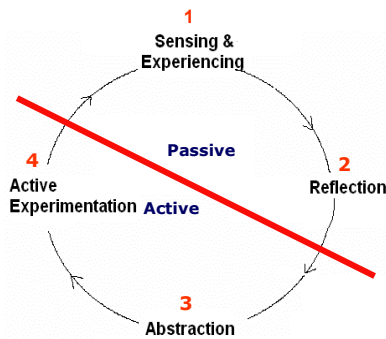


A

Paradigm Shift: the Information Age Requires Active Learning Personalized Learning Can Help Individuals Use the Power of Their Emotions!

1. Emotions are essential to learning. Up to now, the study of emotions has been considered too subjective or immeasurable for modern science since we have not had the technology to measure emotions concretely. Now, neuroscientists are measuring how emotions create and strengthen synaptic connections in the brain and measuring how professionals have developed many more synaptic connections through education. Advances offer valuable insight in helping us see how emotions impact learning. In contrast, advertisers and sport psychologists have long known about the impact of emotions and have been more innovative in tapping into emotions to enhance sales and performance.



Our education models overlook the impact of emotions on learning:

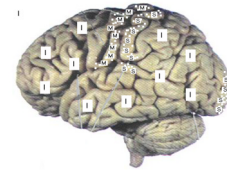
- a. Developed in the Industrial Age and still used today, our teaching and learning models are obsolete for today's more sophisticated need for educated, innovative knowledge workers.
- b. We are still using passive, one-size-fits-all solutions, not active learning and personalized education models that can help students tap into emotional resources, master emotions, support the learning process, and achieve true potential, which is key for innovation. The old models encourage passivity by supporting memorization, rule-based learning, and one-size-fits-all and sage-on-the-stage instruction.
- c. We are still using primarily cognitive models that overlook the significant impact of emotions on learning. In contrast, the humanistic approach uses emotion to fuel motivation, persistence, innovation, and achievement.

2. Innovation and higher-order thinking in the Information Age is critical. Innovation underpins the growth of nations and depends on education that fosters the achievement of a talented workforce. The Council on Competitiveness shows that we have dropped to second place in world innovation capability. The National Science Board reports a troubling decline in the number of U.S. citizens who are studying in fields that require higher-order thinking skills and innovation. Today's challenge as a nation is to find solutions that encourage more active-thinking knowledge Information Age workers who want to make learning "a rewarding part of everyday life." Unfortunately, if we are still using yesterday's industrial-age education models, we will continue to create a passive workforce that lacks higher order thinking and decision making abilities and lacks training for today's constantly changing, information-seeking world.

3. Business leaders and Education must collectively push for a major paradigm shift to meet the information and decision-making needs pulling today's workforce. The lack of systemic change in education is creating a crisis that must be urgently solved. Only 32 percent of all students leave high school prepared for a four-year college" (Gates Foundation, 2004). Of those, 28% require remedial courses. Research suggests that improving thinking and innovation requires a comprehensive understanding of the psychological factors that impact synaptic creation. Not understanding learning processes results in stress, dissatisfaction, attrition, retention problems, wasted

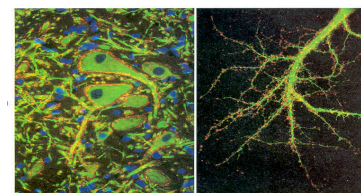
Emotions Impact More Than Just the Heart

S=Sensing
I=Integrating
A=Action



Source: Zull, Art of Changing the Brain (2002)

Learning Creates Dendrites – Brain Development



Source: Griffith & Zull

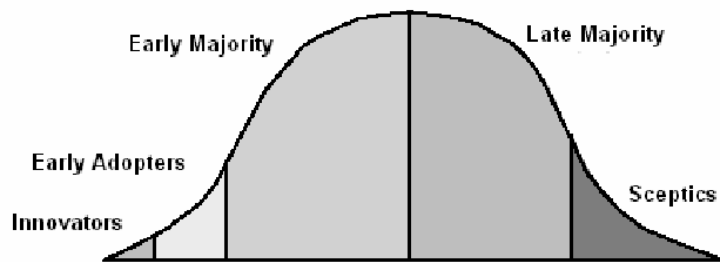
resources, and the lack of brain development. Systemic change means developing new Information Age learning models that can use personalized strategies to harness the psychological sources that drive learning. Using personalization and just-in-time environments, learners can sense, synthesize, create new knowledge and act upon decisions continuously—emotions fuel this iterative process. To develop problem-solvers and thinkers who want to become lifelong learners, we need to show them how to tap into passions and actively involve them in the thinking, decision-making, and innovation process.

4. Large populations have unsophisticated cognitive ability and are unable to use today’s technology. Rapid advances in many technologies are changing the way people learn and how people are able to develop their brain. Education and corporations can equally prosper by understanding these changes and using emerging technologies to deliver personalized instruction matched to the increasingly “neomillennial” learning needs. The challenge of developing innovative technology is finding and supporting an equally sophisticated, lifelong learning audience that can embrace and keep pace with every new innovation and change. Failure means that new technologies may create cognitive overload, attrition, stress, and lack of product use. Build it and many may not come.

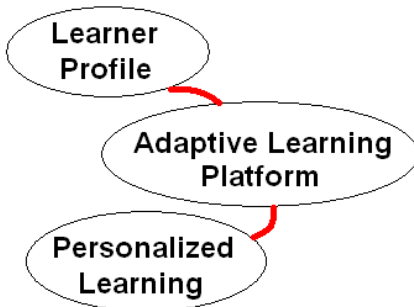
5. In creating systemic change for the Information Age we must deepen our knowledge about individual differences in learning. Increasingly, learners are getting used to personalization and want education customized to their individual needs. Personalization requires that we better understand why some individuals are more prepared to use their emotions to succeed. Neuroscience research advances make it vitally important

that we tap into the dominant power of emotions on learning, memory, attention, values, and persistence to help those who are less emotionally prepared to learn. We can no longer afford the luxury of overlooking the impact of emotions and need for personalization, technology can help us.

Diffusion of Ideas and Products using the Innovations Theory



Brain-Based Learning



6. A brain-based “Learner Profile” that recognizes individual differences in learning can reliably adapt personalized instructional solutions. It can use “research foundations” to provide targeted, scalable solutions and infrastructure effectively. It can help develop more self-motivated, self-directed, and autonomous learners who can strategically harness the power of their emotions to innovate. High attrition rates demonstrate that in technologically mediated environments less sophisticated students will fail or drop out if emotional needs are unmet, especially those who are more dependent on instructors and social interaction. Emotion is the trigger that drives the learning process and the mortar that cements memories for brain development and more

successful learning and performance. To introduce more sophisticated technology and solutions, large populations of unsophisticated users and learners can benefit from using a learner profile that can recognize and adapt to individual differences in learning and suggest targeted interventions and support.