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An Instrumental Perspective on CSCL Systems

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(Editor's note: See full text for reference citations.)

Many theoretical approaches are used to explain how learning can take place via social interaction over networked computers that mostly derive from constructivist and social cognitivist learning theories. Pierre Rabardel's theory of instrumental genesis, which is rooted in activity and developmental theories, is not frequently used or mentioned in the CSCL field, despite its originality and power. It probably suffers from the fact that it has been

mostly published in French and is now mainly developing in the fields of work psychology and ergonomics. Rabardel's approach can be used both at a macro level to analyze the global properties of any kind of instrument-mediated situation and at a micro level to analyze how actual users appropriate a given artifact for a particular purpose in a specific context.

This article proposes a macroscopic analysis of instrument-mediated collaborative-learning situations and CSCL systems based on Rabardel's approach. Such an instrumental perspective helps identify two essentially different classes of CSCL systems and suggest directions for further research.

This article is excerpted from *Computer-Supported Collaborative Learning*, vol. 7 Online First (April 13, 2012). Read the full text by logging in at <http://aect.org> and clicking on Publications.



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JOURNALS

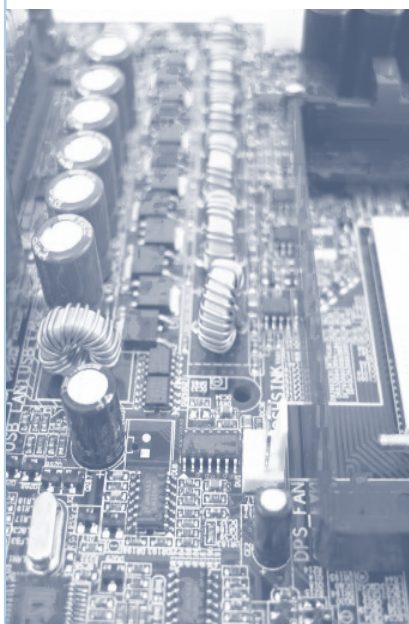
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RESEARCH

The topic this month is tablet-based classrooms. The way of the future?

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International Conference Offers Research Forum on Ed Tech

The International Conference of Educational Innovation through Technology (EITT) will be held August 10-12, 2012, at Tsinghua University in China.

EITT provides a forum for researchers who study technology and education to publish research findings and exchange experiences in conducting related projects.

The conference is organized by the Society of International Chinese in Educational Technology (SICET). As a non-political, nonprofit academic organization, SICET aggregates international scholars and experts in the field of educational technology to encourage academic cooperation and support among members. The main theme of the conference this year is Education-

al Innovation through Technology.

For more information, go to <http://eitt.theti.org>.

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Tsinghua University celebrated its 101th anniversary on April 29, bringing together alumni from around the country and abroad for a weekend of reunions.



Policies Governing Educational Technology Practice and Research

Phillip Harris • Donovan R. Walling

The shifting sands of education policy in the United States and around the world are a constant challenge for those charged with implementation and research. Recent history, say, from the mid-20th century onward is illustrative. Readers will recall that U.S. science and technology education gained considerable emphasis in the late 1950s when the Soviet launch of the first Sputnik satellite on October 4, 1957, moved U.S. President Dwight Eisenhower to call for improved science education. Millions of television viewers and radio listeners witnessed a presidential speech within a month of the Sputnik launch, in which the President “urged Americans to give higher priority to science education and basic research.” Technology got a further boost from the space race that ensued during the presidency of John F. Kennedy and was a beneficiary within the general emphasis on education when ESEA was enacted during the Lyndon Johnson era.



Lag time between promulgation of policy, implementation, and follow-up research and analysis can be considerable—and policy may well have shifted significantly over the period in question. We pointed out previously that the authors of *Transforming American Education*

[the latest national strategy] were cognizant, saying that “research on the effectiveness of learning technology typically comes...too late to result in major improvements—if it comes at all.” However, recognition of this problem does not mitigate its consequences.



Widespread—literally global—belief in the efficacy of educational technology to improve student achievement is intuitive, rather than research based. While research linking technology to school improvement and higher student achievement is accumulating, it often is difficult to locate and to aggregate, as we discussed in the fifth section of this chapter. Moreover, far more research has been done to date, both in the United States and in other nations, that assesses the availability of educational technology in schools and whether professional development has occurred, rather than whether the use of educational technology produces significant positive effects on student learning.

This article is a small concluding excerpt from a new chapter in the forthcoming fourth edition of *Handbook of Research on Educational Communications and Technology*, which is currently in press. Check the AECT website for availability in the near future.

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AECT Mission

The mission of the Association for Educational Communications and Technology is to provide international leadership by promoting scholarship and best practices in the creation, use, and management of technologies for effective teaching and learning in a wide range of settings.

