

Arthur Langer

Students and Technology

1. Association for Applied Interactive Multimedia (AAIM): <http://www.aaim.org>.
The Association for Applied Interactive Multimedia was established in 1992 with the purpose of creating a professional organization to support the use and development of interactive multimedia for education and training. The membership of the organization consists of K-12 teachers, higher education professionals, education material designers, educators in government and healthcare, multimedia developers, technology, e-Commerce, and information professionals.
2. Bauer, Hilaria. (2006). The relationship between technology integration, reading instruction and reading achievement in high-performing campuses as reported by PEIMS and third grade classroom teachers in selected south Texas school districts. (Doctoral Dissertation, Texas A&M University, 2006). *Proquest Dissertations and Theses, 0514, 0803*.

This dissertation study investigated the relationship between the implementation of technology in a third grade classroom and standardized reading test scores. Furthermore, the researcher explored teachers' technology awareness and their ability to integrate technology in the classroom to increase literacy levels.

The study was conducted using quantitative correlational techniques on 100 teachers across four South Texas school districts. The results of the study have pedagogical implications; the findings revealed a positive relationship between teacher skill level and level of technology integration in the classroom. In general, the participants used technology to fulfill administrative responsibilities and communication requirements, instead of enhancing pedagogy. Teachers' responses provided insight to the reasons behind the varied levels of technology use across the districts. Lastly, they revealed their familiarity and willingness to integrate technology in their pedagogy. Recommendations to integrate technology in the classroom for districts and schools are presented.

3. Dugger, William E. Jr. (2007). The status of technology education in the United States. *The technology teacher*. September 2007, pp. 14-21.

The article presents results from a research study conducted from 2006 to 2007 on the status of technology education in the United States. The study was conducted by the International Technology Education Association (ITEA). ITEA had conducted a similar survey in 2000 and 2003.

Surveys were sent to technology education supervisors across the United States. Forty-six states responded to the survey. Overall, compared to previous years, the 2006 to 2007 survey revealed a larger number of states had integrated technology within their educational frameworks. However, the same number of states requiring technology education in its curriculum remained the same since 2004.

States report mixed results when asked about the use of technology standards; some used them on an ad-hoc basis, while others have fully adopted the guidelines. Twenty-seven states reported that they have developed technology education curriculum guides, while 19 states did not. The study revealed a need for continued support for technology standards, such as Standards for Technological Literacy: Content for the Study of Technology (STL) and Advancing Excellence in Technology Education: Student Assessment, Professional Development and Program Standards (AETL).

Lastly, the study concluded that technology education is funded in a variety of ways; 20 out of 46 states received funding from local, state and federal levels. Eight states support their technology education entirely through local funding.

4. Groth, Lois A., Dunlap, Kristy L., and Kidd, Julie K. (2007). Becoming technologically literate through technology integration in PK-12 pre-service literacy courses: Three case studies. *Reading Research and Instruction*. 46(4), pp.363-386.

The study observed 69 K-12 educators (i.e. pre-service teachers, literacy instructors and practicing teachers) in their approaches to integrate technology into literacy method courses; the case study approach was used to collect data from the educators. Findings were separated into three case studies including: (1) curricular applications of technology in early childhood education; (2) curricular applications of technology in elementary education; and (3) curricular applications of technology in secondary education.

Results indicate that there is a need to develop teacher educators' knowledge, skills, and confidence in using technology. These factors influence the educators' level of comfort and willingness to integrate technology in their teaching.

5. Kallick, Bena and James, Wilson M. (2000). *Information technology for schools: Creating practical knowledge to improve student performance*. Jossey-Bass: San Francisco.

Kallick and James' book on information technology for schools provides practical examples in using technology to improve the learning environment, school infrastructure and learning outcomes. The authors discussed the challenges of planning integrated information systems; using data to drive decision making is also discussed.

The book offers guidelines to assess and monitor progress in using technology in curriculum and pedagogy. Furthermore, it offers successful strategies to integrate technology in the classroom. The book suggests that higher levels of student performance can be achieved through carefully planned integration of technology in the classroom.

