work that requires use of the Internet. A NCES study showed that 72% of 4th-graders and 76% of 8th-graders who are eligible for free or reduced-price lunches reported that they have a home computer; whereas 93% of 4th-graders and 95% of 8th-graders not on free or reduced-price lunches have home computers (Parsad & Jones, 2005). One interviewed teacher mentioned that she did not give homework requiring the use of the Internet because she knew that some of her students did not have computers at home. Another teacher stated that the only Internet connection in her local area was dial-up which was too slow to download pictures or have students complete Internet interactive activities. These teachers were reflecting on a perceived scarcity of Internet (or high speed Internet) connections at home, and the belief that Internet instructional activities require higher Internet speed to be effective and successful.

Unanticipated Outcomes

The expectation that high school teachers and students would use the Internet more than the primary, intermediate and middle school teachers and students was not borne out by this study. No statistically significant differences were found between grade level taught and the 30 professional and instructional questions. However, several teachers returned blank surveys indicating they were preschool teachers and did not use the Internet. A kindergarten teacher responded to the professional use questions and checked “Don’t Know/Use” for all of the instructional use questions with a note stating that her students were too young to use the Internet.

Interviewed teachers were asked why they selected the Internet over traditional teaching and if they had any additional comments about using the Internet that they would like to share. Teachers talked about how students liked going to the computer lab, the need to teach students how to use the Internet safely, the need not only for technical support in the classroom but to encourage other teachers to use the Internet, and how the Internet will one day help create a classroom without textbooks.

A common element discussed by interviewed teachers was that students liked going to the computer lab and this enjoyment led to the teachers becoming excited about finding activities that the students would want to do. A teacher with limited computer lab space had her students work in teams and felt that besides learning the subject the students were learning team building skills. Teachers found the Internet to be an invaluable tool, which motivated students and helped to add variety to their teaching strategies. The Internet allowed hands-on activities that made learning a lot more interesting. Teachers felt that going to sites where students can see pictures and video clips helped students better understand concepts that they were studying. Interviewed teachers in rural areas or schools with limited library resources added that the Internet opened the world to their student. The Internet allowed students to explore places that they had never seen and through virtual reproductions of past events witnessed history. Interviewed teachers mentioned that their schools were in small rural communities and that the students had limited resources. The vast Internet resources allowed students to find more information than was available in the school's library.

Interviewed teachers agreed that students needed to learn the proper use of the Internet including various search engines' protocols. A 9th grade teacher felt that her

students knew how to type in ISeeU and type text messages but they had very little concept about what the Internet could actually accomplish for them. Other teachers warned about watching students very closely because students can accidentally get into inappropriate websites. Teachers restricted where students could go by creating a worksheet with websites for them to use. A high school teacher was concerned with students being able to identify legitimate websites and developed a website evaluation form which students completed for each website used in a research paper. Using these forms students had to find the site's author, domain, and last updated information.

Conclusions

Today's student can read Blogs by American soldiers in war zones to find the most current news, download their favorite movie, or visit a zoo online. Parents who are miles from their children can help them with homework through the use of instant messaging and emails. With webcams long distance divorced parents can be involved with their children's activities. As more and more uses are found for the Internet school administrators must become aware of the Internet's endless possibilities for instruction.

The Internet affects the everyday lives of students and has been called the educational equalizer (Shelly et al., 2005), as the Internet gives equal opportunity to all students. However, this study found that teachers in schools with free or reduced lunch percentages over 25% did not use the Internet the most to have their students participate or use online activities. An interviewed teacher stated that she did not give work requiring the use of the Internet because many of her students do not have Internet access at home. Other teachers indicated that their school only had dial-up connection which was too slow to have students complete interactive activities.

The Internet prompted a rapid expansion of computers in P-12 schools and in 2005 there was at least one computer with Internet access in 97% of the public schools in West Virginia. However, this study like previous research found that the Internet was primarily used as an informational access tool, and its potential as an innovative learning tool was largely unrealized (Becker, 1999; Gibson & Oberg, 2004; Wilson et al., 2003). Professionally the Internet was used most often by respondents to find supplemental information for lessons, find lesson plans, and communicate with experts or other teachers. Instructionally the Internet was used most often to have students find information and/or resources, read about current events, and access online encyclopedias or dictionaries. On a positive note, interviewed teachers demonstrated tremendous potential for using the Internet innovatively both professionally and instructionally.

