The Case for Online College Education – a work in progress

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- To what extent can
  - Low-cost online education lead to desired careers?
  - Employers measure and trust viability of online applicants?
- Presently, free online education does not lead to certificates or degrees.
- But lower-cost online education or "hybrid" options is happening.
- University educators recognize that
  - Massive online education is the wave of the future
  - Online experience will enhance understanding of how people learn
  - Role of colleges and universities will be altered.

- Why have MIT and Harvard each invested $30M in online education?!
- Their return on investment must be
  - More than enhancing their reputations and attracting on-campus students.
  - By charging for completion certificates, student testing, and advertising on online.
  - With many more students, they could reap much greater revenues.
- Online institutions should not cheapen education.
- How can students/employers be convinced online is viable?

Summary of Current Status

Table 1. Authors' Assessment of Present Viability of Online Educational Options

| Scenario | Clientele | Purpose | Cost to Clientele | | | Savings to Participant | Credential | Cost to Provider | | | Present Assessment |
			Internet Equipage	Tuition	Loan			Web Site Offering	Facilitator	Other	
1	Anyone	Fun	Yes	No	N/A	N/A	None	Yes	Optional	None	**Blue**
2	Students	Career Learning	Yes	No	N/A	Time; Commuting	Credible Certificate	Yes	Teacher	Testing	**Purple**
3	Students	Career Learning	Yes	No	N/A	Time; Commuting	Degree	Yes	Professor	Examination	**Red**
4a	Students	Career Learning	Yes	Yes	No	Time; Commuting	Credible Certificate	Yes	Teacher	Testing	**Yellow**
4b	Students	Career Learning	Yes	Yes	Yes	Time; Commuting	Credible Certificate	Yes	Teacher	Testing	**Brown**
5a	Students	Career Learning	Yes	Yes	No	Time; Commuting	Degree	Yes	Professor	Examination	**Gray**
5b	Students	Career Learning	Yes	Yes	Yes	Time; Commuting	Degree	Yes	Professor	Examination	**Green**

Blue: Not only presently possible but ongoing and thriving.

Purple: Not presently possible and quite difficult to achieve, particularly with respect to establishing suitable testing and credible certificates.

Red: Not presently possible and even more difficult to achieve, particularly with respect to providing professors, examinations, and degrees.

Yellow: Presently possible depending on amount of tuition supporting testing and certifications but somewhat unlikely because of avoiding loans.

Brown: Presently possible depending on amount of tuition supporting testing and certifications.

Gray: Presently possible depending on amount of tuition supporting examination and degrees but somewhat unlikely because of avoiding loans.

Green: Presently possible depending on amount of tuition supporting examination and degrees.

Tier I Colleges/Universities Offering Courses

- Non-profit edX is most notable provider of free online learning.

- *MIT Technology Review* has great article on higher education and online learning.

- Elite institutions are backing online education. However, Coursera is major free online course provider.

- edX and Coursera courses cannot be taken for credit but certificate can be obtained for fee.

- Open source edX software is under development.

- edX has competition from for-profit Coursera and Udacity, providers funded by venture capitalists. Students can receive grades but not degree credit.

- Venture capitalists are investing to profit from student testing and certification services which is what some like Coursera are doing.

Table 2. Information Regarding Tier I Universities

Institution	Provider	Domain(s)	Credentials	Fees	Investment	Comment
MIT	edX	**Engineering**	No Credit	Free	$30M	Math; unk
Harvard	edX		No Credit	Free	$30M	math?; unk
Berkeley	edX/Coursera	**Engineering**/Liberal Arts	No Credit	Free	unk	math, computer science to public health to poetry?; unk
Georgetown	edX	Liberal Arts	No Credit	Free	unk	
U. Texas	edX	**Engineering**	No Credit	Free	unk	math?; unk
Stanford	edX/Coursera	**Engineering**	No Credit	Free	unk	math, computer science to public health to poetry?; unk
Cal Tech	unk	**Engineering**/Science	unk	unk	unk	unk
Oxford	unk	Liberal Arts	unk	unk	unk	unk
Princeton	Coursera	**Engineering**/Liberal Arts	unk	unk	unk	computer science to public health to poetry?; unk
Wellesley	edX	Liberal Arts	No Credit	Free	unk	unk
Penn	Coursera	**Engineering**/Liberal Arts	unk	unk	unk	computer science to public health to poetry?; unk
Michigan	Coursera	**Engineering**/Liberal Arts	unk	unk	unk	computer science to public health to poetry?; unk
Duke	Coursera	**Engineering**/Liberal Arts	unk	unk	unk	unk
J. Hopkins	Coursera	**Engineering**/Liberal Arts	unk	unk	unk	unk
U. Virginia	Coursera	**Engineering**/Liberal Arts	unk	unk	unk	unk

ASEE Annual Conference
22-27 June 2013 – Atlanta, GA

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Tier II Offerors

▸ Suffolk University (**does not cover engineering**) emphasizes online education.