6. National Center for Technology Planning: <http://www.nctp.com/>

The website for the National Center for Technology Planning (NCTP) serves as a repository of information related to technology planning for schools. The National Center for Technology Planning is a clearinghouse for information related to technology planning, including school technology plans, technology planning aids (checklists, brochures, sample planning forms, PR announcement forms), and electronic monographs.

The organization's goals are to collect, disseminate and assist with technology planning. Most of the data collected are from school districts and other organizations around the world. Technology plans are available on the website for downloading.

7. Pearlman, Bob. (2006). Twenty-first century learning in schools: A case study of New Technology High School in Napa, California. *New directions for youth development*. 110, pp. 101-112.

Pearlman presents a school in California, the New Technology High School (NTHS), which utilizes technology to engage students in project based learning. New Technology High School was founded in 1996 with the following learning outcomes: content standards, collaboration, critical thinking, oral communication, written communication, career preparation, citizenship and ethics, and technology literacy. These learning outcomes were embedded in all facets of the classroom.

Technology plays an important role in NTHS classrooms. Through the school's network, students can learn through research tools, communicate and collaborate with subject matter experts, and enhance their learning by engaging with various technological tools (i.e. PowerPoint, Lotus Notes, media, etc.). Technology, as used in NTHS, has enabled students to research, plan and communicate. As a result, students reported positive outcomes including feeling safer, more challenged, engaged, and motivated for post-secondary learning.

8. Popejoy, Katherine. (2007). The impact of technology on teaching and learning in an elementary science classroom. (Doctoral Dissertation, University of British Columbia, 2007). *Proquest Dissertations and Theses*, 2500, 0524.

This dissertation study investigated the use of technology, particularly eight desktop computers, in a 4th and 5th grade science classroom. Specifically, Popejoy studied how the use of technology tools enhanced instruction in the classroom and outlined factors that assist its use as an imaginative extension of the learning environment.

This qualitative study revealed that technology fostered an open learning environment where the students became engaged with the subject matter. The instructor's teaching and the student's learning practices were altered as a result of the integration of technological tools in the classroom. The desktop computers served as a gateway for enriching information and experience for the classroom.

9. Page, Michael Shawn. (1999). A comparison of student achievement, self-esteem, and classroom interactions in technology-enriched and traditional elementary classrooms with low socioeconomic students. (Doctoral Dissertation, Louisiana Tech University, 1999). *Proquest Dissertations and Theses*, AAT 9948312.

This dissertation study compared the outcomes of technology enriched elementary classrooms to traditional elementary classrooms in terms of student achievement, self-esteem and interaction. The study was conducted in five Louisiana elementary schools.

The researcher utilized various instruments to measure student outcomes, including Iowa Tests of Basic Skills (ITBS), the California Achievement Test (CAT), the Coopersmith Self-Esteem Inventories (CSEI), and the Flanders Interaction Analysis System. The sample was composed of 211 students from low socioeconomic status of various racial backgrounds and ability levels.

The results of the study indicated that the presence of technology tools in the classroom had a positive influence on mathematics achievement of the low socioeconomic elementary school students. Classroom technologies encouraged student-directed learning and had positive effects on student self esteem. The results from the reading achievement instrument were inconclusive.

10. Taylor, Julie Anne and Duran, Mesut. (2006). Teaching Social Studies with technology: New research on collaborative approaches. *History Teacher*. 40(1), pp. 9-25.

The authors describe the Michigan Teachers' Technology Education Network (MITTEN) and its mission to enhance the use of technology in social studies programs in the K-12 classrooms. The MITTEN project was a four year program, with over 250 teacher participants between 2001 and 2005.

The MITTEN project promoted the use of technology in the classroom through the use of Internet, search databases and primary sources for research and computers to create newspapers of historical periods. Students who engaged learning through the use of technological tools showed greater interest in the content. They also scored higher on social studies exams, compared to the students who did not have access to such tools.

11. Taylor, Lydotta M., Casto, Donna J., Walls, Richard T. (2007). Learning with versus without technology in elementary and secondary school. *Computers in Human Behavior*. 23(1), pp. 798-811.

