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EBTM Project: e-Education

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I. Introduction

"Once we free ourselves from the mental limits of viewing this technology as a weak sister to face-to-face synchronous education, the potentials to revolutionize education and learning become readily apparent"

– Turrof, 1995

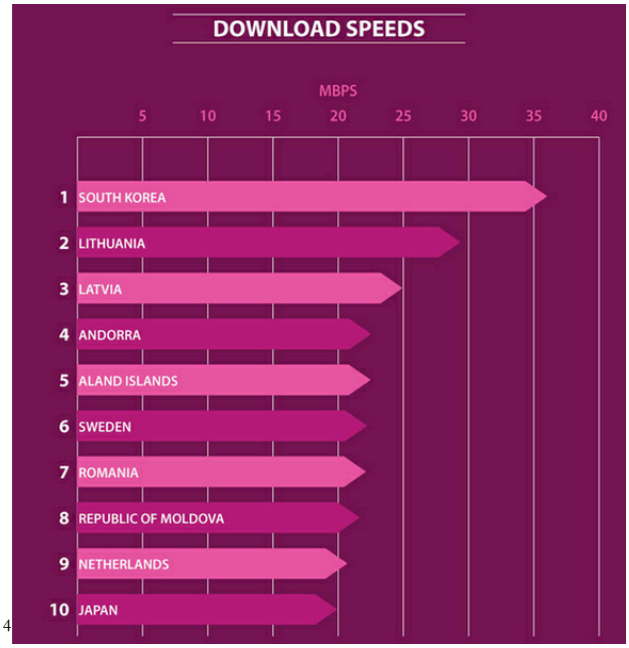
The dawn of the Internet age has brought with it a lot of changes as to how we live our lives. The delivery of education in particular has been greatly improved with technology. The emergence of multimedia applications has successfully aided the learning process for students. The traditional model of learning in classrooms remains to be the main form of delivery up to this day. However, this mode of learning is now being challenged with the birth of e-Education.

II. Technology

The internet technology has been growing really fast in the last decade.

A. Internet Speed

The current internet download speed in many countries has been very strong. Especially in leading countries like South Korea, the internet speed can go up to 35 MBps, while in most developed countries, their internet speeds are around 5-10 MBps. With this internet speed, you can download a high quality video with the length of 1 hour (300mb-700mb) from the internet within a couple of minutes. It also become viable for students and people in developing countries to access high quality and high speed internet at an affordable cost.[1][2]



[4] http://royal.pingdom.com/2010/11/12/real-connection-speeds-for-internet-users-across-the-world/

[2] Infographics above from - http://techcrunch.com/2011/03/30/the-history-of-internet-usage-and-speeds-infographic/

B. Cloud Computing

Cloud computing usage has increased and more companies are starting to adapt the Cloud Computing Strategy. The general price for cloud storage will go down and universities as well as e-Education platform can store more data on their cloud at a much cheaper price.

With the competition inside cloud movement, the quality and values that the cloud computing brings into any e-Education companies/platforms/universities are huge. It reduces cost, which the organization only needs to pay incrementally, saving their money. It also increase storage to a huge amount, and be more automated. Organizations do not need to spend their money on hiring IT staff to take care of their storage. They can focus on making better video and better education content.[3][4]

C. Video Streaming/Interactive Learning

Cheaper internet connection, more powerful servers and cloud computing technologies lead us to a new era of e-Education. When we mentioned about e-Education in the last few years, we were talking about downloading video/course materials and then studying from those. Students can choose to submit assignments. This is more aptly classified as e-Learning.

However, with the current Internet speed and server capacity, it now becomes more viable for organizations to think about interactive learning. Students can have the same schedule and come to the class the same time with the lecturer. Then, students can discuss together and discuss with other students online or ask lecturers any questions if they want.

D. Personal Computing Device

The era of personal computing desktop has passed, we are now moving into the new era, the era of mobile and tablet. Many tablets are now cheaper and stronger than a similar laptop. Becoming cheaper helps students to afford the tablet for studying. Kindle Fire - 149$, Google Nexus 199$, all are very cheap and can be used for basic purposes like web surfing, book reading, email checking and video watching. That's all a student needs.

