

**California State University San Marcos**  
**EDST 631-Impact of Technology on Teaching and Learning CRN 42415 3 Units**  
**Fall 2002**  
**5:00 – 7:45 Thursdays UNIV 439 and UNIV 360**

**Instructor: Dr. Joan Hanor**

**Office Hours: 1 - 3 p.m. Thurs. and by apt.**

**Contact Information: University Hall 220**  
**jhanor@ csusm.edu**  
**760.750.4305**

---

**Required Textbooks:** Bertrand, Yves. 1995. Contemporary Theories and Practice in Education.  
Madison, WI: Atwood Publishing.

McCain. T., & Jukes, I. 2001. Windows in the Future. Thousand Oaks, CA.: Corwin  
Press: Sage publications.

---

**Required readings located ONLINE:**

<http://www.sri.com/policy/ctl/assets/images/RoschelleEtAlPackard2000.pdf>

*Changing How and What Children Learn in School with Computer-Based Technologies*

Jeremy M. Roschell, Roy D. Pea, Christopher M. Hoadley, Douglas N. Gordin, Barbara M. Means

*Transforming Learning with Technology: Strategies for the Urban High School*

<http://schooltechnologystrategies.sri.com/>

*The Digital Disconnect: The Widening Gap Between Internet Savy Students and Their Schools*

<http://www.pewinternet.org/reports/toc.asp?Report=67>

Available as Adobe PDF File.

*Promising Practices and Organizational Challenges in Community Technology Centers*

[http://www.sri.com/policy/ctl/assets/images/vStreets\\_Promising\\_Practices.pdf](http://www.sri.com/policy/ctl/assets/images/vStreets_Promising_Practices.pdf)

---

**Recommended Reading**

Armstrong, S. (Ed.). 2002. Edutopia: Success Stories for Learning in the Digital Age. SF, CA: Jossey-Bass.

Bowers, C.A. 2000. Let Them Eat Data. Athens, GA: Univ of Georgia Press.

Cuban, L. 1986. Teachers and Machines: The Classroom Use of Technology Since 1920. NY, NY: Teachers College Press.

DiSessa, A. 2000. Changing Minds: Computers, Learning and Literacy. Cambridge, MA: MIT Press.

Muffoletto, R. (Ed.). 2001. Education & Technology: Critical and Reflective Practices. Cresskill, NJ: Hampton Press.

Provenzo, E., Brett, A., McClosky, G. 1999. Computers, Curriculum, and Cultural Change. Mahwah, NJ: Lawrence Erlbaum

Warlick, D. 2002. Raw Materials for the Mind. Third Edition. Raleigh, North Carolina: The Landmark Project.

## Course Description

This course engages learners in the critical analysis of how technology contributes to learning, teaching and educational reform. Topics include the pedagogy of distance and distributed learning; using collaborative technologies for user-generated content; tapping into students' social and learning needs through videoconferencing; portfolio assessment, community based and project-based learning. Special emphasis is placed on how technology influences various communities of learners. EDST 631 will be in a seminar format using teleconferencing, collaborative teamwork, critical reflection, and analysis of practice.

## Learner Outcomes

1. Analyze and illustrate various ways in which technologies may contribute to learning, teaching and educational reform.
2. Relate classroom applications of technology to contemporary theories and practice in education.
3. Demonstrate skill in the use of technology including teleconferencing for teaching and learning.
4. Synthesize information related to the impact of technology on learning, teaching and various communities of learners to formulate a convincing and articulate position to inform your role as educator.

## Course Outline (Calendar of topics)

Week	Date	Topic	Assignment Due
1	Sept. 5	<b>Introduction</b> Relating contemporary theories and practice in education to classroom applications of technology	Please go to ACD 202, to activate your CSUSM email account, or provide another email address. Beginning Sept. 12, each class will include a Reading Response - with student led discussion on topic (no more than 2 people/class. Approximately 20-30 minutes) Please sign up for the topic of your choice.
2	Sept. 12	<b>How People Learn</b> Assignment for Oct. 10 iMovie preparation Collect 3-7 minutes of digital video max Story board with 5-10 file cards	Reading Response #1 (located online) <i>Changing How and What Children Learn in School with Computer-Based Technologies</i>  <a href="http://www.sri.com/policy/ctl/assets/images/RoschelleEtAIPackard2000.pdf">http://www.sri.com/policy/ctl/assets/images/RoschelleEtAIPackard2000.pdf</a>
3	Sept. 19	Getting Started with Videoconferencing VIDEOCONFERENCE 5:30-7:00 Richard Harrison	Reading Response #2 (located online) <i>Transforming Learning with Technology: Strategies for the Urban High School</i>  <a href="http://schooltechnologystrategies.sri.com/">http://schooltechnologystrategies.sri.com/</a>
4	Sept. 26	<b>Classroom applications for Videoconferencing</b> VIDEOCONFERENCE 5:30-7:00 Katie Beedon	Reading Response #3 Available as Adobe PDF File <i>The Digital Disconnect: The Widening Gap Between Internet Savy Students and Their Schools.</i>  <a href="http://www.pewinternet.org/reports/toc.asp?Report=67">http://www.pewinternet.org/reports/toc.asp?Report=67</a>
5	Oct. 3	<b>Collaborative Learning as an Instructional</b>	VC Draft Due

Week	Date	Topic	Assignment Due
		<b>Methodology</b> VIDEOCONFERENCE 5:30-7:00 Yvonne Andres <ul style="list-style-type: none"> <li>• Benefits of using collaborative learning as an instructional methodology</li> <li>• Incorporating videoconferencing as an effective collaborative learning tool</li> <li>• Finding partners and establishing group goals</li> </ul>	Reading Response #4 <i>Windows in the Future</i> Part 1. pp. 1-65
6	Oct. 10	<b>Using digital video for documenting and reflecting</b>	IMovie preparation 3-7 minutes of digital video max Story board with 5-10 file cards
7	Oct. 17	<b>Using PDA's to Increase Professional Productivity</b> Susan Brooks-Young	Reading Response # 5 Selected article on PDA's
8	Oct. 24	In lieu of class meeting you may either <ul style="list-style-type: none"> <li>• prepare for your videoconference</li> <li>• use lab time to become more familiar with imovie</li> <li>• prepare reflections on your progress for your portfolio</li> </ul>	
		Poster Sessions	<b>Poster</b> Reading Response Due Bertrand, Yves. 1995. <u>Contemporary Theories and Practice in Education</u> . Madison, WI: Atwood Publishing.
10	Nov. 7	VIDEOCONFERENCE 5:30-7:00 Student Led	Reading Response # 6 <i>Windows in the Future</i> Part Two pp. 65- end
11	Nov. 14	In lieu of class meeting you may either <ul style="list-style-type: none"> <li>• prepare for your videoconference</li> <li>• use lab time to work with imovie</li> <li>• prepare reflections on your progress for your portfolio</li> </ul>	
12	Nov. 21	Topic: Communication Strategies for VC Sherry Wulff, Alverno College Transactional Distance Robert Bulik, University of Texas VIDEOCONFERENCE 5:30-7:00	Reading Response # 7 <i>Promising Practices and Organizational Challenges in Community Technology Centers</i> <a href="http://www.sri.com/policy/ctl/assets/images/vStreets_Promising_Practices.pdf">http://www.sri.com/policy/ctl/assets/images/vStreets_Promising_Practices.pdf</a>
13	Dec. 5	VIDEOCONFERENCE 5:30-7:00  Student Led	
14	Dec. 12	VIDEOCONFERENCE 5:30-7:00  Student Led	
15	Dec. 19	Finals Week	

## Course Requirements and Assignments

There will be two primary requirements: the portfolio and reading response exercises, which include written demonstration of pedagogical content knowledge. The portfolio will be collaboratively assessed during the final classes. Reading responses will be assessed on a weekly basis.