The empirical study sought to investigate the differences in learning with and without technology in the same curriculum-relevant subject matter in elementary and secondary schools. This study served to validate the Technology Innovation Challenge Grant Program.

Subject matter topics were selected by teachers from <http://wwwthesolutionsite.com>, covering grade relevant learning materials. Results from the study showed a greater pre-test to post-test gains from students when the subject matter was integrated with appropriate technologies as compared to no integration.

12. Teachers College Record: <http://www.tcrecord.org>.

The Teachers College Record is an educational journal of research, analysis, and commentary. It has been published by Teachers College, Columbia University since 1900. The journal covers a broad range of topics including administration, adult education, social context, counseling, curriculum, early childhood education, teacher education, technology, etc. Access to journals and related resources are available on the website.

A section of the journal is devoted to technology pertaining to the classroom, distance learning, technology education, publishing and communication. The website also provides reviews of the latest publications.

13. Young, Thomas A., Cole, Jonathan R., Denton, Denise. (2002). Improving technological literacy. *Issues in science and technology*. 18(4), pp. 73-79.

The article explored the gap between technology and technological literacy. The large gap between technological advancements and technology education in K-12 creates a challenge for policy makers. There is a lack of legislation which addresses the use of computers and related tools for education. The article defined technology, expressed the importance of technology literacy, and provided suggestions for K-12 educators to improve technological literacy.

According to the authors, technology is the process and the knowledge by which humans create, innovate and improve nature to meet their needs and desires. Technological literacy includes three dimensions: knowledge, ways of thinking and acting, and capabilities. The three dimensions vary depending on environment and culture.

The authors suggested that technological literacy should be improved at schools, where early exposure and hands-on experiences are provided. The U.S. trails other countries such as France, Italy, Japan, Taiwan, and the U.K., where technology education is required in middle and high school. In the U.S., only 14 schools require some form of technology education. The article suggests the following improvements: (1) establish federal and state legislature to include technology education; (2) offer teacher training and education in technology and related tools; (3) create of infrastructure and programming to include technology education; and (4) increase the knowledge base regarding the use and importance of technology.

Teaching/Pedagogy and Technology

1. Crisan, Cosette, Lerman, Stephen and Winbourne, Peter. (2007). Mathematics and ICT: A framework for conceptualising secondary school mathematics teachers' classroom practices. *Technology, Pedagogy and Education*. 16(1), pp. 21-39.

This empirical case study explored the relationship between content knowledge and pedagogy when secondary school mathematics teachers use information and communication technologies (ICT). The researchers collected data from seven teachers through interviews, classroom observations, and teachers' writing samples.

The analysis of the data revealed contextual and personal factors salient to teachers when using ICT in the classroom. These factors were key indicators of their comfort in using ICT in mathematics teaching. The results contribute to the understanding of teachers' use of ICT in the classroom by treating pedagogy and ICT usage as interdependent factors in practice.

2. Dias, Laurie Brantley. (2000). Best practices of technology integrating teachers: Pictures of practice from four elementary classrooms. (Doctoral Dissertation, Georgia State University, 2000). *Proquest Dissertations and Theses, AAT 9978929*.

Dias' dissertation explored how and why teachers might integrate technology in their classroom practices. This qualitative study addressed three questions: (1) how are elementary teachers, identified as technology integrators, practicing technology integration; (2) why are they practicing technology integration; and (3) what are their beliefs about technology integration.

Four elementary teachers in grades 3, 4 and 5 in a large metropolitan southeastern U.S. city were selected to participate. The researcher observed, interviewed, and reviewed relevant documents to gather data.

The results indicated that technology was an important part in the classroom. Teachers who were successful in the integration of technology in their classroom also practice effective pedagogy. Pedagogical best practices and technology best practices appear to be related.

Results indicated that instructional uses of technology influence student outcomes. Technology fluency in teachers and students was identified as an important and valued basic skill. Lastly, factors beyond the classroom impede the use of technology, such as personal belief factors.