Goals:

- Define the disciplines and professional activities that comprise the field of educational communications and technology.
- Serve and represent professionals in the field and support professional growth.
- Advance scholarship and practice that contribute to and enlarge the knowledge base of the field.
- Promote policies that ensure the humane and ethical use of educational communications and technology at all levels, from the personal through the international.

Instrumental Perspective...continued from page 1

Pierre Rabardel is developing a theoretical framework for the analysis and conceptualization of activities with instruments. The starting point of his analysis is a criticism of technocentric approaches that tend to reserve a residual place to human activity. In these approaches, spontaneous human initiatives are considered “to disrupt, or even damage, the operation of expert automates and machines.” Rabardel favors an anthropocentric approach in which humans occupy a central position and the place of technology is defined in relation to them. He proposes a conceptualization of the mediating instrument based on such an anthropocentric point of view. His research is grounded in constructivist epistemologies, primarily in activity theories, and more precisely on the Vygotskian concept of mediation and the Piagetian concept of scheme.



The existence of a difference between intended and real usage of artifacts is widely recognized and has been studied thoroughly by ergonomists. In some domains this difference is interpreted negatively because it can create dangers and accidents. At the opposite extreme, Rabardel’s theory of instrumental genesis analyzes this difference positively, as the fact that “users contribute to the design of artifact uses,” and more generally “are actors of the overall design movement,” which is “continued in usage.”

By definition, a CSCL artifact conveys some pedagogical intent, which requires that learners use it more or less as anticipated by its designers. An inherent tension exists between learners who elaborate their own instruments, on the one side, and designers/teachers who wish to impose their pedagogical visions, on the other side. A first approach to deal with this dilemma is to avoid associating a particular way of using the artifact with the pedagogical intent. A “learner-instrumentalizable system” only provides means for reaching the objectives and lets the community of learners find its own path. Structures emerge over time from situated practice.



The concept of virtual community of practice...can be an effective substitute, where online participants are likely to play a similar role. In particular, successful open source systems can benefit from a reactive community of developers for quickly solving most technical problems and implementing new ideas.



Louisville This Fall – October 31-November 3

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Springer US

Instructional Science

An International Journal of the Learning Sciences
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Journal no. 11251
Springer Netherlands

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Journal of Applied Instructional Design

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Research Roundup

Tablet Classrooms May Be the Future

With the introduction of Apple's iPad tablet computer, the course of the future classroom seems set on tablet-based learning.

The first generation iPad (third generation came out this year) launched in April 2010 and sold some 300,000 units that month, 14.8 million worldwide by year's end.

The iPad and its competitors have already revolutionized many classrooms around the world, and more are coming online daily. Several areas are feeling the effects:

Accessibility. Tablet computers offer even greater portability than typical laptops, and their smaller size is matched by a smaller price-tag, making them more affordable than traditional computers.

Connected learning. All-iPad classrooms are proliferating to facilitate computer-assisted learning. For example, earlier this year St. Gabriel's Catholic School in Austin, Texas, unveiled a plan to issue iPads to all of its students, who will then be able to access their schoolwork both in the classroom and remotely (Hohenbrink 2012).

Special learning needs. Handheld ease of use makes tablets ideal assistive devices for many learning challenges. For example, last year schools in East Haven, Connecticut, spent more than \$120,000 on 220 iPads to help teachers identify and help struggling readers. According to district officials, the devices will allow teachers to use time previously spent calculating and reviewing reading assessments to work with students or adjust lesson plans (Misur 2012). In Australia, a seven-year-old autistic youth, who used to communicate using only pictures and one or two words, is now speaking in sentences, thanks to an iPad app, according to the *Sydney Morning Herald* (Arlington 2012).

Assessment. The schools in Lowndes County, Alabama (2,000 students) last fall distributed 1,100 iPads to teachers to gather observational data and to gain a glimpse of students' thought processes. In Montclair, New Jersey, at Mont-

clair Kimberley Academy, a K-12 private school, Reshan Richards, director of educational technology says, "You can gather a lot of data quickly, and you can do a lot of quick checks of understanding in a class, but I'm more interested in the deeper, more qualitative understanding that mobile might bring" (Ash 2012).

Textbooks. Schools also are making the move away from traditional paper to digital textbooks. In March U.S. federal officials set a goal to have a digital book in every student's hands in the next five years, after Apple announced plans to partner with publishers to offer titles for under \$15 (the program is called iBooks textbooks) and to provide a free application that makes it easy for anyone with a Mac to create a digital book. School districts in the San Diego, California, region planned to join others in the state and country in putting high-tech tools in the hands of students to use educational apps and electronic books to augment and even replace traditional textbooks (Kucher 2012).

The iPad (and to a lesser extent its competitors) is an international phenomenon. When the latest version was launched in March, a shortage found Russians flocking to Tokyo to get their new iPads, according to *Pravda.ru*. Tablet classrooms of the future are already a reality in many schools—and the numbers are rising.

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