Fostering Creative Learning

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CREATIVITY IN AMERICA

THE SCIENCE OF INNOVATION AND HOW TO REIGNITE OUR IMAGINATIONS

BY PO BRONSON & ASHLEY MERRYMAN
THE CREATIVITY CRISIS

FOR THE FIRST TIME, RESEARCH SHOWS THAT AMERICAN CREATIVITY IS DECLINING. WHAT WENT WRONG—AND HOW WE CAN FIX IT.

BY PO BRONSON
AND ASHLEY MERRYMAN
THE INNOVATION ECONOMY

SPECIAL REPORT The technologies and new ideas that are changing the world

PLUS Voices of Innovation
STEVE JOBS CRAIG VENTER
TIM BERNERS-LEE SHIRLEY ANN
JACKSON YUAN LONGPING
CHERRY MURRAY JEFF HAWKINS
ROGER McNAMARA FIDOR CHAND
KOHLI AMORY LOVINS & MORE
educate next-generation innovators
deepen science and engineering skills
explore knowledge intersections
equip workers for change
support collaborative creativity
energize entrepreneurship
reward long-term strategy
build world-class infrastructure
invest in frontier research
attract global talent
create high-wage jobs

INNOVATE AMERICA

NATIONAL INNOVATION INITIATIVE SUMMIT AND REPORT
thriving in a world of challenge and change

Council on Competitiveness

2005
• Increased Higher Education quality and funding
• Increased R&D funding
• Better K-12 education

Missing: An understanding of how innovation works, how people learn for creativity, and how to design creative learning environments
Web 2.0

YouTube
Facebook
The Blogosphere
Wikipedia
Flickr

→ Collective Intelligence
The Creative Classroom

• The core is collaborative conversation
• Constructivist learning conversations are improvisational
• Teacher and students build knowledge together
• Unexpected insights emerge

(Sawyer, 2011, Structure and Improvisation in Creative Teaching, Cambridge)
Teaching and Learning for Creativity
Instructionism

- Knowledge is a collection of static facts and procedures
- The goal of schooling is to get these facts and procedures into students’ heads
- Teachers know these facts and procedures; their job is to transmit them
- Simple facts and procedures should be learned first
- To evaluate learning, assess how many facts and procedures have been acquired
Problems with Instructionism

• The knowledge acquired is relatively superficial
• Retention is low
• Transfer to new situations is weak
• Ability to integrate knowledge is weak
• Ability to work adaptively with knowledge is weak

→ No learning for creativity
The Innovative Learner

- Deep understanding of complex concepts
- Ability to manipulate concepts creatively
- Integrated knowledge
- Contextualized knowledge
- Ability to innovate collaboratively

(Sawyer, 2006, *The Cambridge Handbook of the Learning Sciences*)
Active Learning

• Students work with, and use, facts/skills/concepts as they solve complex real-world problems

• Students work in collaborative teams because the tasks are demanding

• The professor guides and supports students as they work on their projects and problems
The Key Components

• Start with a problem or design challenge
• Students explore the problem through inquiry and discussion
• Students work to find solutions
• The process must be guided by the instructor
• Students create tangible products that address the problem
• Prototypes and sub-tasks are presented frequently for critique
Four Challenges For Instructors

1. Identifying a good problem or design challenge
2. Helping students learn actively
3. Fostering effective collaboration
4. Supporting the creation of shared artifacts and effective critiques
[2] Creative Learning Environments
Interactive Science Centers
InvenTeams (Lemelson-MIT)
Integrated Teaching and Learning Laboratory (UC Boulder)
Wireless Handhelds

Student in group

Student groups

Observer windows

Students yet to be assigned to groups
The Creative Campus
In innovative organizations, professionals:

- Continually learn
- Work collaboratively
- Engage in “mutual tinkering” where small sparks add up to big ideas
- Change teams, assignments, and organizations frequently

The Creative Campus

• Fluid boundaries
• Flexible organizational structures
• Groups form and disperse spontaneously
• Ideas flow between teams
• Everyone creates
The Take-Home Message

• Creativity is more important to our students and our society than at any time in history.

• Recent research shows us how to give students the kind of knowledge required to be creative:

• Teachers and students collaborate in creating knowledge together through active problem-based learning.
THANK YOU!

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