▸ Stevens Institute of Technology (**covers engineering**) offers award-winning online education at same cost as on-campus classes.

▸ Web providers offer online education: American Public University (APU), Colorado Technical University (CTU), and Northcentral University.

▸ Kaplan University offers (**no engineering**) degrees (costs $22,000), certificates, and scholarships.

▸ Capella University offers (**no engineering**) degrees, certificates, and scholarships. Students must pay $5,000 per semester for online graduate programs.

Possible Abuses

▸ Western Oklahoma State [community] College purports to help local military members and athletes maintain their NCAA eligibility through online learning, claiming universities accept credits.

▸ Two-week (10 day) courses costing $400 each are offered.

▸ There are 30 online classes, e.g.,

  ▸ Microcomputer Applications

  ▸ Create PowerPoint Slides

  ▸ Bake a Cake (!)

▸ They tout each class as involving more work than standard 16-week college course.

▸ This was to become under investigation <u>by this college's accreditor</u>.

▸ Other small colleges are offering similar online short-courses.

Functionalities of Online Learning (1/2)

▸ Existing and potential features provided by online learning environments.

- Blogging
- Certification
- Competition
- Cross-cultural interactions
- Electronic attendance lists
- Electronic publishing
- Electronic searches
- Grading
- Live meetings
- Meeting agendas
- Monitoring
- Quizzes
- Security protection
- Training
- Video tutorials
- Virtual laboratories
- Voting

- Broadcasting
- Collaboration
- Cooperation
- Discussion forums
- Electronic mailing lists
- Electronic resources
- Examinations
- Interactive design
- Live presentations
- Meeting minutes
- Prerecorded presentations
- Reviews
- Teleconferencing
- Video streaming
- Virtual chat rooms
- Voice streaming
- What if scenarios

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Functionalities of Online Learning (2/2)

▸ Universities are implementing/considering online education options

▸ 1. **Asynchronous**: Pre-recorded lectures viewed/listened to by student anytime. Student answers questions. Faculty "teaches" from any Internet location. <u>Most used and easily implementable model</u>.

▸ 2. **Synchronous**: Real-time lectures accessed by all students participating, with real time interactions through blogging or Q&A. <u>Less popular model</u> as faculty must be available at specific times.

▸ 3. **Hybrids**: Combination of online and in-class learning. California State

▸ University have started offering classes on campus one given week

▸ and online the next week. Thus, two classes can share one

▸ classroom space. <u>May become most common model</u>.
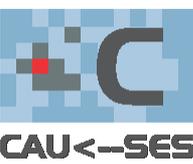
Advantages and Disadvantages of online education from a student's point-of-view (Table 3) (below). This could be viewed as a pair of lists that will evolve as we learn.

Advantage(s)	Disadvantage(s)
Free; relatively low-bar, if any, for admission	No credible credential
Credible Certificate	Some tuition required; must pass tests
Credits toward degree	More tuition required; must pass tests
Degree	Admission requirements; tuition required; must pass exams
Learn faster (at your best times and own speed)	May miss real-time interactions with others
Save college commuting time	Miss social aspects of college life
Greater authorities and experts are accessible	May miss out on works of on-campus professors or teachers
More topics, subjects, and resources (through Internet links) are available; more fun	Less in-depth concentration than a highly technical and focused class, e.g., laboratory course
More interactions with teachers or professors (depending on their dedication to online learning) and other students are possible than in-class	Teachers or professors may shirk duties most conducive to online learning. Participants determine what you contribute and how hard you work; miss much in-class experience
Opportunity for making international contacts and achieving collaborations (virtually)	Risk of missing valuable personal relationships potentially offered through in-class contacts
Draws on familiarity with social networks and adeptness with personal communication and gaming technologies	Is more difficult (e.g., need to be able to work independently; have good language, writing and fast typing skills and manage time effectively) and takes more time (typically 9-12 hours per week per course)
Can work from home; military personnel can still work on degree credits while continually relocating to their new assignments	Need web access and web site memberships; powerful computer processor, printer, scanner, video/graphics, software packages, cyber protections; and E-library access fees
Little or no loan debt upon completion of training (average college graduate's debt was $27,000 in 2011	Difficult to compete for jobs with college graduates, especially those taking jobs not requiring a degree
Greater potential for building career based on high-capability skills society demands	Relies on online education evolving in ways that can outstrip benefits of college education

- Online education will continue growing because online requires personal traits possessed by most students familiar with I-phones, texting, social networks, etc.

- Online courses generally demand more work – both for student and teacher.

- The Boston Globe showed and discussed, e.g.,

  - How graduates take menial jobs away from those not getting college degrees.

  - Whether online learners compete, even if they only get completion certificates?

- Federal subsidies to universities for loans may be counterproductive because this keeps students on campus who could gain more from online education.

