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### **Learning Environment for the 21<sup>st</sup> Century**

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Traditional methods of education delivery that I practiced in my over 30 years in academia as a professor and department chair are in the midst of dramatic change. Disruptive innovation is penetrating the usual and customary, challenging traditional barriers and paving the way for startling and exciting opportunities. Part of the discourse in higher education communities involves redesigning the way we do business.

Despite the new technologies available in the 21<sup>st</sup> Century, the debates about higher education are not new. This paper will begin by touching on the history of higher education to demonstrate the timeless nature of higher education themes, move to current societal trends and disruptive innovations, and end by suggesting future trends. Exploring the structure and nature of new systems that will take higher education into the future requires a critical dialogue and provocative ideas. The presented suggestions may be unrealistic or unmanageable but offer unencumbered ideas as a place to begin.

#### **LESSONS FROM HISTORY**

Looking at the turn of the 20<sup>th</sup> Century, the philosophy of capitalism was no longer confined to the wealthy class but spread to the professional and working classes as well. Demands grew that education on all levels become more practical and train people for the profitable industrial and business pursuits. The country, starting off on an aristocratic theory of higher education, subsequently swung to a democratic theory.

As college became accessible, more people attended, but their qualifications varied. In an attempt to establish standards, objective tests were given to improve grading, college entrance exams were administered to improve the quality of entering college students, and the curriculum was revised. Educators supported the development of academic standards but expressed concern about defining and reverting back to a closed and limited system.

In 1910, articles in *The World's Work* and *Educational Review* reported 14 areas of concern reflective of institutional quality. These areas included: quality of teaching; teaching versus original investigation (research); inefficient teachers; improvement of instruction; the need for a standard curriculum; the poor quality of college graduates; the lack of accountability to the public; the lack of a

clear mission of a state university; unwise expansion of programs; imitation and rivalry among institutions; the college of letters and science versus the professional schools and the non-professional graduate school; the need for supervision of beginning teachers; the need for overhauling, reorganizing, and strengthening of colleges of letters and science in state universities; and the financial resources of state universities which were in competition with endowed institutions. (References available upon request).

### **SOCIETAL TRENDS DRIVE REDESIGN**

Although many of the emerging themes in higher education persist over time, several additional factors drive the 21<sup>st</sup> century redesign. Demographically, the learners span the generations of boomers, Xers, and millennials that vary by values, relationship to work, and technological skill [1,2,3,4]. The second driver of change emanated from global and environmental concerns, namely traffic gridlock, pollution, and dangers from bioterrorism, infectious diseases, and violence [5]. All learners face increased stress, more time pressure, job instability, and increasing costs of living. The final force driving change is the versatility of technology commingled with demographics and environmental issues. Eventually, the public became more comfortable with technology, accepted the loss of privacy, and began telecommuting from home [6]. In education, technology allowed long distance delivery to geographically remote regions and access to important databases [7]. Higher education bolstered its infrastructure and incorporated new approaches for education such as hand-held computers, wireless phones, long distance delivery, web-based education, e-mail, and e-testing.

### **FORECAST FOR 21<sup>ST</sup> CENTURY HIGHER EDUCATION: REDESIGN THROUGH INCREMENTAL CHANGE**

According to futurists, the overarching goal is to design beyond the information age and strive for changes in mental structure or ways of thinking. Charting pathways to the unknown is best started with incremental changes [8]. Consistent with this recommendation, higher education is charting new pathways and breaking away from established patterns by initiating incremental changes. The following provides a forecast framework accompanied by a brief description and the incremental changes currently in practice in higher education. The next section describes future trends under the same framework components.

#### **Forecast Framework**

Method: Increased Technology, Universal Access, and “Edutainment.”

Means: E-teaching and Educator/Mentor/Coach

Product: Outcomes and Process

Purpose: Human Attention

#### **Forecast Components Illustrated by Incremental Changes**

##### **Method: increased technology, universal access, and “edutainment.”**

Increased technology with portable, wireless communication connects 24/7/365 and gives power to the learner. Ownership of the classroom no longer exists. Everything is connected to everything and is decentralized. Universal access presents no language barriers for global learners. Edutainment contains learning modalities with the following: multilink, multitext, e-texts, graphics, audio, animation, simulation, imaginative, virtual reality, creativity, interconnected, interactive.