Interviewed teachers indicated that they used a variety of search engines such as Google and Ask to find lesson plans and supplemental material for their lessons. Teachers used Discovery.com for science and health lessons and Historychannel.com for social studies lessons. Lesson plans found on the Internet are adapted to meet the needs of their students, to use the resources they have on hand, and/or to meet West Virginia Content Standards and Objectives.

Interviewed teachers indicated that they spent between 10 to 30 minutes a day to look for lesson plans. Time spent looking for supplemental information for lessons varied according to type of lesson. For example, an elementary physical education teacher averaged 10 minutes a day for one activity, a social studies teacher preparing a PowerPoint presentation that he will use for a one-week unit spent between 5 and 10

hours looking for supplemental information for the unit, and a special education teacher spent 2 hours looking for materials and completing a project.

Many of the interviewed teachers believe that the Internet is an invaluable 21st Century tool. One middle school teacher explained that because adopted textbooks do not cover all of the West Virginia Content Standards and Objectives, teachers needed the Internet to find supplementary material. Another middle school teacher went further to say that he could see a day when only the teacher would have the basic textbook as a resource and students would use the Internet to download their assignments. All of the interviewed teachers seemed to feel that the Internet was a viable tool for both professional and instructional use.

Implications for Action

The low level of Internet use as an instructional tool across all content areas shows a need for more professional development that focuses on strategies for integrating the Internet into the curriculum. Several *Surveys* were returned with notes from teachers stating that they were teaching pre-school or kindergarten students who were too young to use the Internet. This shows that there is definitely a need for Internet activities to be demonstrated at various pre-school and primary level professional meetings as well as the need for teacher preparation programs to model Internet use in all content instructional courses including early childhood education.

Since this study showed that teachers who had taken an online course or participated in one of the West Virginia Internet initiatives used the Internet more as a professional and instructional tool, online and long-term professional development should be created. Teacher preparation programs at various higher education institutions in West

Virginia may want to develop courses that are Web-enhanced or Web-based to help model examples for integrating the Internet.

Action also needs to be taken to provide more hardware technical support for teachers. Teacher mentoring programs for technology integration need to be formed at the school level so that teachers can help one another solve technical problems. School policies related to the use of the Internet need to be reevaluated, for example, students in foreign language classes need to be able to use email to correspond with students in other countries.

Recommendations for Further Research

Based upon the findings from this research, the following recommendations are made for further study:

1. The West Virginia Department of Education's Office of Technology is in the process of matching Internet websites with the West Virginia Content Standards and Objectives, which should give West Virginia teachers greater resources and methods for integrating the Internet into their classrooms. Therefore, this West Virginia Internet study could be a benchmark and repeated in five years to see what activities have gained in the extent to which teachers are using the Internet.
2. The Internet integration examples given by interviewed teachers added a more in depth picture regarding the extent to which West Virginia teachers are using the Internet as a professional and instructional tool. Therefore it is recommended that a purely qualitative study be completed to provide more information on methods of integrating the Internet into the curriculum and those factors that limit integration.

3. Participants who had participated in one or more of the West Virginia Internet initiatives used the Internet more than the participants who had not. Yet, the number of professional development hours in the use of the Internet did not significantly affect the use of the Internet. Therefore, further study into the affects of various long term professional development is recommended.
4. Participants who had taken an online course used the Internet more as a professional and instructional tool. Therefore further study of the impact of online courses on the use of the Internet would add to the knowledge base on what affects use of the Internet in the classroom.

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APPENDICES

Appendix A: Survey

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APPENDIX A: SURVEY

West Virginia Teachers' Internet Usage Survey

West Virginia Teachers' Internet Usage Survey

PART I: INTERNET USAGE

**Choose the response option that best describes your current Internet usage.
Please do not leave any unanswered items.**

To what extent do you use the following?	Daily	Weekly	Monthly	Quarterly	Yearly	Don't Know/Use
Section (A) As a Professional tool, I use the Internet to:						
1. Find lesson plans	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Find supplemental information for lessons	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Post lecture notes or assignments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Create or update class or school Web page(s)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Communicate with parents	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Communicate with students	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Communicate with experts/teachers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Participate in educational online discussions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Participate in educational online chat rooms	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Instant message in an educational environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Section (B) As an Instructional tool, I have my students use the Internet to:						
11. Participate in Web-based scavenger hunts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Participate in WebQuest projects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Communicate with content experts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Access lecture notes or assignments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Access online course materials	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Access an online library	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Publish multimedia projects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Participate in virtual tours	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. Utilize educational interactive websites	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. Access audio and/or video clips	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. Find information and/or resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. Participate in an electronic conference	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. Communicate with other students	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. Access online encyclopedias or dictionaries	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. Use online tutoring or homework helpers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26. Read about current events	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27. Read digital books online	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28. Participate in a Weblog/Blog	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29. Participate in a Wiki	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30. Communicate with students from another culture	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please check all of the West Virginia Internet initiatives that you have participated in:

- | | | |
|---|--|---|
| <input type="checkbox"/> Trek21 | <input type="checkbox"/> The Solution Site (Phase 9) | <input type="checkbox"/> World School Project |
| <input type="checkbox"/> RuralNet Project | <input type="checkbox"/> IBM Reinventing Education Project | <input type="checkbox"/> SAS inschool |

Part II: DEMOGRAPHICS

Please indicate the response that **best** describes you and your **current** teaching position.
Please do not leave any unanswered items.

Gender: Male Female **Age:** _____

How many years teaching: 1-5 yrs 6-10 yrs 11-15 yrs
(Including this year) 16-20 yrs 21-25 yrs 26+ yrs

Grade(s) taught: (check all that apply) P-2 3-5 6-8 9-12

Subject(s) taught: (check all that apply)
Self-contained classroom English Science
(Multiple subjects) Foreign Language Social Studies
Fine Arts Math Special Education
(Art, Drama, Music, Theater) Physical Education Other: _____
Business Reading

Do you assign work requiring your students to use the Internet? Yes No

How did you obtain your Internet knowledge? (check all that apply)
College/University course Commercial computer course
Self-taught Professional development
Friend(s)/Peer(s) Other: _____

Have you taken an online course? Yes No

During the 2004-2005 school year, approximately how many hours of professional development did you receive in using the Internet?

None Less than 5 hrs 5-10 hrs 11-15 hrs 15+ hrs

Do you have Internet access at home? Yes No *If yes, how is it connected?*
Dial-up DSL Cable

Do you have Internet access in a computer lab? Yes No *If yes, how is it connected?*
Dial-up Cable T-1 (WVNET) 56 KB (WVNET) Don't know

Do you have Internet access in your classroom? Yes No *If yes, how is it connected?*
Dial-up Cable T-1 (WVNET) 56 KB (WVNET) Don't know

Please check the one item below you feel is the greatest barrier to using the Internet for professional or instructional use?

Limited planning time
Limited professional training on using the Internet
Limited Internet resources
Internet connection speed
Other: _____

What percentage of the students at your school receives free or reduced lunch?

Below 25%
Between 25% and 50%
Between 50% and 75%
Above 75%

Thank you for participating in this survey.
If you are unable to locate the return envelope, please mail to:
Sandi Orr
5307 Ash Brook Road
Cross Lanes, WV 25313

APPENDIX B: INTERVIEW CONTACT INFORMATION

Interview Contact Information

I am looking for examples of how teachers are using the Internet as a professional and instructional tool. If you would like to share your experience in integrating the Internet by participating in a phone interview please fill out this page and include it with your survey. Please accept my gratitude in advance for your cooperation.

Name

Address

Phone _____ E-mail _____

The best day and time to contact me is: _____

Thank you,

Sandra Orr
5307 Ash Brook Road
Cross Lanes, WV 25313
304-776-5462

APPENDIX C: DEFINITIONS OF TERMS

Definition of Terms

Acceptable Use Policy (AUP)	A set of rules that governs the use of school computers, networks and the Internet/Web
Audio Clip	Segment of digitized music, speech or sound effects
Blog	Also known as a Web log or journal posted on the Internet
Broadband	Technologies that transmit signals at much faster speeds than traditional network configurations
Chat	Real-time typed conversations that take place via the Internet
Constructivism	Educational theory based on a type of learning where the learner forms, or constructs much of what he/she learns
Cooperative learning	Where students work collaboratively in groups to achieve learning objectives and goals
DSL	Digital Subscriber Line is a digital point-to-point technology that offers high speed transmission over standard telephone wiring. A benefit is that people can use their phone and access the Internet at the same time.
Dial-up	Connection to the Internet using a computer and a modem to dial into the Internet Service Provider or online service over regular telephone lines
Discussion Board	See message board
E-books	A digital form of a book on a CD or downloaded via the Internet
E-magazines or e-zines	A digital form of a magazine published on CD or the Internet
E-mail	An electronic form of communication where messages and files are exchanged to and from computers via a network or the Internet
ePALS/KeyPals	Services designed to enable students to interact with other students through e-mail
File Transfer Protocol or FTP	A transfer protocol that allows the exchange of files with other computers over the Internet
HTML	Hypertext Markup Language, set of special codes, called tags,