The *portfolio* will consist of several entries, each of which asks for direct evidence of addressing course content and an analytical commentary on evidence for meeting course objectives and related course learnings. There are *three different 631classroom-based entries, one requires learners to videotape a videoconference interaction, one requires learners to plan, implement and evaluate a videoconference session, and one documents critical analysis through group leadership.* From these data, learners will write a *detailed analysis of their learning and teaching* reflected in the videotape and/or student work. These reflections should include documentation of the learner's work with colleagues and the larger educational technology community.

The *Reading Response exercises* are written demonstration of content knowledge including the ability to respond to specific prompts, within a specified time period. There are seven written responses and one more inclusive analysis in the form of a poster session The poster session is due Oct. 31 on relating contemporary theories and practice in education to classroom applications of technology.

- **Reading responses. (12%)**
- **Class participation, including videoconferencing and peer support. (15%)**
- **Completed portfolio entries including one videotape or iMovie. (50%)**
- **Critical Analysis/Group Leadership: practice of descriptive, analytic, and reflective thinking through discussion leadership (8%)**
- **Videoconference planning, research on content area, implementing and evaluating. (15%)**

### Assignments

#### Reading Responses

**Learner Outcome:** Analyze and illustrate various ways in which technologies may contribute to learning, teaching and educational reform.

**Activity:** Students will demonstrate mastery of the concepts and processes in this professional education class by a series of written responses and applications to the readings and class discussions. For the readings, students should present their responses to each assignment in one of the following forms:

- a. Big Ideas paper explaining the key concepts in either outline or narrative form
- b. visual or symbolic representation of the key concepts
- c. graphic organizer that demonstrates the key concepts and their relationships to one another (such as through the use of Inspiration or other graphic organizer)

The responses should be 1-2 pages. They must be typed or digitally created. They will be checked off for completion at each class; representative samples will be examined for closer reading.

**Assessment:** Key skills/knowledge:

At what level have you comprehended the content?

Is your work a summary of the content presented?

How have you connected your readings to other readings or life experiences?

Late assignments will be penalized by point reductions each day they are late.

### **Assignment : Poster Session Oct.31**

**Learner Outcome:** Relate classroom applications of technology to contemporary theories and practice in education.

**Activity:** Read Contemporary Theories and Practice in Education.

Prepare a POSTER SESSION that demonstrates your ability to relate contemporary theories and practice in education to classroom applications of technology. Student poster may be digital or hard copy display. It must include a cogent argument supporting the benefits of a specific educational use of technology and the related educational theory which supports the practice. Quotes, proper citations and references must be included. Photographs, diagrams and visual mapping are encouraged.

**Assessment:** Key skills/knowledge:

At what level have you comprehended the content?

Does your work directly connect theory with practice?

How have you connected your readings to other readings or life experiences?

How might this presentation contribute substantial information at conference or professional gatherings?

### **Assignment: Critical Analysis/Group Leadership**

**Learner Outcome:** Synthesize information related to the impact of technology on learning, teaching and various communities of learners to formulate a convincing and articulate position to inform your role as educator.

**Activity:** Lead and facilitate a discussion on concepts related to the impact of technology

Select a topic from the list of readings

Provide summary of reading in some visual, audio or tactile format

Raise provocative questions that will cause members to do more thinking

Assist the group in seeing connections to other readings and experiences

Use citations to support major points of discussion

Help participants see the how the discussion is related to the purposes of the group

Assure everyone has a chance to express his/her opinions

Summarize and bring discussion to closure

**Assessment:** Key skills/knowledge:

Use of higher-order cognitive skills: application, analysis, synthesis, evaluation (Bloom et al.1956 :Gronlund 1978).

Did you actively engage others in the discussion?

To what extent did you include special needs students, various communities of learners or

**Assignment: Videoconference including plan, research content area, design, implement and evaluate.**

**Learner Outcome:** Demonstrate skill in the use of technology including teleconferencing for teaching and learning.

**Activity**

- Prepare and submit VC plan in draft form for feedback (due Oct. 3)
- comprehensive typed instructional design/plan for Videoconference \*due 2 weeks before VC
- implementation
- documentation and reflection through video or imovie
- evaluation/assessment
- reflection,

**Assessment:** Key skills/knowledge:

- To what extent did you actively engage distant as well as local participants?
- Were learner outcomes identified, addressed and met?
- To what extent did the video document and contribute to the reflective process?

---

**Criteria for Grading Assignments**

A	Outstanding work on assignment, excellent syntheses of information and experiences, great insight and application, and excellent writing.	90-100%
B	Completion of assignment in good form with good syntheses and application of information and experiences; writing is good.	80-89%
C	Completion of assignment, adequate effort, adequate synthesis of information and application of information and experiences, writing is adequate.	70-79%
D	Incomplete assignment, inadequate effort and synthesis of information, writing is less than adequate.	60-69%

**Grading Policy**

**An "A" student is one who:**

- completes all assignments on time and demonstrates the ability to summarize, analyze, and/or reflect at high levels.
- varies sources of information for assignments, demonstrating high degree of effort in pursuing varied perspectives around important educational issues.
- completes all the reading assignments and develops thoughtful and thorough responses.
- produces work that reveals a strong commitment to self-discovery and learning.
- produces work at a high professional level in terms of both writing and content.
- develops a high quality presentation, demonstrating significant learning around a contemporary issue.
- presents confidently and intelligently, demonstrating effective teaching skills.
- completes assignments in/out of class with a focus on learning and exploration, pushing him/herself to better understand the profession through quality work.
- attends almost every class meeting and is fully engaged during class.
- pushes him/herself to new understandings by participating in discussions, sharing his/her opinions, and valuing others' perspectives.
- contributes to the positive environment of the class by respecting all members.

***A “B” student is one who:***

- completes all or almost all assignments, all or most on time, and demonstrates the ability to summarize, analyze, and/or reflect at fairly high levels, showing consistent improvement over time.
- varies sources of information for assignments, demonstrating high degree of effort in pursuing varied perspectives around important educational issues.
- completes all or most of the reading assignments and develops thoughtful and fairly thorough responses.
- produces work that reveals a commitment to self-discovery and learning.
- produces work that is close to professional level in terms of both content and writing, working to develop a strong command of writing, speaking, planning and presenting.
- develops presentations, demonstrating significant learning
- presents confidently and intelligently, demonstrating effective teaching skills.
- completes assignments in/out of class with a focus on learning and exploration, pushing him/herself to better understand the profession through quality work.
- attends almost every class meeting and is regularly engaged during class.
- pushes him/herself to new understandings by participating in discussions, sharing his/her opinions, and valuing others’ perspectives.
- contributes to the positive environment of the class by respecting all members.

***A “C” student is one who:***

- completes or attempts most of the assignments, mostly on time, and demonstrates the ability to do some quality summarizing, analysis, and reflection, showing improvement over time.
- varies sources of information for assignments, demonstrating effort in pursuing varied perspectives around important educational issues.
- completes most of the reading assignments and develops thoughtful and sometimes thorough responses.
- produces work that reveals a commitment to some self-discovery and learning.
- produces work that is not yet at a professional level in terms of both writing and content.
- develops a quality presentation, demonstrating learning around a contemporary issue.
- presents confidently and intelligently, demonstrating some effective teaching skills.
- completes assignments in/out of class with a focus on learning and exploration, pushing him/herself a little to better understand the profession.
- attends most class meetings and is often engaged during class.
- pushes him/herself to some new understandings by participating to a moderate degree in discussions, sharing his/her opinions, and valuing others’ perspectives.
- contributes to the positive environment of the class by respecting all members.

A “D” student is one who doesn’t meet all of the minimal standards of a “C” student; “F” is earned by someone who hasn’t completed significant portions of the required work and fails to meet the “C” student standards.

**Writing:** In keeping with the All-University Writing Requirement, all courses must have a writing component of at least 2,500 words (approximately 10 pages) which can be administered in a variety of ways.

**Attendance Policy:** Due to the dynamic and interactive nature of course in the COE, all students are expected to attend all classes and participate actively. At a minimum, students must attend more than 80% of class time, or s/he may not receive a passing grade for the course at the discretion of the

instructor. If two class sessions are missed, or if the student is late (or leaves early) more than three sessions, s/he cannot receive a grade of “A”. If three class sessions are missed, the highest possible grade that can be earned is a “C+”. If extenuating circumstances occur, the student should contact the instructor as soon as possible to make appropriate arrangements.