3. Dussault, Marc, Deaudelin, Colette, and Brodeur, Monique. (2004). Teachers' Instructional Efficacy and Teachers' Efficacy toward Integration of Information Technologies in the Classroom. *Psychological Reports. 94*(3), pp.1375-1381.

The empirical study investigated the relationship between elementary school teachers' instructional efficacy and their efficacy toward integration of technology in their classrooms. The study was conducted in Canada, where 309 elementary school teachers volunteered in the study.

The teachers were administered a Teacher Efficacy Scale and Teachers' Efficacy Scale toward integration of technologies in the classroom. Statistical analyses concluded that there is a positive and significant partial correlation between instructional self efficacy and technology integration self efficacy beliefs.

4. Franklin, Cheryl. (2007). Factors that influence elementary teachers use of computers. *Journal of Technology and Teacher Education. 15*(2), pp.267-293.

This quantitative study examined how elementary teachers used technology for instructional purposes and the factors that influenced their use of computers. A survey instrument was administered to a group of recent graduates of a mid-Atlantic elementary teacher preparation program. The survey addressed four factors of computer use including: (1) access and availability, (2) preparation and training, (3) leadership, and (4) time.

Results indicated that a majority of the teachers felt very well to well prepared to integrate technology into the curriculum. They were comfortable in overcoming barriers to computer use in the elementary classrooms. The majority of the teachers believed in the educational potential of computing, allowing students to discover and create learning. The respondents indicated three factors that influence computer use in the classroom: teacher preparation, teacher philosophy, and grade level.

5. Hayes, Debra N. A. (2007). ICT and Learning: Lessons from Australian Classrooms. *Computers & Education. 49*(2), pp. 385-395.

This article presents a study of six public schools in Australia in an attempt to address the influences of information and communication technologies (ICT) on teaching and learning. Data was collected through teacher and key stakeholder interviews and classroom observations. The

goal of this study is to examine how teachers, in various contexts, use ICT in their classroom to enhance student learning.

Results indicated that ICT is largely integrated in the classroom to supplement existing practices and exercises. Researchers observed that successful integration of ICT requires changes in core activities, such as teaching, in the schools.

6. Hin, Tan Wee Leo and Subramaniam, R. Eds. (2006). *Handbook of research on literacy in technology at the K-12 level*. Idea Group Publishing: London.

The Handbook is a compilation of scholarly articles covering issues, methods and theories that define technology literacy at the pre-collegiate level. The handbook provides research and practice from 50 international experts.

Topics covered in the handbook include: digital literacy and globalization, Internet and online learning communities, knowledge management, communities of practice, technological tools, assessment of technological literacy, pedagogy and technology, and ethics and legal considerations.

7. Karchmer, Rachel A. (2001). The journey ahead: Thirteen teachers report how the Internet influences literacy and literacy instruction in their K-12 classrooms. *Reading Research Quarterly*. 36(4), pp. 442-466.

The study investigated the accounts of thirteen K-12 teachers in the United States who utilized Internet to influence literacy and literacy instruction in their classrooms. The participants were considered as exemplary in using technology by their community of practice. This qualitative study revealed three themes: (1) appropriateness of Internet material; (2) accuracy of Internet material; and (3) publishing student work on the Internet. Data was collected through email interviews, reflective journals, online articles, lesson plans and web pages.

Analysis revealed that the teachers perceived the Internet as an extension of traditional literacy skills. Elementary school teachers observed an increase of student motivation when their work was being published on the Internet for a wider audience. This was not the case for secondary school teachers. Further research in literacy and technology is suggested.

8. Koehler, Matthew J., Mishra, Punya, and Yahya, Kurnia. (2007). Tracing the development of teacher knowledge in a design seminar: Integrating content, pedagogy and technology. *Computers & Education*. 49(3), pp. 740-762.

The article elaborates on a semester-long investigation to define and conceptualize technological pedagogical content knowledge. This concept was based on the research of Lee Schulman who defined pedagogical content knowledge, the familiarity and interplay of content and pedagogy.