used to create and format Web pages

Hyperlinks or links	Text or graphics within an electronic document that when selected causes the display of another file or Web page, or plays audio or videos clips
Internet or Net	A worldwide collection of networks that link together millions of businesses, governments, educational institutions, and individuals using various communication devices and media
ISP	Internet Service Provider, an organization that has permanent connection to the Internet and for a fee provides temporary connections to individuals and companies
IM or IMing	Instant messaging enables two or more people to exchange messages in real time
LISTSERV	An mail account that resides on a subscriber's server and when one person sends a message to the email account every subscriber receives a copy of the message
Mailing lists	Group of e-mail addresses given a single name, which enables the user to send the same message to all addresses in the list
Message boards	Discussion groups within a Website that do not require a newsreader
Modem	A contraction of MODulator/DEModulator, a modem is a device that enables two computers to communicate over some type of communication line Analog modem , communication device that converts digital signals into analog signals, enabling computers to communicate Cable modem , communication device that connects to the computer via an Ethernet port, which is an always-on connection
Multimedia	A combination of text, color, graphics, animation, audio, video, and virtual reality
Newsreader	A program that enables access to a newsgroup to read previously entered messages, add articles and keep track of articles that the user has read
Objectionable Material	Materials on the Internet are classified as objectionable by the users; most people consider pornographic, racist or controversial literature, and Websites that contain incorrect materials to be inappropriate for K-12 students

Problem-based Instruction	Instruction in which students use background information to begin to solve and understand complex problems
Project-based Instruction	Instruction that focuses on creating learning opportunities for students by engaging them in real-world projects where they have an active role in completing meaningful tasks and constructing their own knowledge
Scavenger Hunt (on the Web)	An activity in which students explore the resources of the Web to find the answers to teacher-created questions
Simulations	Computer-based models of real-life situations
URL	Uniform Resource Locator, the unique address of each Website in a Website, for example http://www.parie.org/Musees/Louvre/Treasures/ will access the Treasures of the Louvre homepage
Usenet	Collection of Internet newsgroups
Video Clip	A segment of a digitized video
Video Conferencing	A live conference between two or more people using a computer, video camera, and network such as the Internet
Virtual Reality	Use of a computer to create an artificial environment that appears like a real environment and allows a person to explore and manipulate the setting
Virtual Tours	A digital tour of a location using images, audio/video clips and other media
Web, WWW	World Wide Web, which is a collection of electronic documents on the Internet that have built-in hyperlinks to other related documents
Web page	Electronic document viewed on the Web
WebQuest	Teacher created Web page with various links for students to click on to access information to solve a quest or task
Weblog	See Blog
Wiki	An extension of a weblog or blog that is designed for group collaboration

APPENDIX D: PANEL OF EXPERTS

Panel of Experts

Dixie Billheimer
Assistant Professor
Marshall University Graduate College
South Charleston, West Virginia

Rebecca Butler
Director of Technology
Kanawha County Schools
Charleston, West Virginia

Deborah Clark, NBCT
Coalfield Rural Systemic Initiative, Co-director
Appalachia Educational Laboratory
Charleston, West Virginia

Andy Haynes
Technology Coordinator
Clay County Schools
Clay, West Virginia

Donna Landin
WVDE/IBM Reinventing Education, Coordinator
West Virginia Department of Education
Charleston, West Virginia

Michael Murphy
Computer Services
Marshall University Graduate College
South Charleston, West Virginia

Christina Sampson
Professor of Education
Wheeling Jesuit University
Wheeling, West Virginia

Lethea Smith
Assistant Professor of Education
Concord University
Concord, West Virginia

Kimberly Sigman
Curriculum Specialist
Putnam County Schools
Winfield, West Virginia

Dr. Brenda Wilson
Associate Professor of Education
West Virginia State University
Institute, West Virginia

APPENDIX E: QUESTIONS

Content Validity Questions for Panel of Experts

Questions for Panel of Experts

1. Will the words be uniformly understood?
2. Do the questions contain abbreviations or unconventional phrases?
3. Are the questions too vague?
4. Are the questions biased?
5. Are the questions objectionable?
6. Are the questions too demanding?
7. Are any of the questions a double question?
8. Do the questions contain a double negative?
9. Are the answer choices mutually exclusive?
10. Do any of the questions assume too much knowledge on the part of the respondents?