Mission of the College of Education at CSUSM. The mission of the College of Education Community is to collaboratively transform public education by preparing thoughtful educators and advancing professional practices. We are committed to diversity, educational equity, and social justice, exemplified through reflective teaching, life-long learning, innovative research, and on-going service. Our practices demonstrate a commitment to student-centered education, diversity, collaboration, professionalism and shared governance. (Adopted by COE Governance Community, October 1997)

Authorization to Teach English Learners. This credential program has been specifically designed to prepare teachers for the diversity of languages often encountered in California public school classrooms. The authorization to teach English learners is met through the infusion of content and experiences within the credential program, as well as additional coursework. Students successfully completing this program receive a credential with authorization to teach English learners. (Approved by CCTC in SB 2042 Program Standards, August 02))

Students with Disabilities Requiring Reasonable Accommodations. Students are approved for services through the Disabled Student Services Office (DSS). This office is located in Craven Hall 5205, and can be contacted by phone at (760) 750-4905, or TTY (760) 750-4909. Students authorized by DSS to receive reasonable accommodations should meet with their instructor during office hours or, in order to ensure confidentiality, in a more private setting.



## FAQ Sheet

### 1. What if students want to work on the weekends?

Students should plan to work in SCI 207 outside of class. UNIV 360 is pretty busy during the week -- and is not open on Saturday or Sunday. SCI 207 will be open on Saturday's. If there is demand we can open SCI 207 on Sunday as well.

UNIV 271 is open on Saturday and during the week also -- there are 7 Macs in UNIV 271 . We have four Macintoshes in ACD 202 also.

### 2. How does this course relate to the **National Board for Professional Teaching Standards (NBPTS)**?

All courses within the CSUSM masters program are intended to provide a comprehensive professional development experience. Teachers pursuing National Board Certification will find the COE assessment process, including requirements for portfolio completion, particularly helpful. Regardless of whether or not National Board Certification is sought and achieved, by the time teachers complete the program they will have made and documented significant accomplishments, which will be reflected in their practice.

The National Board for Professional Teaching Standards' (NBPTS) five core propositions are reflected in the COE masters program course syllabi. The concepts in the five propositions are the heart of the National Board's perspective on what teachers should know and be able to do. They help frame the core experiences and activities that enable teachers to demonstrate a high level of knowledge, skills, dispositions, and commitments described by these propositions. They provide the foundation for all standards and assessment. These propositions are: 1) Teachers are committed to students and their learning; 2) Teachers know the subjects they teach and how to teach those subjects to students; 3) Teachers are responsible for managing and monitoring student learning; 4) Teachers think systematically about their practice and learn from experience; and 5) Teachers are members of learning communities.

Students will be supported in meeting the National Board's high and rigorous standards through the completion of their school-site portfolio that provides evidence of teaching practice through student work, videotapes of classroom interaction, and written commentaries that document and reflect their actions. These sources of evidence serve as a lens to what teachers do and how they think about their practice.

The EDST 631 course activities focus on content knowledge as well as age-appropriate and content-appropriate strategies that teachers may use for teaching subject matter with technology tools. Students will demonstrate their knowledge by responding to topics and readings which address critical issues of change. Course objectives that align with (NBPTS) indicate that all students will show evidence of the following:

- A commitment to students and their learning.
- Knowledge of the subjects they teach and how to teach them.
- The demonstration of management and monitoring of student learning.
- Thinking systematically about their practice and learning from experience.
- Involvement as members of learning communities.

**Authorization to work with English Learners Competencies**

<b>PART 1: LANGUAGE STRUCTURE AND FIRST- AND SECOND-LANGUAGE DEVELOPMENT</b>	<b>PART 2: METHODOLOGY OF BILINGUAL, ENGLISH LANGUAGE DEVELOPMENT, AND CONTENT INSTRUCTION</b>	<b>PART 3: CULTURE AND CULTURAL DIVERSITY</b>
I. Language Structure and Use: Universals and Differences (including the structure of English)	2. Theories and Methods of Bilingual Education	I. <u>The Nature</u> 3. <u>Culture</u>
A. The sound systems of language (phonology)	A. Foundations	A. <u>Definitions of culture</u>
B. Word formation (morphology)	B. Organizational models: What works for whom?	B. <u>Perceptions of culture</u>
C. Syntax	C. Instructional strategies	C. Intragroup differences (e.g., ethnicity, race, generations, and micro-cultures)
D. Word meaning (semantics)	II. Theories and Methods for Instruction In and Through English	D. Physical geography and its effects on culture
E. Language in context	A. Teacher delivery for both English language development and content instruction	E. Cultural congruence
F. Written discourse	B. Approaches with a focus on English language development	II. Manifestations of Culture: Learning About Students
G. Oral discourse	C. Approaches with a focus on content area instruction (specially designed academic instruction delivered in English)	A. What teachers should learn about their students
H. <u>Nonverbal communication</u>	D. Working with paraprofessionals	B. How teachers can learn about their students
II. Theories and Factors in First- and Second-Language Development	III. Language and Content Area Assessment	C. How teachers can use what they learn about their students (culturally responsive pedagogy)
A. Historical and current theories and models of language analysis that have implications for second-language development and pedagogy	A. Purpose	III. <u>Cultural Context</u>
B. Psychological factors affecting first- and second-language development	B. Methods	A. Concepts of cultural contact
C. Socio-cultural factors affecting first- and second-language development	C. State mandates	B. Stages of individual cultural contact
D. Pedagogical factors affecting first- and second-language development	E. Limitations of assessment	C. The dynamics of prejudice
E. Political factors affecting first- and second-language development	E. Technical concepts	D. Strategies for conflict resolution

**EDST631 The Impact of Technology on Teaching & Learning** stresses competencies highlighted with shading

**(TO BE LINKED)**  
**EDST 631**

## **Guest Resources**

### **Getting Started With Videoconferencing**

Presenter: Richard Harrison

September 19, 2002 5:30-7:00 pm

Richard Harrison is Production/Program Manager of the Instruction Television Unit for the San Diego County Office of Education's Joe Rindone Regional Technology Center. Mr. Harrison is SDCOE's chief producer/director for live television, video taped resources, and online video production. His background in theater and television spans 30 years. Richard is a multiple Emmy award winner whose skills include writing, producing, directing, and designing. His high expectations and focus on quality educational programming have been recognized by many organizations, among them: the California School Boards Association (Golden Bell award for MathVision), the International Reading Association (Books Across America), and the National School Public Relations Association (Reading Recovery, Working Toward Excellence, and The Parent Hour). Richard is able to coordinate complex projects to achieve high quality results in a cost-effective manner. Richard prides himself in his staff's ability to get impossible projects done on time and on budget.

### **Using PDA's for Professional Productivity**

S.J. Brooks-Young Consulting

email: [SJBrooks@aol.com](mailto:SJBrooks@aol.com)

telephone: 909-984-2940

summer telephone: 360-468-2979

Web site: [http://sjbrooks\\_young.tripod.com/](http://sjbrooks_young.tripod.com/)

### **Classroom applications for VC including Virtual Fieldtrips**

Katie Beedon

PacBell

**Yvonne Marie Andrés**

**Global SchoolNet Foundation**

**San Diego, California**

**[yvonne@globalschoolnet.org](mailto:yvonne@globalschoolnet.org)**

**Phone: (760)635-0001 Fax: (760)635-0003**



---

**Yvonne Marie Andrés**

760-635-0001

Yvonne@globalschoolnet.org

<http://www.globalschoolnet.org/about/founders.html>

**Global SchoolNet Foundation (GSN)**

*Collaborate, communicate & celebrate learning!*

Yvonne Marie Andres is the President and CEO of the Global SchoolNet Foundation, founder of the Global Schoolhouse. and former Vice President of Internet Learning Programs and Partnerships at Lightspan.com.