The growth of the Apple iBook store and the Kindle Amazon has put down the prices for e-books and computing devices.

E. Self-authoring/teaching tools

The devices has changed the basic education needs and open for new demand from students in developing countries like India, Vietnam or African countries. If we look at the supply side of this education platform, we can see there are innovative projects going on as well. iBook Author, a new teaching tool of Apple, is one of them.

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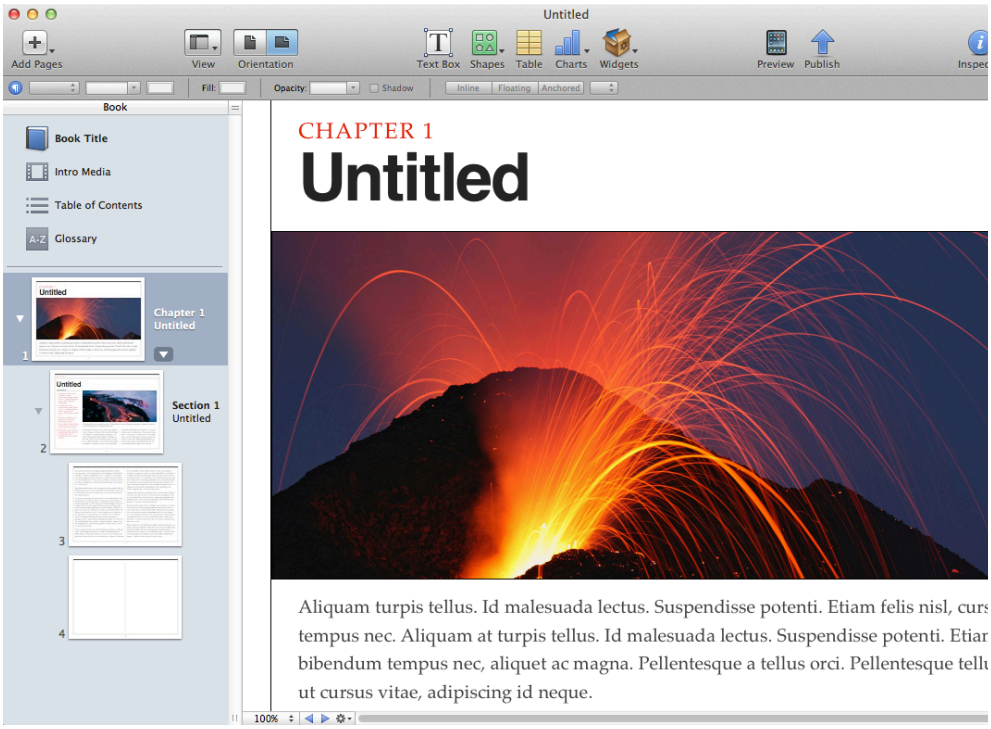
[3] http://www.slideshare.net/RevistaSG/cloud-computing-on-the-air-or-down-to-earth-beneficios-para-la-empresa

[4] http://web2.sys-con.com/node/640237

With iBooks Author, everybody can now create their own books with text, with images and other necessary animations.



From iBooks Author Mac App

This has become a powerful tool for book author, when they can create book more easily and publish the ebook themselves.

As analyzed by Klosowski (2012)[5], the iBooks Author tool provides many useful interactions that authors can build directly into their books. He analzyed that the main difference between having a text in an EPUB (the normal ebook format) file and iBook format is that iBook Author provides more interactive elements. There are three main features writers would likely to use:

- Photos, Audio and Video: these are key elements of any personal ebook. Writer can drag and drop these elements into the ebook without having much trouble.
- HTML Snippets: this html snippet is used to pull live content from the web, this content can be something changing, some new things that you want it to be updated regularly or keeping to be the latest version
- Keynote Presentations: you can import your presentations to become a slideshow in your own iBook and give it to everyone.

There are some successful stories with the new iBook Author since its release in January 2012[6].

[5] http://www.lifehacker.com.au/2012/01/how-to-design-your-own-book-with-ibooks-author/
[6] http://www.tuaw.com/2012/02/10/diesel-sweeties-turns-ibooks-author-experiment-into-successful-k/

Diesel Sweeties made his webcomic site into an ebook format inside the iBook Author and sell it inside the iBook Store. He reported that he sold around 10,000 copies in just the first 3 days. He then successfully raised 17,000$ to support his project in KickStarter.