##### **Incremental changes**

- Distance learning and wireless transmission are becoming more prevalent, easier to manage, and readily accessible through cellular telephones. Increasingly important as a transnational communications medium, more United States users will eventually utilize only cellular service. The

number of mobile phones in use is approaching 1 billion globally allowing access to the Internet for data, e-mail, multi-media messages, and streaming video [9].

- The growth of electronic games and simulations. The Millennials do not tolerate being communicated “at” but expect interactive engagement and are good at multi-tasking and parallel processing. They can access information in a non-linear manner through hyperlinking and are accustomed to good graphics [10].
- In higher education, application software is proliferating. (MIT) [11].
- High schools in 25 states and 8 countries participate in “Virtual High School,” allowing their students to select from nearly 150 accredited online courses including core, elective, advanced placement, and international baccalaureate offerings. [12].

### **Means: e-teaching and educator/mentor/coach**

E-teaching allows educator portability that enables faculty-sharing across boundaries, i.e. institutions and states, globally. Teacher experts will create electronic curriculum guideposts and create e-texts and guides.

Educators/mentors/coaches will design disposable curricula for one and guide the course of study.

### **Incremental changes**

- Private companies are contracting with public education agencies to provide various services, including school management. [13].
- A proposed faculty job description that includes custom-designing educational program for the individual student, assessing the student’s job history, academic transcripts, career objectives, and learning style, and lectures replaced by technology that accesses talks by world renowned scholars [14].

### **Product: outcomes and process**

Outcomes measure/assess/evaluate the learner’s knowledge, ability and skill gained from sources in the universe. Decreased focus on process permits teachers to apply the best ways for learners to learn electronically, such as simulations or virtual learning environments.

### **Incremental changes**

- Ohio’s Board of Regents is in the process of allowing students to transfer coursework and degrees between state institutions without unnecessary duplication or institutional barriers, promoting maximum options for students [15].
- In Wisconsin, 16 technical colleges adopted a statewide nursing curriculum effective 2004. Students can choose online or traditional methods for theory and instructors can individualize learning activities and delivery. All programs teach to the same standards and learners will achieve the same skills [16].
- Drexel University will give free iPods to students to spark innovative teaching and to capture the interest of students – then ask those students to develop their own ideas for incorporating the technology into teaching. Creative ways to use technology is the mission [17].

### **Purpose: human attention**

The reason for change - the only true scarcity is human attention. Education must capture the attention of the learner who must demonstrate enough knowledge, skill and ability to meet course/program objectives. One way to capture attention is by R-tech, relationship techniques, described by Kelly [18]. The steps include: create remember, anticipate, and change what the learner wants. The relationship is reciprocal.

### **Incremental changes**

- Select classes at the University of Texas El Paso use remote control devices in the classroom to assess each student’s learning. Based on the immediate feedback, students break into small learning communities to review areas which revealed lack of understanding. Follow-up responses demonstrate

improvement, supporting the effectiveness of learning communities and relationships among students and the teacher.

## **FORECAST FRAMEWORK ILLUSTRATING MORE CHANGES IN HIGHER EDUCATION**

These implemented incremental changes demonstrate major nontraditional shifts in higher education and clearly indicate the move away from the status quo. To further prod higher education toward revolutionary innovation, more change is needed such as those discussed in the following recommendations.

### **Method: increased technology, universal access, and “edutainment”**

**TREND 1** Integrate classroom lecture and dialogue by electronic transmission. The method of learning will not matter as much as the student’s ability to demonstrate what they know. Personalized learning and testing situations will be rapidly transmitted electronically through safe, secure and confidential systems. Electronic textbooks (e-texts) will be imbedded with pictures, videos, and simulations. Simulations would be “games” without words depicting actual events requiring the learner to respond interactively to the situation. “Edutainment” devices (education delivered using multilink, interactive, entertainment approaches) will support learning and contain graphics, sound, animation, as well as simulations. Higher education will be available globally, with direct, real-time language translation as needed.