An educator for nearly two decades, Ms. Andres has taught pre-school through university and is dedicated to discovering, demonstrating, and documenting the power of "Internet-based learning." Ms. Andres has also designed and taught many courses, including "Hello Internet," "Managing Global Learning Projects," "Designing On-line Courses," and "Creating Effective Educational Websites." Ms. Andres' activities include producing and facilitating exciting and innovative Internet learning projects, including International CyberFair.

Ms. Andres has been champion of instructional telecommunications since 1984, as a project director for various networks including the AT&T Learning Network, CORE (California Online Resources in Education) Network, CERFnet (California Education and Research Federation) and the Free Educational Mail (FrEdMail) Network. She has provided leadership and training in educational telecommunications at conferences and workshops throughout the U.S., Canada, Asia, Europe, Australia, South America and Africa. She also designed a pilot interactive Internet video project with ABC World News Now.

In 1988 she co-authored "TeleSensations: The Educators' Handbook to Instructional TeleComputing" and for seven years served as the editor of an international newsletter focusing on collaborative telecomputing projects. She has helped develop hundreds of successful online projects, two of which were selected as model telelessons by the California Educational Technology Committee. Ms. Andres has written numerous articles, is the winner of the 1989 Computer Learning Month's Telecommunications Lesson Plan contest and is featured on the cover of the May 1990 Teaching and Computers with some students in "Telecommunicating from Sea to Shining Sea."

In 1992 Ms. Andres developed and coordinated the original Global Schoolhouse Project, electronically bringing together students from schools in Tennessee, Virginia, California, and England. Students, grades 5 through 8, conducted an environmental study of watershed pollution and shared their findings via state-of-the-art video conferencing using desktop computers and the Internet. The project was

expanded to include schools in twelve states who collaboratively used the Internet to study alternative energy sources, space exploration, natural disasters, and waste management.

Ms. Andres authored, "CERF'n Safari: An Educators' Guide to the Internet," the very first teacher's Internet guide! In 1994 Ms. Andres accepted an appointment to the Governor's Information Technology Council for the State of California, where she helped author "Getting Results." Ms. Andres is also a co-author of "Going to School on the Internet" (a publication of Cisco Systems) and "Harnessing the Power of the Web for Classroom Use: A Tutorial." In 1997 Ms. Andres authored Apple's "Getting Started on the Internet." Ms. Andres was selected as a Woman of Merit and in 1997 she was chosen as one of the 100 most influential people in U.S. public education. In 1999 Ms. Andres was named one of the 30 most influential people in technology education by eSchool News and most recently she was selected as one of the top 25 technology advocates by Curriculum Administrator magazine.

Ms. Andres is a doctoral candidate at United States International University (San Diego, CA), researching the benefits and challenges of online collaborative learning.

[www.globalschoolnet.org](http://www.globalschoolnet.org)

**(TO BE LINKED)**  
**READINGS AND SUPPORT MATERIAL**

[www.globalschoolnet.org](http://www.globalschoolnet.org)

Global SchoolNet (GSN), a developer of online content since 1984, partners with schools, communities, organizations and businesses to provide collaborative learning activities that prepare students for the workforce and help them to become responsible and literate global citizens.

GSN's mission is to identify, support, and encourage effective practices and programs that engage students in meaningful content and personal exchanges with people around the world to develop basic and advanced literacy and communication skills, create multi-cultural understanding, and prepare them for full participation as productive and effective citizens in an increasing global economy. GSN has been designing collaborative learning projects incorporating videoconferencing since 1992. Our teachers use live interactive videoconferencing as an instructional tool. Our K12 students have interacted with famous politicians, CEOs, scientists, authors, and other leaders around the world.

Collaborative learning, sometimes called group learning, shared learning, or partner learning, takes advantage of learning as a social process. Research indicates that students are frequently more motivated to work, when there is an audience beyond that of the teacher. Additional benefits of collaborative learning are many. Students can access interesting source data, experience virtual travel, and connect with other students and subject experts to study and learn together. Students can practice learning new languages, by connecting non-native speakers with native speakers. Learning is more meaningful when, for example, students who are studying volcanoes can communicate directly with children living at the foot of Mount Kilauea in Hawaii and learn first hand about flowing lava, spewing ashes, and seismic activity. Geography, history, politics and world cultures become more relevant to students as they communicate directly with other students from distant locations.

Yvonne Marie Andrés  
Global SchoolNet Foundation  
San Diego, California

## EDST 631 Required and Recommended Reading

Fall 2002

### ONLINE

#### **Changing How and What Children Learn in School with Computer-Based Technologies**

Jeremy M. Roschell, Roy D. Pea, Christopher M. Hoadley, Douglas N. Gordin, Barbara M. Means

<http://www.sri.com/policy/ctl/assets/images/RoschelleEtAlPackard2000.pdf>

#### Abstract

Schools today face ever-increasing demands in their attempts to ensure that students are well equipped to enter the workforce and navigate a complex world. Research indicates that computer technology can help support learning, and that it is especially useful in developing the higher order skills of critical thinking, analysis, and scientific inquiry. But the mere presence of computers in the classroom does not ensure their effective use. Some computer applications have been shown to be more successful than others, and many factors influence how well even the most promising applications are implemented.

This article explores the various ways computer technology can be used to improve how and what children learn in the classroom. Several examples of computer-based applications are highlighted to illustrate ways technology can enhance how children learn by supporting four fundamental characteristics of learning: (1) active engagement, (2) participation in groups, (3) frequent interaction and feedback, and (4) connections to real-world contexts. Additional examples illustrate ways technology can expand what children learn by helping them to understand core concepts in subjects like math, science, and literacy. Research indicates, however, that the use of technology as an effective learning tool is more likely to take place when embedded in a broader education reform movement that includes improvements in teacher training, curriculum, student assessment, and a schools capacity for change. To help inform decisions about the future role of computers in the classroom, the authors conclude that further research is needed to identify the uses that most effectively support learning and the conditions required for successful implementation.

#### **Transforming Learning with Technology: Strategies for the Urban High School**

<http://schooltechnologystrategies.sri.com/>

**Roy Pea.** Books Bransford, JD, Brown, A., & Cocking, R. (2000). (Eds.), **How People Learn: Mind, Brain, Experience and ...**

[scil.stanford.edu/HTML%20Folder/publications.html](http://scil.stanford.edu/HTML%20Folder/publications.html) - 40k

Larry Cuban Links

#### **Computers, Oversold and Underused**

<http://www.hup.harvard.edu/pdf/CUBOVE.pdf>

This is the on-line version of the book.

**Tech Learning Magazine Interview**

[http://www.techlearning.com/db\\_area/archives/TL/062000/archives/cuban.html](http://www.techlearning.com/db_area/archives/TL/062000/archives/cuban.html)

A great interview that clarifies Mr. Cuban's position on educational technology.

**Techno-Reformers and Classroom Teachers**

<http://www.edweek.org/ew/vol-16/06cuban.h16>

"This persistent dream of technology driving school and classroom changes has continually foundered in transforming teaching practices. Although teachers have slowly added a few technologies to their repertoires, techno-reformers have seldom been pleased with either the pace of classroom change or the ways that teachers have used new machines."



### Larry Cuban Books\*

Oversold and Underused: Computers in the Classroom, Larry Cuban, September 2001, Harvard Univ Pr; ISBN: 067400602X

Netsavvy : Building Information Literacy in the Classroom, Ian Jukes, Anita Dosaj, Bruce Macdonald, June 2000, Altamira Pr; ISBN: 0761975659

Reconstructing the Common Good in Education, Larry Cuban, Dorothy Shipps July 2000, Stanford Univ Pr; ISBN: 0804738637

Among School Teachers : Community, Autonomy, and Ideology in Teachers' Work, Joel Westheimer, Larry Cuban, May 1998, Teachers College Pr; ISBN: 0807737445

How Scholars Trumped Teachers : Constancy and Change in University Curriculum, Teaching, and Research, 1890-1990 by Larry Cuban, February 1999, Teachers College Pr; ISBN: 0807738646

Teacher Time by Marty Shollenberger Swaim, Stephen C. Swaim, Larry Cuban , August 1999, Unknown; ISBN: 0967303109

Technology, Curriculum and Professional Development : Adapting Schools to Meet the Needs of Students With Disabilities by John Woodwark, Larry Cuban (November 2000) Corwin Pr; ISBN: 0761977422

Tinkering Toward Utopia : A Century of Public School Reform by Larry Cuban (Contributor), David B. Tyack Reprint edition ,March 1997, Harvard Univ Pr; ISBN: 0674892836

Managerial Imperative and the Practice of Leadership in Schools (Suny Series in Educational Leadership) by Larry Cuban January 1988 State Univ of New York Pr; ISBN: 0887065937

Teachers and Machines : The Classroom Use of Technology Since 1920 by Larry Cuban , January 1986, Teachers College Pr; ISBN: 080772792X

## Publications - Roy Pea

### Books

Bransford, J. D., Brown, A., & Cocking, R. (2000). (Eds.), *How People Learn: Mind, Brain, Experience and School*, Expanded Edition (incorporating both books below). Washington, DC: National Academy Press. (Co-author).