III. The Evolution of e-Education

Education: Past, Present and Future.

A thorough analysis of e-Education should include a broader, anthropological framework of education itself. Furthermore, e-Education is part of a bigger trend involving many of the revolutions that are occurring in the transition from an industrial to an information economy. These include, but are not limited, to communications, health, the economy, media, energy and government. This section will analyze the evolution of education throughout the modern era and how recent technological, political, economical and social developments have generated an atmosphere ripe for disruption. Once these issues are addressed, we will explore the possibilities and future scenarios. Moreover, as e-Education becomes an integral part of education itself, it doesn't make sense to separate both in artificial sections, they belong to the same general trend.

A. Past

Pre-History, Antiquity and Middle Ages

Throughout 80% of modern human history (50 to 10 thousand years ago) cultural transmission was oral, thus limiting the extent of technological innovation between generations. With limited specialization, most of a society's knowledge could be transmitted from parents to children or, at most, anyone within a nomadic tribe of a few of hundred people.

The agricultural revolution (10 thousand years ago) allowed societies to store grain for the first time in history. This generated a dramatic explosion in settlement sizes, augmented specialization, complexified social structure, introduced concepts such as inequality and wealth, and created the necessity for written language. As these early societies developed, knowledge could now be transmitted via written language and wealth inequality meant that tutors could be employed to educate the privileged elite. In addition, the first libraries appeared in early civilizations such as Babylonia. Thus, as early as 3000 bc, some of the components familiar in modern education were present. Nonetheless, society remained in its most part illiterate, relying on the transmissions of skills form parents to children or at most by specialized guilds.

By late Antiquity formal education and literacy were pervasive. Public schools appeared as early as the 5th century BC in Ancient Greece and in 4th century BC in Rome, as the plebeians increased in wealth and power. The term "Academy" stems from Plato's first school of philosophy at "Akademia" in 385 BC. The culprit of Ancient Antiquity's education system was the library of

Alexandria two thousand years ago, a beacon of thought and inquiry, having at its height 30,000 works in 400,000 papyrus scrolls. Around this same time Ancient Roman society could be considered mostly literate (although not by today's standard, it is probable that they shared similar literacy rates as European societies in the late middle-ages).

With the fall of the Roman Empire in ad 476, European education decayed and remained mostly in hands of the Church monasteries, while the world of Islam kept and developed on the Ancient Greek and Roman texts. The first Universities with a guild structure appeared in Bologna (1088), Paris (1150) and Oxford (1167). Their traditions and practices remain with us till these days.

Renaissance and Pre-Industrial Era

It would not be until the Renaissance in the city-states of Venice and Florence that society would regain its Ancient level of knowledge. As political institutions changed from inclusive to extractive in the 16th century, its spirit dwindled in Italy, but spread and augmented in Western Europe, where the black death had dissolved feudal institutions, thus allowing increased liberty and migration to cities such as Paris, London and Amsterdam. After the invention of the printing press in 1439, literacy rocketed throughout Western Europe. Major innovations in scientific thought after this point would be just a matter of time and would fuel the Industrial Revolution in the coming centuries. The arts would also flourish. London, in the 16th century saw an incredible burst in genius in a single generation, as Shakespeare, Marlow and other talented people, mingled in a new atmosphere of political and religious freedom. This was possible due to a sudden increase in access to formal education, as sons of middle-class parents were given access to grammar schools and could eventually attend universities. Additionally, the Reformation encouraged literacy, facilitating thus a sudden burst in literacy from 1 percent in 1510 to 50 percent by the time Shakespeare was moving to the English capital. The following images show the spread of the printing press in Europe during the 15th century.

By the early 16th century most of the components found in modern day universities were present. Needless to say, although literacy was becoming pervasive, University was a privilege reserved for the wealthy elite, a fact that is still common today in much parts of the world. Middle-class children during the Renaissance received elementary education while children of the nobility and upper classes attended humanist secondary schools and universities. The majority of the population was still illiterate (numbers varied between different European nations, but such figures probably varied between 50 and 70 percent).

