Disruptive Innovation

The Rush to Technology in Higher Education

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Why Listen to Me?

- <u>The Fiscal Perspective</u>: Background in Finance; a ten year member of ERC and the Statewide Fiscal Affair's committee.
- <u>The Political Perspective</u>: a Senate Exec committee and statewide Governmental Affairs liaison to the California Legislature.
- <u>The Technology Perspective</u>: Author/Reviewer of "Online Instructional Technology Policy" for the ASCSU and on various CIO search and Faculty Technology committees.

I Have Three Points to Make Today

#1. What is <u>THE</u> Issue in Higher Education today?

#2. What is Disruptive Innovation and why is Technology being pushed as the Disruptive Innovation solution?

#3. What are the untended consequences of such Disruption and how can we monitor it?

Point #1 THE Issue in Higher Education

- State Support continues to decrease
- Enrollment continues to increase
- Facilities continue to age without replacement

Fiscal Facts:

- State Support continues to decline, particularly at the CSU (general funds support down 1/3 since 2010; 37% in 2015-16).
- Enrollment is up 11% since 2010, especially first generation college students from lower income families (target is 1% we are 4%; 77% of students are now supported: SUG, Pell, etc.)
- Fulltime faculty hires continue to be net negative (hiring is at all time high [750 last year] yet tenure density continues to decline; [currently at 56%]).
- <u>No</u> new construction funds going forward (construction now comes out of operating funds and <10% state money for immediate deferred maintenance needs)

Chancellor's Message

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2016-2017 Support Budget

Financial Aid and Tuition Rates

CSU and California -	Historical FTES Enrollment		
An Integral Partnership	Year	Target ¹	Actual
Three-Year Budget	2001/02	305,854	316,396
Summary	2002/03	321,132	331,353
Budget Highlights	2003/04 ²	331,565	331,704
Compared David and Dise	2004/05	324,120	321,339
Support Budget Plan	2005/06	332,223	334,343
Distribution of Expenditure Increases	2006/07	348,262	353,551
	2007/08	356,296	368,424
Sources of Revenue	2008/09	356,050	372,393
Revenue Foregone	2009/10	358,063	354,812
Uses of Revenue	2010/11	354,382	341,728
One-Time	2011/12	346,225	355,609
Augmentations	2012/13	345,289	358,794
Supplemental	2013/14	350,838	370,585
Documentation	2014/15	361,618	382,231
Home	2015/16 ³	375,080	
	2016/17 4	389,702	

Source: Chancellor's Office Website

CSU Faculty Hiring crises:

1. Current '15-'16 FTES 375,000 2. Projected '16-'17 FTES 390,000 3. Net Increase next year 15,000 4. Faculty for increase (23:1): 650 5. Faculty for attrition: 625 6. Total Faculty Hires needed 1275 7. Faculty hired (`15-'16): 750 8. Net Deficit in Faculty: -525

Historical Fiscal Deficit Solutions

- 1. Increase income (e.g. State, tuition, philanthropy)
- 2. Decrease expenses (e.g. SFR; salaries; impaction).
- 3. Better utilization of space (e.g. weekend classes)
- 4. Public-Private partnerships (e.g. the SJSC Library)

Each has limits. All are controversial. None work in the long run. Tuition has outpaced inflation 3:1; only 1:7 dollars are philanthropic; building space is finite; real faculty salaries are down 10%; most importantly the State is tying CSU budgets to 4yr and 6yr grad rates! (i.e. Student Success) Point #2 - Technology is becoming the Disruptive Innovation Solution

1. A Definition

2. Dynamics

Disruptive Innovation: A Definition

1. A term of art coined by Harvard Business Professor, Clayton Christensen, in 1997. Used to describes a process by which a product or service, starting as a simpler application, eventually takes over and / or redefines a market (e.g. Amazon/retailing).

2. More generally, however, it has come to mean any perspective, process or product not universality accepted, initially, but through a shift in social awareness and reliance, comes to replace well established practices and perspectives. Sociologists call this a "paradigm shift".

Dynamics of Disruptive Innovation

1. Typically a slow process as it involves changes in attitudes as well as behaviors. Typically takes a couple of generations to evolve, if at all. (e.g. the electric light, banking, the telephone and automobiles).