Donovan, M. S., Bransford, J. D., & Pellegrino, J. (1999, June). (Eds.). *How People Learn: Bridging Research and Practice*. Washington, DC: National Academy Press. (Co-author).

Bransford, J. D., Brown, A., & Cocking, R. (1999, March). (Eds.), *How People Learn: Mind, Brain, Experience and School*. Washington, DC: National Academy Press. (Co-author).

Pea, R. D., & Sheingold, K. S. (1987). (Eds.). *Mirrors of minds: Patterns of experience in educational computing*. Norwood, NJ: Ablex. (In *Computers and Cognition* series, edited by John Black.) Co-authored four chapters. Translated and published in Russia and in China.

### **Articles and Chapters**

Roschelle, J. & Pea, R. D. (2002, January 7-11). A walk on the WILD side: How wireless handhelds may change computer-supported collaborative learning (CSCL). To appear in the *International Journal of Cognitive Technologies*.

Brecht, J., Chung, M., & Pea, R. (2002, January 7-11). CML – The ClassSync Modeling Language. *Proceedings of the International Conference on Computer Supported Collaborative Learning*. Boulder, Colorado.

Pea, R. D. (2001). Technology, equity, and K-12 learning. In R. Noll (Ed). *Bridging the digital divide: California Public Affairs Forum* (pp. 39-51). Sacramento, CA: California Council of Science and Technology.

[President's Information Technology Advisory Committee \(PITAC\)](#) (2001, February). Using information technology to change the way we learn. Graham, S. L. & Viterbi, A.J. (Chairs). Panel on Transforming the Way We Learn. (46 pp.) (Invited participant, and co-author)

Hoadley, C. M. & Pea, R. D. (in press). Finding the ties that bind: Tools in support of a knowledge-building community. In K. A. Renninger & W. Shumar (Eds.), *Building virtual communities*. New York: Cambridge University Press.

Polman, J.L., & Pea, R. D. (in press). Transformative communication as a cultural tool for guiding inquiry science. *Science Education*.

Polman, J. , & Pea, R.D. (in press). Transformative communication in project science learning discourse. In R. Horowitz (Ed.), *The evolution of talk about text: Knowing the world through classroom discourse*. International Reading Association and Teachers College Press.

Roschelle, J., Pea, R., Hoadley, C., Gordin, D., & Means, B. (2001). *Changing how and what children learn in school with collaborative*

cognitive technologies. In M. Shields (Ed.), [The Future of Children \(Special issue on Children and Computer Technology\)](#), published by the David and Lucille Packard Foundation, Los Altos, CA), Volume 10, Issue 2, pp. 76-101.

Pea, R. D. (2000). Introduction. *The Jossey Bass Technology in Learning Reader* (pp. xv-xxiv). San Francisco, CA: Jossey-Bass.

Edelson, D. C., Gordin, D.N., & Pea, R. D. (1999). Addressing the challenges of inquiry-based learning through technology and curriculum design. *Journal of the Learning Sciences*, 8(3&4), 391-450.

Pea, R.D., Tinker, R., Linn, M., Means, B., Bransford, J., Roschelle, J., Hsi, S., Brophy, S., & Songer, N. (1999). Toward a learning technologies knowledge network. *Educational Technology Research and Development*, 47, 19-38.

Pea, R. D. (1999). New media communication forums for improving education research and practice. In E. C. Lagemann & L. S. Shulman (Eds.), *Issues in Education Research: Problems and possibilities* (pp. 336-370). San Francisco, CA: Jossey Bass.

Roschelle, J., DiGiano, C., Pea, R., & Kaput, J. (1999). Educational Software Components of Tomorrow (ESCOT). *Proceedings of M/SET 99. International Conference on Mathematics/ Science Education & Technology*, March 1-4, 1999, San Antonio, Texas.

Roschelle, J., & Pea, R. D. (1999). Trajectories from today's WWW to a powerful educational infrastructure. *Educational Researcher*, 28(5), 22-25.

Hand, V., Roschelle, J., & Pea, R. D. (1999). Dimensions of Quality Management Systems in Self-improving Communities. *ACM DL*, 227.

Pea, R. D. (1998). Distributed intelligence and the growth of virtual learning communities over the global Internet. PC97 Keynote Address, Kyoto, Japan, Council for Improving Educational Computing. (Translation in Japanese).

Gomez, L. M., Fishman., B.J., & Pea, R.D. (1998). The CoVis Project: Building a large scale science education testbed. *Interactive Learning Environments*, 6(1-2), 59-92.

Pea, R.D., Gomez, L. M., Edelson, D.C., Fishman, B. J., Gordin, D. N., & O'Neill, D. K. (1997). Science education as a driver of cyberspace technology development. In K. C. Cohen (Ed.), *Internet links for science education* (pp. 189-220). New York, NY: Plenum Press.

Pea, R. D. (1997). Learning and teaching with educational technologies. In H.J. Walberg & G. D. Haertel (Eds.), *Educational psychology: Effective practices and policies* (pp. 274-296). Berkeley, CA: McCutchan Publishers.

Gordin, D., Gomez, L., Pea, R. D., & Fishman, B. (1996, December). Using the World Wide Web to build learning communities in K-12. *Journal of Computer-Mediated Communications*, 2(3).  
(<http://www.usc.edu/dept/annenberg/vol2/issue3/gordin.html>)

Edelson, D. C., Pea, R. D., & Gomez, L. M. (1996). [The Collaboratory Notebook. Communications of the Association for Computing Machinery](#), 39(4), 32-33.

Gordin, D. N., Edelson, D. C., Gomez, L. M., Lento, E. M., & Pea, R.D. (1996, January). [Student conference on Global Warming: A collaborative network-supported ecologically hierarchic geosciences curriculum](#). Proceedings of the 76th American Meteorological Society Meetings.

Ramamurthy, M., Wilhelmson, R., Hall, S., Plutchak, J., Sridhar, M., Fishman, B., Gordin, D., Pea, R. D., & Gomez, L. M. (1996, January). CoVis Geosciences Web Server: An Internet-Based Resource for the K-12 community. Proceedings of the 76th American Meteorological Society Meetings.

Edelson, D. C., Pea, R. D., & Gomez, L. (1995). Constructivism in the collaboratory. In B. G. Wilson (Ed.), *Constructivist learning environments: Case studies in instructional design* (pp. 151-164). Englewood Cliffs, NJ: Educational Technology Publications.

Fishman, B., Gomez, L., Pea, R., & Gordin, D. (1995). Using the WWW to Build Learning Communities in K-12 Settings, Part II: The Next Generation of Web Servers to Support Learning Communities. *Global Network Navigator*, O'Reilly and Associates, Inc.

Fishman, B. J., Gordin, D. N., Gomez, L.M., & Pea, R. D. (1995). Using the WWW to Build Learning Communities in K-12 Settings, Part I. *Global Network Navigator*, O'Reilly and Associates, Inc.

Gordin, D., Edelson, D., & Pea, R. D. (1995, January). [The Greenhouse effect visualizer: A tool for the science classroom. Proceedings of the 75th American Meteorological Society Meetings.](#)

Gordin, D., & Pea, R. D. (1995). Prospects for scientific visualization as an educational technology. *Journal of the Learning Sciences*, 4(3), 249-279.