(Smith & Glass, 1987, p. 248)

APPENDIX F: IRB APPROVAL LETTER



Office of Research Integrity
Institutional Review Board

Thursday, February 09, 2006

Lisa A. Heaton, Ph.D.
Education and Professional Development
100 Angus E. Peyton Dr.
South Charleston, WV. 25303

RE: IRB Study # 7029 At: Marshall IRB 2

Dear Dr. Heaton:

Protocol Title:
West Virginia Teachers' Internet Usage Survey

Expiration Date: 2/8/2007
Our Internal #: 2087
Type of Change: (Other) Expedited
Expedited ?:
Date of Change: 2/9/2006
Date Received: 2/9/2006
On Meeting Date: 1/18/2006

Description: In accordance with 45CFR46.110, the above listed study was granted expedited approval for a period of 12 months. This study is for student Sandra Orr. A progress report of this study is due prior to the anniversary date of February 8, 2007 or upon completion and or closure if prior to the anniversary date.

The purpose of this study is to determine the extent to which the internet is being used by West Virginia teachers.

Respectfully yours,

Stephen D. Cooper, Ph.D.
Marshall University IRB#2 Chairperson

APPENDIX G: COVER LETTER FOR SURVEY

Cover Letter for Survey

5307 Ash Brook Road
Cross Lanes, West Virginia, 25313
November, 2005

Dear West Virginia teacher,

You have been selected to participate in this doctoral research study as part of a random sampling of West Virginia teachers. The purpose of this study is to investigate the extent to which the Internet is being used by West Virginia teachers and to identify examples of successful integration of the Internet within the classroom.

I hope that you will set aside a few minutes to complete the enclosed survey. Understanding the constraints upon your time, I have limited the survey to only two pages, which should take only a few minutes to complete. Even if you are not an Internet user your responses are vital to the study. Participation is voluntary, and your responses are confidential. Data will be securely stored and will be reported in aggregate form only with no identification of individual respondents. Your responses are very important, and your timely participation will greatly strengthen my research. However, there is no penalty for declining to participate in this study.

Please answer the questions as honestly and accurately as possible. I am requesting that all responses be returned by March 8, 2006. Enclosed you will find a preaddressed stamped envelope for your mailing convenience. If you would like to share examples of your use of the Internet by participating in a phone interview please complete the Interview Contact Information page and return it with your survey. If you should choose to include your name or agree to an email or phone interview, your name and school will remain confidential. Returning the completed survey indicates your consent for use of the answers you supply.

Please keep this letter for your records. If you have any questions or would like further information on this study, you may contact me at 304-776-5462. If you have questions about your rights as a research subject, you may contact Dr. Stephen Cooper, IRB#2 Chair, at the Office of Research Integrity at Marshall University at 304-696-7320. Please accept my gratitude in advance for your cooperation and timely participation in this research study.

Sincerely,

Sandra Orr

APPENDIX H: POSTCARD REMINDER

Postcard Reminder

Two weeks ago a survey seeking your use of the Internet was mailed to you. Your name was randomly drawn from a list of all West Virginia teachers.

If you have already completed and returned the survey, please accept my sincere thanks. If not, please do so at your earliest convenience. I am especially grateful for your help.

If you did not receive a survey, or if it was misplaced, please call me at 304-776-5462 or email me at sandiorr@charter.net, and I will get another one in the mail to you.

Sandra Orr

APPENDIX I: SECOND COVER LETTER

Cover Letter for Second Survey Mailing

Cover Letter for Second Survey Mailing

5307 Ash Brook Road
Cross Lanes, West Virginia, 25313
November, 2005

Dear West Virginia teacher,

A few weeks ago you were sent the *West Virginia Teachers' Internet Usage Survey*, a research study aimed at investigating the extent to which the Internet is being used by West Virginia teachers. You were selected to participate in this study from a random sampling of public school teachers across West Virginia.