2. Needs significant drivers to be Disruptive (social, political and economic). First comes exposure, then adoption, and finally acceptance, but only after significant forces generates the perception of need (demand) leading to a source (supply).

The Second Dynamic - What Drives Disruptive Innovation in Higher Education?



What Drives the Political Side

- 1. The Current and Next Governor (looking for political solution to more for less)
- 2. The Department of Finance (looking for a performance based measures)
- 3. The Legislature (trying to accommodate need for affordability)
- 4. The BOT and Chancellor (walking the tightrope between politics and economics)

The Political Assumptions of Technology

- 1. It's cheaper (not without investment in infrastructure).
- 2. It's scalable (no, size does matter; so does access)
- 3. It's just as effective as FTF (ignores alt. learning styles)

Political Response – Examples

SB 520 Steinberg - 2013

Expanded the Donohoe Bill calling for the UC, CSU and CC to separately identify top 20 bottleneck classes and offer online versions through "Online Student Incentive Grant Program" and placed in the "California Virtual Campus"

Section 1(d): "...California's public institutions of higher education have a unique opportunity to meet critical demands for enrollment and reduce time-to-degree by providing students with access to high-quality, alternative, online pathways..."

Political Response (cont.)

AB 456, Patterson, as amended - 2015 Public postsecondary education: University of California: California State University: electronic textbooks.

"...This bill declares the intent of the Legislature to enact legislation that would *require* the California State University, and *request* the University of California, to offer discounted electronic textbook rentals to their students for....each textbook assigned in courses..." The First Dynamic of DT - Attitude Change Toward Technology

- 1. Computing (effective by 1950; but not universally available until late 1970's).
- 2. Networking (Internet in 1969, but not universally available until HTML and the WEB in mid 1990's)
- 3. Educational Software (primitive CAI in the 70's but not universally available until LMS in the later 1990's)

Findings of the Chronicle Study Providing evidence on Change in Attitude Toward Technology as a Disruptive Innovation

- Today's students are Digital Natives and are demanding services on campus matching those elsewhere.
- Twice as many librarians as administrators think OER is a positive
- "Place" is being substituted by "cloud"; majority say within 5-years
- Some 60% believe faculty are using technology to improve teaching and learning
- Majority of Librarians think hardcopy collections will disappear within five years.

Source: The Chronicle of Higher Education: October 2015

Point #3 - Unintended Consequences of Educational Technology and How to Monitor?

Unintended Consequences of Disruptive Innovation

- There is no necessary connection between the drivers of technology and the resulting need, as to the greater good
- Disruptive Innovation is largely irreversible.

If data based, DT typically generates progress. If based on Politics/Economics, it can lead to negative outcomes. For example, GM buying Red Car or fracking in oil drilling.

Examples of Technology Unintended Consequences

- 1. 3rd Party Consolidation issues (esp. LMS / E-texts / Apps)
- 2. Large scale cooperation issues (e.g. Calstate online)
- 3. Governmental control issues (net neutrality continues?)
- 4. Economic issues (e.g. charge to enroll in MOOCs)
- 5. Grad issues Degrees to Certificates (e.g. Extended Ed)
- 6. Prep for Online issues (e.g. pro vs. reactive learners)

Potential consequences: 1) further decrease in state support; 2) increased SFR; 3) greater use of non-tenured and part time faculty; 4) fewer counseling/mentoring hours; 5) decreased sense of community; 6) increase in incompletes and higher attrition

What Can We Do to Monitor Disruptive Innovation

- Avoid "group think". Evaluate all technology used in Higher Ed. Collect and use data to make informed decisions on and off campus. Politicians know little about technology. Investigate, define, evaluate, analyze and summarize for them as much as you.
- Don't invest in infrastructure until demand and supply align. Higher Ed budgets are zero-sum. For every \$6,000 spent on technology, 30 students must be added to a class or one less class is taught.
- Be a pedagogical leader, not a political follower. Understand the science of learning more than the science of technology. Apply liberally when appropriate, don't force it when it is not.

Thanks for Listening