The researchers investigated technological pedagogical content knowledge through a faculty development design seminar, where faculty members and graduate students collaborated to develop online courses. Results of the analysis showed that the participants changed their initial perception of technology, pedagogy and content as three independent constructs. After fifteen weeks, the participants developed a richer conception of the three factors. The study concluded that technological pedagogical content knowledge is a multi-generational process involving the deep understanding of technology, pedagogy and content, and their complex relationships with the variety of contexts in which they exist.

9. Scheibe, Cynthia L. (2004). A deeper sense of literacy: Curriculum-driven approaches to media literacy in the K-12 classroom. *The American Behavioral Scientist*. 48(1), pp. 60-68.

Scheibe discusses how media literacy, when used effectively as an instructional approach for the K-12 curriculum, can promote critical thinking, communication, and technology literacy. Project Look Sharp at Ithaca College is discussed as a case study, where media is used in select classrooms in upstate New York. As a result, critical thinking and technology literacy is promoted.

The article describes the best practices and establishes basic principles behind the curriculum-driven approach. She supports her argument by presenting examples from social studies, English, mathematics, science, health, and art classrooms. Assessment methods to evaluate effectiveness are also discussed.

10. Taffe, Susan, and Gwinn, Carolyn B. (2007). *Integrating literacy and technology: Effective practice for grades K-6*. Guilford Press: New York.

This book's target audience is K-6 educators in a rapidly changing technology environment. It provides a step-by-step guide to decide, plan, teach, and assess a technology-rich classroom. Technology tools and their uses in the classroom to enhance reading and communication for students are presented.

The book has five goals including: (1) subscribe to a wide audience of educators in a range of technology-integration journey; (2) describe the decision-making process of literacy technology integration; (3) encourage practitioners to reflect and engage to present ideas and experiences; (4) suggest different strategies for educators to integrate technology in the classroom; and finally (5) provide value and impact in technology integration in the classroom.

11. Tomei, Lawrence, A. (2001). *The technology façade: Overcoming barriers to effective instructional technology in schools*. Allyn & Bacon: Boston.

The book contains a 20-question check list and specific how-to recommendations to assist educators select and implement appropriate technological tools for their schools. The checklist, called the Technology Façade Checklist, considers the human, financial, resource and instructional factors when selecting the technologies.

The Technology Façade Checklist is a diagnostic tool for the school's current technology program, and designed to provide strategies to improve. The book includes a technology plan, lesson plans, handouts, exercises, and case studies for K-12 educators and administrators.

12. Twidle, John, Sorensen, Peter, Childs, Ann, Godwin, Janet, and Dussart, Molly. (2006). Issues, challenges and needs of student science teachers in using the internet as a tool for teaching. *Technology, Pedagogy and Education*. 15(2), pp. 207-221.

This article investigates the issues, challenges, and needs of student teachers in using the Internet for teaching. In order to earn the Qualified Teacher Status in England, student teachers must master the use of Internet databases to support pedagogy. This article details the attitude and practice of student secondary science teachers; the hindering and promoting factors, and views of good pedagogy were investigated.

Results of the study show that most student teachers recognize the value of Internet use and its ability to promote learning. However, the lack of resources, technical difficulties, shortage of role models, and disparate information on the Internet hindered their use. Overall, there is a perception of limited information available on effective pedagogy.

13. Voogt, Joke, Almekinders, Marinus and Akker, Jan van den. (2005). A 'blended' in-service arrangement for classroom technology integration: impacts on teachers and students. *Computers in Human Behavior*. 21(3), pp.523-539.

The researchers present a blended approach to support secondary school teachers to integrate technology in their classroom. This blended in-service arrangement is comprised of workshops, exemplary curriculum materials, and computer mediated communication.

The article details two studies that used the blended in-service arrangement to support the integration of technology in the classroom. Both studies showed consistent results; the blended approach showed promising results for supporting integration of technology in education. However, results implied a disparate use of technology in the teachers' classrooms and in their daily routines; this presents a challenge to establish a community of practice.

