



The Second International Conference for Learning and Teaching

Smart 
Learning

Think Smart Before You Start
29-30/03/2017

SMART Learning: Its Origin, Evolution and Future

John H. Knight

Lives are changed

when **people** connect.

Life is changed

when **everything** connects.

Qualcomm motto

What is Smart Learning?

An **Educational Ecosystem** that:

Uses intelligent technologies (e.g., The Cloud) to gather, analyze and direct data to improve learning and teaching.

Uses the analyzed data to develop personalized and adaptive learning.

From Learning Styles

through

“Recent” Computer History

to

Smart Learning

MULTIPLE INTELLEGENCES

Howard Gardner.

*Frames of Mind: The Theory of
Multiple Intelligences.*

1983

1. Logical-mathematical (logic, abstractions, numbers...)
2. Verbal-linguistic (reading, writing, story-telling...)
3. Visual-spatial (spatial judgment, navigation, visualization...)
4. Musical-rhythmical (sound, tone, rhythm, composing, music...)
5. Bodily-kinesthetic (control over body movement—sports, dance...)
6. Interpersonal (sensitivity to others—sales, social workers...)
7. Intrapersonal (self-reflection, introspection, philosophy, religion...)
8. Naturalistic (sensitivity/insight into natural world—farming, botany, naturalists...)

Intelligence is

“a biopsychological potential
to process information
that can be activated
in a cultural setting
to solve problems
or create products...
made in a culture.”

THE COMPUTER EVOLUTION

TRS-80A

1977

24 Kbs



APPLE II 1977-1988

II—1977 4 Kbs

II+—1979 48 Kbs

IIe—1983 64-128 Kbs

IIc—April 1984 & color

IIGS—September 1986

to 8Mbs

IIC Plus—1988



MACINTOSH
JANUARY 1984 128MBS
\$2495!



LAPTOPS: FROM CLUNKY TO...

Osborne 1 1981 \$1195



Epson L3s 1988 \$1800



APPLE IMAC G3 "CLAMSHELL" 1999 \$1599



MICROSOFT

Windows—20 November 1985

**Answer to Apple's GUI for
IBM-based computers**

CAI—COMPUTER ASSISTED INSTRUCTION

- **Books to screen—writing mechanics/grammar; mathematics' drills; multiple-choice; fill-in-the-blanks; forms.**
- **AT&T's Writer's Workbench—text analysis (1984 release to public).**
- **No GUIs, no mouse technology, no color; all keyboarding.**
- **Individualized pacing; repeatable and reinforcing skills' practice; fostered commercial interest in CAI modules and CAI research.**

Moore's Law

Computational power [microchipprocessing speed and capacity] will double roughly every two years at the same innovation cost each period.

Gordon Moore, Intel Co-Founder

THE WORLD WIDE WEB—INTERNET

Early 1980s—US government and select research HEIs

**National Science Foundation: public development of
ARPANET (US academic and military use)**

Early 1990s: World Wide Web/Internet

WWW EFFECT

INTERNET-CONNECTED DEVICES

1984	1,000
1992	1,000,000
2008	10,000,000,000
2020	50,000,000,000 forecasted*

*Thomas Friedman. *Thanks for Being Late* (2016)

2006-2008

26 September 2006: Facebook goes public

2007: Twitter, Kindle

2007: IBM begins work on Watson, a “cognitive computer”

Jan 2007-Dec 2014: AT&T’s mobile data usage: + 100,000%

1990s: Google, Yahoo, Firefox and more

SMART LEARNING

- 1. Aims to provide**
 - Self-adjusting, self-motivating, personalized educational systems that**
 - Respond to the needs of a variety of learners**
 - Recognize the learners' competencies, learning styles and interests**
- 2. Rests on formative learning and evaluation**
- 3. Provides personalized, continuously adjusting assignments based on data analysis from multi-source assessment (self, peer and institution)**
- 4. Strong emphasis on learner responsibility and self-discipline**
- 5. A student-centered and service-oriented educational ecosystem**

CRITICAL FEATURES

1. Self-direction: active engagement of student in the learning process
2. Inherent motivation built into lesson designs
3. Adaptive: adjusts to each student's aptitude, background, skills and learning style/preferences)
4. Resource rich: technological and human resources

INSTITUTIONAL GOAL

SMART Learning should create

“technology-supported learning environments
that implement adaptations and provide appropriate support
in the right places, at the right time,
based on individual learner needs.”*

*UNESCO Post-2015 Development Agenda

GOALS OF SMART LEARNING

1. Primary Goal: *deep learning*
 - Critical thinking
 - Problem solving
 - Effective application of principles and knowledge to new, unfamiliar problems/issue/tasks
2. Developing each student's capacity to learn and integrate life-long learning habits
3. Create and implement learning through vehicles like CBL and PBL

KEY ATTRIBUTES OF A SMART COURSE

1. **Learner-centric design:** high level of engagement between course and digitally smart learner
2. **Design adaptivity:** feedback and course sequence based on learner performance to ensure that learner gets appropriate formative information at the right time
3. **Emphasis on learning-by-doing:** active course design allows learner to interact meaningfully with instructional materials.
4. **Enabling feedback loops and continuous improvement, e.g., “feedback generated by data. The data collected from the smart course informs ongoing improvements.”***

***Dror Ben-Naim. “What Makes a SMART Course Smart.”**

SMART Learning System Characteristics

- A. Learner centered**
- B. Adaptive curriculum: adaptive to learner needs**
- C. Formative, not summative evaluation: learning experience helps learner to improve continuously and does not punish inevitable failure in learning.**
- D. Self-direction, with professional guidance: Teacher becomes “The Guide on the side, not the Sage on the Stage.”**
- E. Practical outcomes: usable in life (community or professional)**
- F. Culturally informed**
- G. Community connected, and thus...**
- H. Motivational**

SMART Learning System's Benefits

- A. Responds to 21st Century student needs:
*Digital Natives, not Digital Immigrants
- B. Shifts learning responsibility to learner with
Institutional guidance
- C. Develops a self-motivated learner who can
design a program to fit her/his professional goals
- D. Provides teacher/institutional with empirical data to become
more effective in nurturing highly skilled graduates

SMART Learning System's Challenges

- A. Resources: human and financial
- B. Time: faculty development, staff development, and student orientation
- C. TQM student complexity: continual analysis, readjustment, replanning, re-implementation, etc.
- D. User Friendly technology for Digital Natives
- E. Institutional inertia: “Get on the train or be left behind

The Institutional Challenge

“Transforming learning is a complex activity that frequently necessitates reconsideration by teachers of what constitutes ‘teaching’ and ‘learning’.

It requires sophisticated reasoning about the goals of intervention, the design of evaluation and the interpretation of the results within a particular context.”

Adrian Kirkwood and Linda Price.

“Technology-enhanced learning and teaching in higher education...” 2013

The High-Speed SMART Train has left the Education Station!