Pea, R. D. (1995). The emergence and challenges of distributed multimedia learning environments. In F. Harmgarth (Ed.), *School improvement through media in education* (pp. 47-92). Gutersloh, Germany: Bertelsmann Foundation.

Ramamurthy, M. K., Wilhelmson, R.B., Pea, R.D., Gomez, L. M., & Edelson, D. C. (1995, January). [CoVis: A national science education collaboratory. Proceedings of the 75th American Meteorological Society Meetings.](#)

Reiner, M., Pea, R. D., & Shulman, D. (1995). The impact of simulator-based instruction on the diagramming of the interaction of light and matter by introductory physics students. *Journal of Science Education and Technology*, 4 (3), 199-226.

Fishman, B., & Pea, R.D. (1994). The Internetworked School: A Policy for the Future. *Technos: Quarterly of Education and Technology*, 3(1), 22-26.

Linn, M. C., diSessa, A., Pea, R. D., & Songer, N. B. (1994, March). Can research on science learning and instruction inform standards for science education? *Journal of Science Education and Technology*.

Gordin, D., Polman, J., & Pea, R. D. (1994). The Climate Visualizer: Sense-making through scientific visualization. *Journal of Science Education and Technology*, 3, 203-226.

McGee, S., & Pea, R. D. (1994, January). Cyclone in the classroom: Bringing the atmospheric sciences community into the high school. *Proceedings of the Third American Meteorological Society Symposium on Education, 74th Annual Meeting of the AMS, Nashville TN.*

Pea, R. D. (1994). Seeing what we build together: Distributed multimedia learning environments for transformative communications. *Journal of the Learning Sciences*, 3(3), 283-298.

Linn, M.C., & Pea, R. D. (1994). Discussion of Judah Schwartz's chapter. In A. H. Schoenfeld (Ed.), *Mathematical thinking and problem solving*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Koschmann, T., Newman, D., Woodruff, E., Pea, R.D., & Rowley, P. (1993). Technology and pedagogy for collaborative problem solving as a context for learning: Report on a CSCW '92 Workshop. *ACM SIGCHI Bulletin*, 25(4), 57-60.

Pea, R. D. (1993a, October). Current developments in Educational Technology Programs: Doctoral training in the Learning Sciences at Northwestern University. In D. P. Ely & B. M. Minor (Eds.), *Educational Media and Technology Handbook*. Englewood, CO: Libraries Unlimited.

Pea, R.D. (1993b). Distributed multimedia learning environments: The Collaborative Visualization Project. *Communications of the ACM*, 36(5), 60-63.

Pea, R. D. (1993c). Learning scientific concepts through material and social activities: Conversational analysis meets conceptual change. *Educational Psychologist*, 28(3), 265-277.

Pea, R. D. (1993d). Practices of distributed intelligence and designs for education. In G. Salomon (Ed.). *Distributed cognitions*. New York: Cambridge University Press, pp. 47-87. (Abridged version translated in Sayeki, Y. et al. (Eds.) *Information and Media (Modern Education Series, vol. 8)*, Tokyo; Iwanami-Shoten (to be published in 1998) (Published in Japanese. Japanese title; Joho to Media). (Koza: Gendai no Kyoiku, 8).

Pea, R. D., & Bransford, J. (1993, April). [Cognitive science, information technologies, and the reform of learning environments: High leverage opportunities for the MacArthur Foundation. MacArthur Foundation Report.](#)

Allen, C. L., Linde, C., Pea, R. D., de Vet, J., & de Vogel, R. (1992). The Picasso Project on Multimedia Communications: Final Report. Technical Report, Institute for Research on Learning. Palo Alto, CA. (14 minute videotape available on request).

Allen, C., & Pea, R. D. (1992). The social construction of genre in multimedia learning environments. Final Report to Apple Classroom of Tomorrow Project.

Pea, R. D. (1992). Augmenting the discourse of learning with computer-based learning environments. In E. de Corte, M. Linn, & L. Verschaffel

(Eds.), *Computer-based learning environments and problem-solving* (NATO Series, subseries F: Computer and System Sciences). New York: Springer-Verlag GmbH (pp. 313-343).

Pea, R. D., Allen, S., Sipusic, M., Goldman, S., Reiner, M., and Jul, S. (August). *Designing classroom discourse resources for conceptual change in science*. Final Report to the National Science Foundation, #MDR-88-55582. (26 minute videotape available on request).

Pea, R. D., & Gomez, L. (1992a). *Distributed multimedia learning environments: Why and how?* *Interactive Learning Environments*, 2(2), 73-109.

Pea, R.D. & Gomez, L. (1992b, September). *Learning through collaborative visualization: Shared technology learning environments for science*. Proceedings of SPIE '92 (International Society of Photo-Optical Instrumentation Engineers): *Enabling Technologies for High-Bandwidth Applications*, Vol. 1785, pp. 253-264.

Pea, R.D. (1991, July). *Learning through multimedia*. *IEEE Computer Graphics and Applications*, 11(4), 58-66 (Translated in Italian and republished in *Golem Newsletter*, March, 1992, 4(3), 6-13.)

Pea, R.D., Sipusic, M., & Allen, S. (1991). *Seeing the light on optics: Classroom-based research and development for conceptual change*. In S. Strauss (Ed.), *Development and Learning Environments: Seventh Annual Workshop on Human Development*. Norwood, NJ: Ablex. (editor never submitted final manuscript to publisher; manuscript available on request.)

Pea, R. D. (1990). *Inspecting everyday mathematics: Reexamining culture-cognition relations*. *Educational Researcher*, 19(4), 28-31.

Pea, R.D., Boyle, E., and de Vogel, R. (1990). *Design spaces for multimedia composing tools*. In B. Bowen (Ed.), *Designing for Learning*. Cupertino, CA: Apple Computer Press.

Roschelle, J., Pea, R. D., & Trigg, R. (1990). *VideoNoter: A tool for exploratory video analysis*. Institute for Research on Learning, Technical Report, No. 17.

Thornburg, D.G., & Pea, R.D. (1990). *Synthesizing instructional technologies and educational culture: Exploring cognition and metacognition in the social studies*. *J. of Educational Computing Research*. 1989

Falmagne, R. J., Mawby, R. A., & Pea, R. D. (1989). Linguistic and logical factors in recognition of indeterminacy. *Cognitive Development*, 4, 141-176.

Mills, M. I., & Pea, R. D. (1989). Mind and media in dialog: Issues in multimedia composition. In K. Hooper & S. Ambron (Eds.), *Full-Spectrum Learning*. Cupertino, CA: Apple Computer, Inc.

Roschelle, J., Pea, R. D., & Sipusic, M. (1989, April). Design of a tool for video analysis. *Proceedings of ACM/SIGCHI Workshop on Video as a Research and Design Tool*, MIT, Cambridge MA.

Pea, R. D. (1988a). Computers and excellence in the future of education. *Annals of the New York Academy of Sciences*, 517, 125-138.

Pea, R. D. (1988b). Putting knowledge to use. In R. S. Nickerson & P. Zohdites (Eds.), *Technology in education in the year 2020*, pp. 169-212. Hillsdale, NJ: Erlbaum.

Pea, R.D., Eisenberg, M., & Turbak, F. (1988, August). Creatures of Habit: A computational system to enhance and illuminate the development of scientific thinking. *Proceedings of the Tenth Annual Meeting of the Cognitive Science Society*. Montreal, Canada. Hillsdale, NJ: Lawrence Erlbaum Associates.

Pea, R. D., & Soloway, E. (1988, June). The state of the art in educational technology R&D: Policy issues and opportunities. *Proceedings of the International Conference on Intelligent Tutoring Systems*, pp. 16-17, Montreal, Canada.

Hawkins, J., & Pea, R. D. (1987). Tools for bridging everyday and scientific thinking. *Journal for Research in Science Teaching*, 24(4), 291-307.

