

Teaching and Learning in Stanford's Smart Classrooms

Advanced technologies:

How can technologies offer innovative learning solutions?

How can we best use learning technologies in a pedagogical way?

Initial Thoughts and Research Interests

- ➔ Importance of **active, lifelong learning**
- ➔ **New technologies** as an integral part of university learning and teaching



(1) **Learning in Activity / Active Learning?**

+

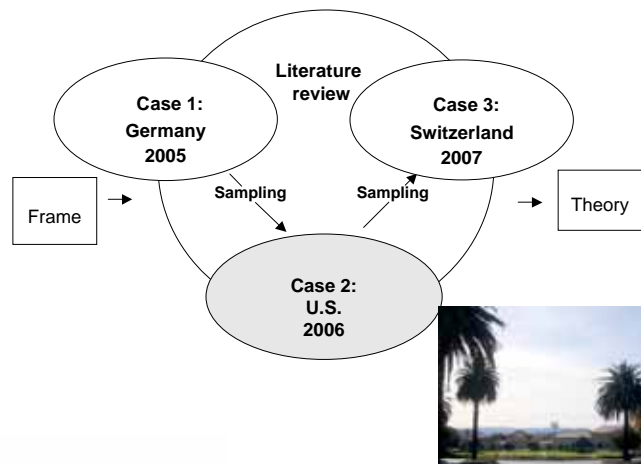
(2) **Design of technology-enhanced learning environments?**

Lack of innovative pedagogical theories and concepts!

➔ **Investigate pedagogical and technological innovations!**

Research Design: Ethnographic Case Studies

Technology enhanced environments



Theoretical Background - Two views of learning



Jean Piaget
1896 - 1980



Lev Vygotsky
1896 - 1936

Cognitive, acquisition-orientated

= learning and knowledge as pertaining mainly to individuals' transferable cognitive attainments



Individuals' (solo) knowledge construction

Situative, participatory-orientated

= learning as a highly situated activity of participation



Socially-based participatory construction of knowledge

Emphasis

Pedagogical Innovations: Active Learning

Active lifelong LEARNING

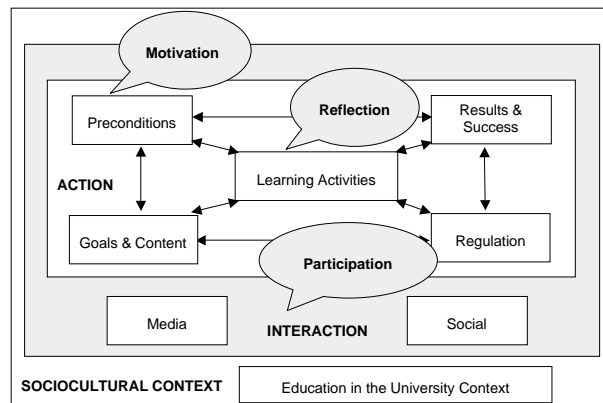


**Learning in Activity/
Active Learning**
(Greeno 2006, Pea 2006)

self-motivate
be self-regulated
actively engage within a learning community
utilize new technologies



Theoretical Framework - Situative Approach



Pedagogical Innovations: Four perspectives on Learning Environments

Four perspectives on learning environments (Bransford, Brown & Cocking, 2000):

(1) Learner-centered

"Has the instructor discovered something of each learner's background knowledge, interests, and social and cultural values, and has he helped them become aware of how these things impact their opinions and perspectives?"

(2) Knowledge-centered

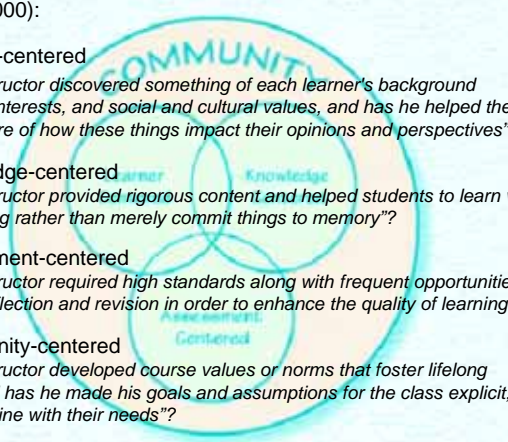
"Has the instructor provided rigorous content and helped students to learn with understanding rather than merely commit things to memory?"