If you have already completed and mailed the survey back please excuse this reminder. If you have not had the opportunity to complete the survey, I am asking that you spend a few minutes to do so now. I realize that your time is precious. The enclosed survey will only take a few minutes to complete. While participation is voluntary, your participation will greatly increase the strength of this study. Strictest confidentiality will be maintained throughout the study. Data will be securely stored and reported in aggregate form only, with no identification of individual teachers.

Please find enclosed another survey along with a preaddressed stamped envelope for your mailing convenience. I would greatly appreciate it if this survey were returned by April 5, 2006. If you should choose to include your name or agree to a phone interview, your name and school will remain confidential. If you have any questions, you may contact me at 304-776-5462. If you have questions about your rights as a research subject, you may contact Dr. Stephen Cooper, IRB#2 Chair, at the Office of Research Integrity at Marshall University at 304-696-7320.

Once again, thank you in advance for your participation and timely response in this research study.

Respectfully,

Sandra Orr

APPENDIX J: INTERVIEW GUIDE

Interview Guide

Goal: To describe West Virginia teachers' experiences in finding, creating, and using Internet resources for professional and instructional activities.

Focus: find, create, prepare (time), and use

Questions (*Depending on the interviewee not all questions may be asked*):

1. Is this a good time for you? (if yes, continue; if no ask what a good date and time would be) _____

The purpose of this follow-up interview is to gain more information on how you are using the Internet as a professional or instructional tool. I have a list of questions that I would like for us to focus on.

2. You indicated that you would like to share information about your use of the Internet. What aspect of using the Internet would you like to share?

If professional use, go to question 3 and select appropriate questions

If instructional use, go to question 4 and select appropriate questions

3. If professional use, ask the following questions:

Name of activity:

How did you find resources for this activity?

How much time did it take for you to prepare for this activity?

How did you use the activity?

How was the Internet accessed?

What was the total time spent on this activity?

Why did you elect to use of the Internet for this activity?

4. If instructional use, ask the following questions:

Name of activity:

How did you find resources for this activity?

How much time did it take for you to prepare for this activity?

How did you use the activity?

How was the Internet accessed?

What was the total instructional time?

Did you assess the students in this activity?

If yes, how did you assess?

How well do you feel the activity went?

Why did you elect to use the Internet versus traditional teaching methods for his activity?

5. Do you have any comments about using the Internet that you would like to add?

APPENDIX K: INTERVEIWED TEACHERS MATRIX

Interviewed Teachers' Matrix

Years of Teaching Experience

Grade Taught	1-10	11-25	26+
P - 2	F - Pre-K *	F - Sp. Ed.* F - 1st Grade*	
3 - 5		M - P.E./Tech * F - 4th Grade* F - 3rd Grade	F - 3rd Grade F - 3rd Grade* F - 3rd Grade*
6 - 8	F - English	F - English* F - Sp. Ed F - Fine Arts	M - 6th Grade*
9 - 12	F - Family CC* F - Agriculture M - Science/SS*	F - Marketing* F - Business*	M - Fine Arts F - Foreign Language*

*Interviewed

Note: Female with 16-20 years of experience did not list grade taught

CURRICULUM VITAE

**CURRICULUM VITAE
SANDRA LEE ORR**

EDUCATION

Marshall University
Doctor of Education in Curriculum and Instruction, 2006
Marshall University
Education Specialist, 2004
University of Oklahoma
Masters of Natural Science, 1970
University of Oklahoma
Bachelor of Science in Math Education, 1967

CERTIFICATION

Appalachian State University, 1992
Developmental Education Specialist Certification

PROFESSIONAL EXPERIENCE

2000-Present Associate Professor Department of Education, West Virginia State University,
1988-2000 Director of Developmental Mathematics, West Virginia State Technical and Community College
1972-1974 Teacher, Fredrick County School District, Fredrick, Maryland
1970-1971 Teacher, Arundel County School District, Annapolis, Maryland
1967-1968 Teacher, Spring Branch School District, Houston, Texas

HONORS AND RECOGNITION

2002 NASA Pre-Service Teacher Conference Appreciation Plaque
1996-1997 West Virginia Mathematical Association for Two Year Colleges, President
1995 Outstanding Educator of the Year, West Virginia Association for Developmental Education
1995-1996 Mentor of the Year, West Virginia State College
1991 West Virginia State College System Scholarship to the Kellogg Institute
1984-1986 Cross Lanes Junior Woman's Club, President
1981-1983 Cross Lanes Branch of the Association of University Women, President
1968 National Science Foundation Grant, Texas Christian University