14. Wiske, Martha Stone, Franz, Kristi Rennebohm, and Breit, Lisa. (2004). *Teaching for understanding with technology*. Jossey-Bass: San Francisco.

This book illustrates how educators use technological tools to improve student learning and scholastic achievement. The authors present the Teaching for Understanding framework, an educator's guide to encourage students to think, analyze, problem solve, and derive meaning of the material. The book suggests technological tools including Internet information, online curriculums, professional networks, learning goals, and lesson plans to enhance student understanding and develop communities of learners.

Schools (Infrastructure/Support) and Technology

1. ChanLin, Lih Juan. (2007). Perceived importance and manageability of teachers toward the factors of integrating computer technology into classrooms. *Innovations in Education and Teaching International*. 44(1), pp. 45-55.

This study investigated the perceived importance and manageability of teachers on the factors in technology integration. 407 elementary and secondary school teachers participated in this study consisting of a 28-item questionnaire rating the importance and manageability of various factors. The questionnaire focused on environmental, personal, social and curricular factors related to technology integration.

The results showed that the teachers' perceived importance of select factors was related with their manageability score for integrating technologies in classrooms. Furthermore, there exists a relationship between the teachers' use of computers and their perceived importance.

2. Ernst, Jeremy V., Clark, Aaron C. (2007). Scientific and technical visualization in technology education. *The technology teacher*. May/June 2007, pp.16-20.

The article describes the Visualization in Technology Education (VisTE) project, funded by the National Science Foundation, to promote the use of graphic visualization tools in grades 8-12. The project supports and fosters the ability of visualization to break down, problem-solve and communicate ideas and concepts. Through the project, students learn to conduct research, analyze and solve problems, and communicate effectively.

The VisTE curriculum consists of twelve units covering a range of topics including communications technology, imaging, biotechnology, transportation technology, modeling and animation, energy and power technology, bio-processing, prosthetics, weather, nanotechnology, biometrics and careers. The pilot study was conducted consisting of volunteers across the United States. The pre-assessment and post-assessment results from the teachers and students show a successful experience with the VisTE instructional materials. Test scores indicated content knowledge gains in each of the twelve units of the curriculum.

3. Eshelman, David S. (2007). Planning for technology in school facilities. (Doctoral Dissertation, Virginia Polytechnic Institute and State University, 2007). *Proquest Dissertations and Theses, AAT 3258797*.

The study investigated the challenges of planning for technology integration in existing, new or renovated schools. The goal of the study is to provide educators a technology profile to assist with planning issues in school design and integration of technology. The study was conducted in the Commonwealth of Virginia.

To develop the technology profile, the researcher conducted a review of the Virginia Educational Technology Alignment Report, the CEO Forum STAR indicators, the Florida Technology Resource Survey, and TAGLIT survey tool. The TAGLIT survey tool is used in Virginia to assess the current conditions and perceptions of educators with respect to technology planning and integration.

The results of the literature review showed a commitment to long term planning and Virginia's commitment to statewide integration of technology in teaching and learning. By developing a similar technology user profile for each school, key stakeholders can review the data to make informed decisions regarding technology and funding priorities.

4. Foster, Patrick N. (2005). Technology in the standards of other school subjects. *The technology teacher*. November 2005, pp.17-21.

This article by Patrick Foster explores the standards in several school subjects related to technology education content and standards. School subjects comprising the Science-Technology-Society model are discussed, and the proposal views technology as an interface between the social and scientific worlds. This article provides an overview of the science and social studies standards and illustrates the examples of how these standards can correlate to technology content.

There are a number of science and mathematics standards including: National Science Education Standards (1996), Science in Personal and Social Perspectives, Science and Technology Standards, Principles and Standards for School Mathematics. Social studies standards include: Curriculum Standards for Social Studies (NCSS, 1994) and National Geography Standard. These standards were compared to the Standards for Technological Literacy; the author concluded that there are substantial, perhaps necessary, overlaps in the standards in several fields of education. This presents opportunities to demonstrate how subject matter can be viewed from multiple perspectives and integrate traditional content areas.