(3) Assessment-centered

"Has the instructor required high standards along with frequent opportunities for feedback, reflection and revision in order to enhance the quality of learning?"

(4) Community-centered

"Has the instructor developed course values or norms that foster lifelong learning, and has he made his goals and assumptions for the class explicit, and are these in line with their needs?"





Stanford Center for Innovations in Learning (SCIL)

Established in 2002 as an independent center at Stanford University; housed on the second floor of the new Wallenberg Hall, a state-of-the-art testing ground for technology applications in the classroom.



* Scholarly research to advance the science, technology and practice of teaching and learning.

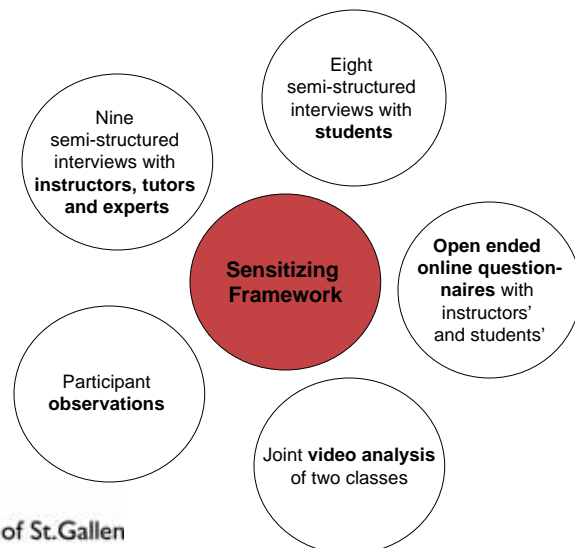
* Advisory and technical support to faculty teaching in the building.

<http://scil.stanford.edu>

<http://wallenberg.stanford.edu/>



Case Study 2: Stanford University



Technological Innovations: High performance learning spaces

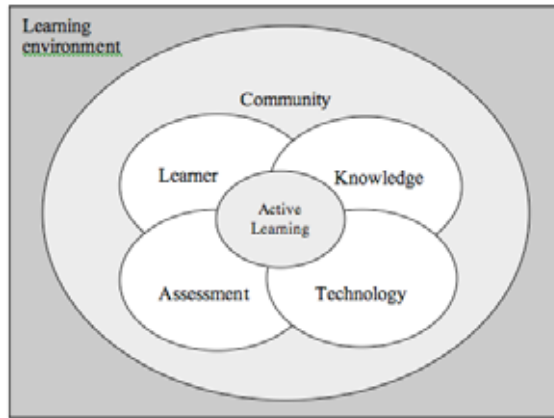
State-of-the-art classrooms at Wallenberg Hall, Stanford University

<http://wallenberg.stanford.edu/classresources/technologies.html>:

- **“Low-tech” equipment** (e.g., lightweight, easily foldable tables and lightweight chairs on casters, portable whiteboards, breakout areas near the classrooms)
- **“High-tech” equipment** (e.g., two big screens, known as Websters enable fast and easy Internet access and annotation techniques, and video conferencing, laptops for students)
- **Course Management system CourseWork**
CourseWork, a university-wide course management system, currently applied by 900 courses



Consequences for the design of learning environments



Challenges and Opportunities: Instructors and Students

Instructor

- fosters professional, technical, learning, and social skills
- provide an organized course and knowledge structure as well as possibilities for formative feedback
- facilitates the active role of the students, responsibility for their individual/joint learning processes
- makes valuable use of new technologies

Students

- active originators of their learning
- engaged in self-study forms while applying methods and strategies of the discipline
- perform, share, and compare their thinking and understanding in representational practices, creating joint knowledge (discussion)
- actively reviewing and improving their own understanding (metacognition), opportunities to revise thinking continuously (immediate feedback)
- making full use of environmental resources like cultural artifacts and social mediators within and outside the classroom

Contact

Sabine Hoidn
University of St. Gallen
Switzerland

Email: Sabine.Hoidn@unisg.ch