Kurland, D. M., Clement, C., Mawby, R., & Pea, R. D. (1987). Mapping the cognitive demands of learning to program. In D. Perkins, J. Lochhead, & J. Bishop (Eds.), *Thinking: Progress on research and teaching* (pp. 333-358). Hillsdale, NJ: Erlbaum.

McLaughlin, J. A., & Pea, R. D. (1987). The likelihood of correlational thinking in adults: A comparative study and methodological critique. *Journal of Genetic Psychology Monographs*.



Pea, R. D. (1987a). The aims of software criticism: Reply to Professor Papert. *Educational Researcher*, 16(5), 4-8.

Pea, R. D. (1987b). Cognitive technologies for mathematics education. In A. Schoenfeld (Ed.), *Cognitive science and mathematics education* (pp. 89-122). Hillsdale, NJ: Erlbaum.

Pea, R. D. (1987c). Making computer use humane (Review of *Using computers: The human factors of information systems* by Raymond S. Nickerson). *Contemporary Psychology*, 32, 420-421.

Pea, R. D. (1987d). Programming and problem-solving: Children's experiences with Logo. In T. O'Shea & E. Scanlon (Eds.), *Educational computing (An Open University Reader)*. London: John Wiley & Sons. (Also Technical Report No. 12, Bank Street College, Center for Children and Technology, April 1983).

Pea, R. D. (1987e). Review of *User-centered system design*, edited by D. A. Norman and S. Draper. *Journal of Educational Computing Research*, 3(1), 129-134.

Pea, R. D. (1987f). Socializing the knowledge transfer problem. *International Journal of Educational Research*, 11, 639-663.

Pea, R. D., & Hawkins, J. (1987). Planning in a chore-scheduling task. In S. L. Friedman, E. K. Scholnick, & R. R. Cocking (Eds.), *Blueprints for thinking: The role of planning in cognitive development* (pp. 273-302). Cambridge: Cambridge University Press.

Pea, R. D., & Kurland, D. M. (1987). Cognitive technologies for writing development. In L. Frase (Ed.), *Review of Research in Education*, Vol. 14 (pp. 71-120). Washington DC: AERA Press.

Pea, R. D., & Russell, R. L. (1987). Ethnography and the vicissitudes of talk in psychotherapy. In R. L. Russell (Ed.), *Spoken language in psychotherapy: Strategies of discovery*. New York: Plenum.

Pea, R. D., & Soloway, E. (1987, October). The state of the art in educational technology R&D: Policy issues and opportunities. Technical Report prepared for the Office of Technology Assessment, Washington, DC (NTIS Order #OB 88-194 634/AS; 145 pp.)

Pea, R. D., Soloway, E., & Spohrer, J. (1987). The buggy path to the development of programming expertise. *Focus on Learning Problems in Mathematics*, 9(1), 5-30.

Kurland, D. M., Pea, R. D., Clement, C., & Mawby, R. (1986). A study of the development of programming ability and thinking skills in high school students. *Journal of Educational Computing Research*, 2(4), 429-458. (Reprinted in E. Soloway & J. Spohrer (Eds.), *Studying the novice programmer*. Hillsdale, NJ: Erlbaum, 1989.)

Pea, R. D. (1986). Language-independent conceptual bugs in novice programming. *Journal of Educational Computing Research*, 2(1), 25-36.

Kurland, D. M., & Pea, R. D. (1985). Children's mental models of recursive Logo programs. *Journal of Educational Computing Research*, 1(2), 235-243. (Reprinted in E. Soloway & J. Spohrer (Eds.), *Studying the novice programmer*. Hillsdale, NJ: Erlbaum, 1989.)

Pea, R. D. (1985a). Beyond amplification: Using computers to reorganize human mental functioning. *Educational Psychologist*, 20, 167-182.

Pea, R. D. (1985b). Integrating human and computer intelligence. In E. L. Klein (Ed.), *New directions for child development: No. 28, Children and computers* (pp. 75-96). San Francisco: Jossey-Bass.

Pea, R. D. (1985c). Learning to think mathematically. *The Bank Street Software Letter*, 1(3), 1-2, 4.

Pea, R. D., Kurland, D. M., & Hawkins, J. (1985). Logo programming and the development of thinking skills. In M. Chen & W. Paisley (Eds.), *Children and microcomputers: Formative studies* (pp. 193-212). Beverly Hills, CA: Sage.

Hawkins, J., Pea, R. D., Glick, J., & Scribner, S. (1984). "Merds that laugh don't like mushrooms": Evidence for deductive reasoning by preschoolers. *Developmental Psychology*, 20(4), 584-594.

Mawby, R., Clement, C., Pea, R. D., & Hawkins, J. (1984, February). Structured interviews on children's conceptions of computers. Technical Report No. 19, Bank Street College, Center for Children and Technology. (Also ERIC-ED-249-932).

Pea, R. D. (1984). Symbol systems and thinking skills: Logo in context. Proceedings of the 1984 National Logo Conference (Also in Technical Report No. 29, Bank Street College, Center for Children and Technology.)

Pea, R. D., & Kurland, D. M. (1984). On the cognitive effects of learning computer programming. *New Ideas in Psychology*, 2, 137-168.

Pea, R. D., & Kurland, D. M. (1983, June). On the cognitive prerequisites of learning computer programming. Report to NIE (Contract #400-83-0016). Technical Report No. 18, Bank Street College, Center for Children and Technology. (Also ERIC-ED-249-931).

1982

Jewson (Hawkins), J., & Pea, R. D. (1982, August). Logo research at Bank Street College. *Byte*, 332-333.

McLaughlin, J. A., & Pea, R. D. (1982). Children's comprehension of relational terms: Two developmental levels. In C. E. Johnson & C. L. Thew (Eds.), *Proceedings of the Second International Congress on Child Language* (Vol. 1, pp. 284-293). Lanham, MD: University Press.

Pea, R. D. (1982a). Origins of verbal logic: Spontaneous denials by two- and three-year olds. *Journal of Child Language*, 9, 597-626.

Pea, R. D. (1982b, November). Prospects and challenges for using microcomputers in schools. Technical Report No. 7. New York: Bank Street College, Center for Children and Technology.

Pea, R. D. (1982c). Werner's influences on contemporary psychology. *Human Development*, 25, 303-308.

Pea, R. D. (1982d). What is planning development the development of? In D. Forbes & M. T. Greenberg (Eds.), *New directions for child development: No. 18, Children's planning strategies* (pp. 5-27). San Francisco: Jossey-Bass.

Pea, R. D. (1982e). Why not communicate about communication? *Contemporary Psychology*, 27, 540-541.

Pea, R. D., & Kaplan, B. (1982). Lexical development from the perspective of genetic dramatism. In C. E. Johnson & C. L. Thew (Eds.), *Proceedings of the Second International Congress on Child Language* (Vol. 2). Lanham, MD: University Press.

Pea, R. D., & Mawby, R. (1982). The semantics of modal auxiliary use by preschoolers. In C. E. Johnson & C. L. Thew (Eds.), *Proceedings of the Second International Congress on Child Language* (Vol. 2). Lanham, MD: University Press.

Posner, M. I., Pea, R. D., & Volpe, B. (1982). Cognitive neuroscience: Developments toward a scientific synthesis. In J. Mehler, E. Walker, & M. Garrett (Eds.), *On mental representation: Experimental and theoretical studies of cognitive processes and capacities* (pp. 251-276). Hillsdale, NJ: Erlbaum.

Teske, J., & Pea, R. D. (1981). Metatheoretical issues in cognitive science. *Journal of Mind and Behavior*, 2(2), 123-178.

Pea, R. D. (1980). The development of negation in early child language. In D. R. Olson (Ed.), *The social foundations of language and thought: Essays in honor of Jerome S. Bruner* (pp. 156-186). New York: W.W. Norton.

Pea, R. D. (1980). Logic in early child language. *Annals of the New York Academy of Sciences*, 345, 27-43.

Pea, R. D. (1979). Can information theory explain early word choice? *Journal of Child Language*, 6, 397-410.

Pea, R. D. (1978). Piaget and babies abroad. *Contemporary Psychology*, 23, 557-559.