- Online education could be more effective in creating job-qualified individuals; even compared to most who finish college.

- U.S. online education should be shaped in ways that will create more highly capable people with career abilities that cannot be duplicated by robots.

- Online education would then have great potential for closing the growing gap between haves and have-nots, even if low-skilled jobs disappear, and despite medium-skilled jobs being outsourced overseas.

Numbers of Online Students

▸ Even in 2012 online students numbered in the millions worldwide.
▸ Many courses attract tens to hundreds of thousands!
▸ Table 4 shows large online course offerors.

Online Offeror	Number of Enrollees	Comment
Coursera	1.5 million	
edX	155,000	Spring 2012 class only
Udacity	739,000	
Open Learning Initiative	51,000	
University of Phoenix	346,000	
The Open University	264,000	

▸ There were 6.1 million online students in 2010; this is expected to rise to 12 million by 2014 and to 22 million by 2017-18.

Innovation From Online Learning Environment

- Effectiveness of student online learning depends on the Internet facilitating interactions and access to information. Students want to see responses to their queries.
- Online learning is self-tailorable. Learning will result from or become
  - On-line video instruction
  - Less lecture
  - Homework oriented more to absorbing material
  - Learner focused
  - Real-time problem posing and solving
  - Discussion of case studies
  - In-class (online) homework
  - More interactive
  - Clicker-voting based with teacher oversight
  - Questions from students, i.e., "flipping the classroom".
- There is evidence that online education can do quite well in facilitating learning.
- Children can learn on their own because they "get" complexity at an early age. This affinity could lead to high effectiveness of online education, as well, for this younger generation.
- Netiquette, or Internet etiquette, are guidelines for posting and sending messages in the online classroom.
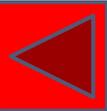
Legitimate Credentialing

- Free online courses cannot be taken for credit.
  - However, on edX a certificate of completion can be obtained for a modest fee.
  - With Coursera and Udacity students can receive grades but courses will not count toward a degree.
  - "Students press providers to offer degrees or other formal validation of the knowledge and skills they've acquired.
  - Still more external players may get involved in the credentialing process, such as state agencies or professional associations."
- Due to increasing demand and limited resources, certificates that are now free may not be so in future.
  - "[Berkeley] is considering whether to charge a small fee that could vary depending on students' means."

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‣ Researching this will be interesting to discover how

- ‣ Universities enhance their understanding of the ways people learn
- ‣ Students can be graded by more complex scoring techniques.

‣ Online will affect higher education, particularly at the graduate level.

- ‣ The California State University system is offering more graduate classes online and focusing on-campus learning on undergraduate education.
- ‣ The reverse could develop at other universities, i.e., students would learn some undergraduate material online, even in high school, so in-class venues would concentrate more on upper-class and graduate education.
- ‣ "The online courses may pose a serious challenge to the way institutions deliver a college education. … With millions of dollars in funding and the backing of some of the nation's elite institutions, [online courses are] forcing colleges and policymakers to rethink higher education. … [MOCCs] have changed the whole notion of college access and affordability. … [Additionally,] private testing firms to administer exams to large numbers of students [have starting springing up], [thus] detaching assessment from colleges and universities. Next, credentialing could also be separated from colleges as well … ."
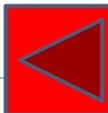
Conclusions and Future Work (1/2)

▸ Online education is still in its infancy.

▸ No free online courses lead to college degrees, nor college credit toward degrees, nor credible certificates of completion.

▸ However, there has been progress toward credible certificates of completion – or even degrees – if one pays some tuition and passes suitably proctored tests or examinations.

▸ We need to be gather more comprehensive data regarding cost scenarios.

▸ Online education will continue to blossom
  ▸ Many more can become trained for productive careers.
  ▸ Colleges and universities will be able to reap more revenue through economies of scale.

▸ More universities will adopt online education, especially for younger students.

▸ Research of issues affecting online education will increase.

▸ Online education course development will be enhanced through collaboration of subject matter experts.

▸ Jointly developed courses will give students different perspectives.

▸ Courses will be taught remotely, perhaps giving students access to more qualified faculty.

Conclusions and Future Work (2/2)

- We have only begun to present future online education prospects.
- Next we plan to research online education cost-benefit trade-offs for professors and teachers through a survey of faculty at various schools; we have excellent contacts at
    - California State University
    - Salem State University
    - MIT
    - Stevens Institute of Technology
    - U.S. Military Academy
    - University of North Texas
    - University of Adelaide
    - Baruch College of the City College of New York.
- We also want to cover the broad array of online-learning subject-domain programs.
- We will continue researching and analyzing available data of colleges and universities, as they revamp their online strategies, policies, practices, and operations.
- Online vs. in-class education will continue to coexist but hybrid combinations will continue to improve and ultimately thrive and emerge as the preferred choice.

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