### **Means: e-teaching and educator/mentor/coach**

**TREND 2** In student-centered learning, teachers will interact with individual students, assess learning, and guide each student through a curriculum designed just for him/her. Instead of faculty being the controller of information, the teacher will be valued for his/her intellectual capital, guiding new learners to access materials electronically and seek assistance as needed. Teachers will have flexibility in negotiating contracts with purveyors of education and as content managers, to create and revise materials for the electronic media. Faculty may also be entrepreneurs and/or star professors – marketing directly to the student or to private education distributors.

### **Product: outcomes and process**

**TREND 3** “Test-for-one” will require critical thinking, judgment, and handling ambiguous situations, and it will incorporate simulations and linked items. It will also be electronically evaluated with immediate results generated to the student and teacher. Courses and programs will have rolling timeframes. Learners will demonstrate achievement and competence in meeting objectives and then move on seamlessly to the next set of objectives. This means individual learners will complete modules of objectives, learning experiences, and competency measures at different intervals and “graduate” anytime. Lifelong learners can return to the system as needed. Learning requirements/objectives will also emphasize what the learner knows and demonstrates, rather than the length of time or method used by the learner to obtain the information [19].

### **Purpose: human attention**

**TREND 4** Efficient and effective use of time in keeping the mobile learner’s attention is the major component of this e-world. Higher education faculty must capture the attention of the learner, who must demonstrate enough knowledge and ability to meet outcome measures.

Applying the Kelly [18, p125] relationship techniques (R-tech) model to higher education, educators will develop a relationship with learners to customize a learner-centered curriculum based on the learner’s preferences and needs, and by offering choices. In turn, learners will provide input into the education process by evaluating software, modules, and e-books. Educators will have an electronic profile of the learners which show their patterns, preferences, and habits. The future role of educators is by relationship, assisting users to manage their education and navigate the education system.

## CONCLUSIONS

Even with the innovations implemented to date, the challenge still remains for more institutional reform and policy changes in higher education that would elevate education beyond the age of knowledge. Microsoft Chairman Bill Gates (2005) spoke at the Educational Summit on High Schools. Although speaking about high schools, his comments are appropriate for higher education as well.

*America's high schools are obsolete. By obsolete, I don't just mean...broken, flawed, and underfunded...I mean our high schools – even when they are working exactly as designed – cannot teach our kids what they need to know today.*

*Our high schools were designed 50 years ago to meet the needs of another age. Until we design them to meet the needs of the 21<sup>st</sup> Century, we will keep limiting – even ruining – the lives of millions of Americans every year. [20]*

The following are some of the more significant thought provoking questions that are currently being deliberated in higher education:

- Is tenure still relevant [21]?
- What is the future of expensive-to-maintain physical plants with bricks and mortar classrooms [21]?
- Are degrees relevant in a society that requires life-long learning [21]?
- What will society value? For example, what will be the status of institutional autonomy, honesty, civility, personal and social responsibility and ethics [21]?
- What is the best business model in the new electronic learning environment?

Unquestionably, the opportunity exists in academia for revolutionary innovation. The cited incremental changes demonstrate the beginning of transitional reforms in current practice, followed by suggested trends. Higher education has reached a critical crossroad and consequently, there is an urgent need for imaginative and resourceful leaders and educators to continue challenging traditional ways of thinking and to restructure education far beyond the information age.

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**POINTS FOR THE CLASSROOM** (send comments to [forum@futuretakes.org](mailto:forum@futuretakes.org)):

*The author asks several thought-provoking questions! To these, let's add more.*

- *What subjects will be taught 20 years from now? The same ones that are taught now, or will there be a shift in the balance between the sciences and the arts? What new areas of learning, neither science nor art, will emerge?*
- *Will specialized studies or generalized studies prevail in 20 years?*
- *What will be the correlation between degrees and courses of study on one hand and careers on the other?*

- *Will the classics continue to survive in the classroom, and what new works will be added to them?*
- *What else does “design beyond the information age” encompass?*
- *Finally, will a new understanding of the brain lead to new modes of education beyond the lecture hall and the classroom?*