Pea, R. D. (1978). Review of *Play* (C. Garvey) and *Play* (J. Bruner, K. Sylva, A. Jolly). *Quarterly Newsletter of Comparative Human Development*.

## **RECENT SELECT CONFERENCE PAPERS AND COLLOQUIA**

Roschelle, J. & Pea, R. D. (2002, January 7-11). A walk on the WILD side: How wireless handhelds may change computer-supported collaborative learning (CSCL). Keynote Address, International Conference on Computer Supported Collaborative Learning. Boulder, Colorado.

Brecht, J., Chung, M., & Pea, R. (2002, January 7-11). CML – The ClassSync Modeling Language. Technical Paper, International Conference on Computer Supported Collaborative Learning. Boulder, Colorado.

Pea, R. D. (2001, June 27). Roles for technology in teacher learning and education. NECC (National Educational Computing Conference), Chicago, IL.

Pea, R. D. (2001, June 2). Leveraging Distributed Expertise in Learning and Teaching with Technologies. Invited Keynote Address to the International Conference on Intelligent Multimedia and Distance Education, Fargo, ND.

Pea, R. D. (2001, April 11). Integrating web-based video case studies and community tools for teacher professional development. In symposium entitled: "Defining the Video Case: What We Know and How We (Use Video To) Know It," Annual Meetings of the American Educational Research Association, Seattle, WA.

Pea, R. D., Hsi, S., & Baumgartner, E. (2001, March 30). Using Synergy Partnerships to Design Technology-Enhanced Project-Based Learning Environments. Project-Based Learning Conference: "Kids Who Know and Do," San Francisco, CA.

Pea, R. D. (2001, March 13). New technologies for teacher professional development. IIR's 3rd Annual Education Industry Investment Forum, Phoenix, Az.

Pea, R.D. (2001, February 27). Frameworks and tools for on-line teacher development support. Invited presentation to the Executive Board of the AACTE (American Association of Colleges for Teacher Education), Dallas TX.

Pea, R. D. (2001, February 19). Developments in distributed learning environments for middle school mathematics and teacher learning. AAAS Forum for School Science and Mathematics, Symposium: A Fresh Look at Technology in Support of Learning by All Students. San Francisco, CA.

Pea, R.D. (2001, January 24-25). Symposium on Improving Learning with Information Technologies (Co-Chair and Moderator). National Academies of Sciences and Engineering.

Pea, R. D. (2000, December 9). Technology, equity, and K-12 learning. Bridging the digital divide: California Public Affairs Forum, Stanford University Law School, Stanford CA.

Pea, R. D. (2000, December 8). Leveraging Distributed Expertise in Learning and Teaching with Technologies. Intel's Education Forum: Trends

and Opportunities in Education, Intel Architecture Laboratory, Hillsboro, Oregon.

Pea, R. D. (2000, November 28-29). Critical tools for a distributed federation of learning technologies R&D: Simware, socioware, and other enablers. NSF Workshop on a Proposed Learning Federation, Washington DC. (also see <http://207.21.219.248/>).

Pea, R. D. (2000, May 26). Towards Integrating the Sciences and Technologies of Learning for Education. University of Washington, Invited Colloquium to PETTT (Program for Educational Transformation through Technology). Seattle, WA.

Pea, R. D. (2000, March 6). Leveraging the web for continuous K-12 mathematics and sciences teacher professional development. Invited address by the Association for Computing Machinery's Symposium for the National Commission for Improving Mathematics and Science Education ("Glenn Commission"). Washington, DC.

Pea, R.D. (2000, February 10). Networked improvement communities in K-12 education. Invited presentation to Doug Engelbart's Colloquium, " An In-Depth Look at The Unfinished Revolution in Computing and Society," Stanford University.

Pea, R.D. (1999, October 7). Learning in the age of collective intelligence. The ITU Conference, Oslo, Norway, Keynote address.

Pea, R. D. (1999, June 2). The sciences and technologies of learning. Inaugural Learning Sciences Colloquium, National Science Foundation, Washington DC.

Pea, R. D. (1999, May 7). Next-generation learning technologies: Critical synthesis. US Department of Education Briefing for Deputy Undersecretary of Education Michael Smith.

Pea, R. D. et al. (1999, April 22). Toward a learning technologies knowledge network. AERA Presidential Symposium on Current Applications of Instructional Theory in Technology. Annual Meetings of the American Educational Research Association, Montreal, Canada.

Roschelle, J., DiGiano, C., Pea, R., & Kaput, J. (1999, March 1-4). Educational Software Components of Tomorrow (ESCOT). Proceedings of M/SET 99. International Conference on Mathematics/ Science Education & Technology. San Antonio, Texas.

Pea, R. D. (1998, November 16). "What's up down south?" Plans and progress from the Center for Innovative Learning Technologies. Invited address, TeleLearning98, Vancouver, British Columbia, Canada.

Pea, R. D. (1998, November 14). "Hot technologies" for net learning advances. Invited address and advisement with the Canadian TeleLearning-NCE Board of Directors, Vancouver, British Columbia.

Pea, R. D. Prospecting the future of learning technologies and communities: Ecological trends and the questions they raise. (1998).

Ameritech Lecture and Plenary Event, Michigan State University, Great Lakes Region Shaping the Future Workshop on Teaching, Learning and Assessment in Undergraduate Science, Mathematics Engineering (sponsored by the National Science Foundation). (June 4). Also keynote address to the Global Learning Conference, Copenhagen, Denmark (October 20).

Pea, R. D. (1998, October 13). Issues in the design of distributed intelligence and the growth of virtual learning communities. Invited address and roundtable discussions for the University of California series on "The University in the 21st Century." U. California, Berkeley, Center for Studies in Higher Education.

Pea, R. D., Schlager, M., & Roschelle, J. (1998, September 13). TAPPED IN and ESCOT as two "partnership networks" for research innovation in learning technologies. Presentation to invited session to the Software Publishers' Association on "Successes in Commercializing Learning Technologies Research-Based Products," Chicago, IL.

Pea, R. D. Learning, Loops, and Literacy. (1998, March 22-25). PCForum (Hosted by Release 2.0, Esther Dyson), Invited Panelist, Tucson, AZ.

Pea, R. D. (1998, February 5). The pros and cons of technology in the classroom: Debate with Larry Cuban. Sponsored by Bay Area School Reform Collaborative, Hewlett Packard Labs, Palo Alto, CA. Transcript and discussions available on the web at:  
<http://www.tappedin.org/info/teachers/debate.html>.

Pea, R.D., Roschelle, J., DiGiano, C., Schank, P., & Schlager, M. (1997, December 18). A flying circus on the collaborative tailoring of educational objects. Invited plenary session of the Third International Conference on

Computer Supported Collaborative Learning, U. Toronto, (Videotape available: Springfield, IL: Center for Educational Television, 60 minutes).

Pea, R. D. Distributed intelligence and the growth of virtual learning communities over the global Internet. (1997, August 7-10). PC97 Keynote Address, Kyoto, Japan, Council for Improving Educational Computing.

Pea, R. D. Implications of the cognitive and computer sciences for science learning and teaching. (1997, March 21-24). Invited plenary address, Annual Meetings of the National Association for Research in Science Teaching, Oakbrook, IL.

Fishman, B., Gomez, L., Pea, R. D., Edelson, D., Lento, E., D'Amico, L., Gordin, D., Kwon, S., O'Neill, K., Polman, J., Shrader, G., Lachance-Whitcomb, J., & Wagner, R. (1997, March 21-24). The CoVis Project: A national testbed for science learning reform. Papers and workshop presented at the Annual Meetings of the National Association for Research in Science Teaching, Oakbrook, IL.

Pea, R.D., & Fishman, B. (1996). The CoVis Project: An Overview. Invited presentation to the National Governors' Association National Education Summit. IBM Palisades Conference Center, Palisades, NY (March).

Pea, R. D. (1995) Learning and teaching with educational technologies: Need for an Internet-Based "Education Depot." Panel on Educational Technologies, President's Committee of Advisors on Science and Technology (PCAST), White House Conference Center. (October 3).