5. LeBaron, John F., Collier, Catherine. (2001). *Technology in its place: Successful technology infusion in schools*. Jossey-Bass: San Francisco.

The book is a compilation compiles the studies and articles covering administration, strategic planning, leadership, curriculum and professional development when using technology for teaching and learning. . The purpose of the book is to promote effectiveness and alignment of leadership and practice with theory when using technology. The authors provide a high level overview of each topic and additional resources are available for further investigation.

The book is organized into two parts addressing curriculum and leadership. The authors believe that curriculum should drive technology integration. Support is required from the leadership to foster success in technology investments and related initiatives. The book's specific topics include: technology to enhance student inquiry; technology for urban schools; technology and learning; staff development for technology integration; international online learning; school leadership and technology; politics of technology transformation; corporate partnerships; and policy and ethics regarding technology.

6. National school Boards Association, Institute for the Transfer of Technology to Education (ITTE): <http://www.nsba.org/itte>.

Established in 1985 by the National School Boards Association, the Institute of Transfer of Technology to Education (ITTE) is committed to engage education, industry and policy makers to improve education through the knowledge and understanding of technology and organizational development.

The website provides information about technology leadership, conferences, legal and policy documentation and other technology-related resources.

7. Seymour, Celene. (2007). Information technology assessment: A foundation for school and academic library collaboration. *Knowledge quest*. 35(5), pp. 32-35.

The author presents a collaborative model, called Project SAILS (Standardized Assessment of Information Literacy Skills), to assess the outcomes of information literacy in college students. The project seeks to determine the effectiveness of instructional services and resources in developing information literacy, by correlating first year and graduation year skills, retention and academic success. The assessment measures information literacy skills, such as locating, evaluating and using information.

The article introduces two additional assessment tools, including Information and Communication Technology Literacy Assessment (ICT) and Tools for Real-Time Assessment of Information Literacy Skills (TRAILS). The ICT Literacy Assessment measures an individual's ability to use technology for a specific learning project. The TRAILS measures an individual's competency in applying information literacy skills.

There is an opportunity to introduce Project SAILS at an earlier pre-college level, such as middle and secondary schools. Data from the project can be used to influence instructional and program design. The author suggests opportunities and benefits for K-20 partnerships to enhance technology literacy. Some opportunities include: integrate K-20 standards to increase seamlessness, develop SAILS, TRAILS and ICT Literacy standards for middle and secondary school students, analyze results to identify opportunities for improvement, provide educational opportunities for students to reach targeted standards, etc.

8. Wenglinksy, Harold. (2005). *Using technology wisely: The keys to success in schools*. Teachers College Press: New York.

Wenglinksy's book provides research based evidence for effective use of instructional technology by presenting case studies of four schools. He employs quantitative and qualitative research methodologies to illustrate how these schools have used technology as a tool when taught through constructivist-based instruction.

The book presents quantitative data from the 1996 and 2000 National assessment of Educational Progress (NAEP) to support the author's claim that there is a positive association between science and mathematics scores and the use of technology in constructivist-based instruction. Furthermore, the author compares traditional and constructivist uses of technology, with quantitative data, to illustrate the lack of association between science and mathematics scores, the utilization of technology and traditional instruction. Suggestions for policy makers and practitioners are also presented.

9. Yasemin, Gulbahar. (2007). Technology planning: A roadmap to successful technology integration in schools. *Computers & Education*. 49(4), pp. 943-956.

The present study illustrates the technology planning process of a private K-12 institution in Turkey. Data was collected from the school population of teachers (105), administrative staff (25) and students (376) in the form of questionnaires and unstructured interviews. Teachers and administrative staff filled out a questionnaire to gather their perspectives on information and communication technology literacy and related issues. Data from questionnaires were validated through unstructured interviews with teachers and administrative staff. Students were asked to provide their perceptions of the school's utilization of ICT at the school.

Results showed that the teachers and administrative staff perceived competence in using ICT at the school. However, they reported a lack of guidelines to successful technology integration. Students reported a lack of ICT use in the courses. The results of the study were used to develop a technology plan for the school.