Industrial Era

After the Glorious Revolution of 1688, by creating a framework of inclusive institutions and political balance based on a powerful merchant class, England had set the stage for the Industrial Revolution. The following three centuries would see the world, particularly in Western Europe; change from an agrarian to an industrial society. As these changes took place the need for an

educated workforce became apparent. During the late 19th century England passed the Elementary Education Act of 1870 and made elementary public schools compulsory while France followed in 1880 with the creation of the Republican School. However, by this point, most adult population in Western Europe was literate, as can be seen by the evolution of French illiteracy rates.

By the end of the 19th century, a modern education system was in place: kids would be segmented according to age, vacations would take place during the harvest in summer and students would move in batch, one year at a time, till graduation. Many of these ideas were conceived at the height of the industrial era and were quite progressive for their time. During the 20th century compulsory secondary education was introduced in much of the western world, but the basic philosophy wouldn't change: students would be imparted knowledge using a top-down approach and, by the time of graduation, they would have the basic requirements to lead a productive life in society. Most middle-class families would send their kids to high school or, at most, Public Universities, while the elites would send their kids to Ivy League Universities. This system made total sense for an Industrial Economy and prospered for more than a century. It is highly classist and treats education just as any other industrial process, were students move from Kindergarten to Elementary School, form Elementary to High School, from High School to College and from College to Graduate School. At each step some selection takes place, offering the smarter and wealthier a higher stake of society's wealth.

B. Present

As many other 20th century institutions, Higher Education, particularly in the US is showing many sings of exhaustion. It is a model designed for an Industrial Era, not for the Information Age. Many of its practices can be traced back to Antiquity, without any major innovation in the educational system itself. Today as more than two millennia ago, students gather in a class and listen to the teacher's lecture. Many institutions, due to cost or plain tradition, still don't rely on the book, a 15th century technology, as the main medium through which to transmit knowledge. In some Machiavellic sense, the exclusiveness of such institutions is not a coincidence, since modern elite's economic and political power stem mainly from their privileged access to knowledge and social networks provided by Ivy League Schools. It is a system that ensures the continuity of the economic and political power of a limited elite. Under such circumstances there is little incentive to change the system, while middle-class families incur in chronic debt just to keep up. It is an inefficient system that, by excluding the vast majority of its citizens from access to high quality education, drains most of the country's economic potential.

In addition, primary and secondary education, as well as most higher education institutions, discourages any form of creativity and independent thought. While sitting to lectures, memorizing material and taking tests could have been enough in the past; this system is dampening the world's creative potential. Today, were we have the internet at the tip of our fingers, it is more important to know how to apply knowledge in new creative forms rather than to simply know something. The education system should reflect this new reality and prepare young people for the creative economy that will flourish in coming years. Furthermore, there is no logical reason why kids should be

segmented according to age rather than skill or talent. Many charter and artistic oriented schools are starting to relax many of these assumptions and showing amazing results. While the current education system is preparing millions of young people for a bureaucratic job, something that could have been desirable in the 1950's, it is not taking advantage of the economy's most valuable resource: talent. It focuses on average results and "good enough" philosophy rather than encourage excellence. While London in the late 16th century, a city with a population of 200,000, of which half were illiterate, produced literary geniuses such as William Shakespeare and Florence, in the late 15th century, a town with 50,00 people, saw a creative explosion with Da Vinci, Michelangelo, Botticelli, Ghiberti and Donatello, the question is then: were are have all the geniuses gone? Probably boring themselves in class, not being able to pay a decent college and ending up in some middle-income job. Many of the skills that don't require a formal system of education and are not taught at school, such as rock and coding skills, are some of the exceptions. (to be fair, most of the scientific and artistic breakthroughs in the last centuries were possible thanks to this educational system, but we argue that it is still at the cost of many others that never had the chance to flourish).

Today, as the Internet matured in the last 20 years, high quality lectures have become accessible to anyone with access to broadband connection and may trigger a revolution in the coming years. Organizations such as Khan Academy, Udemy, Udacity, EdX and Coursera are leading the revolution in an industry that has been stagnant for decades. As governments, companies and people start to see the value in such proposition, pressure will build up to change the current outdated education system. These changes won't come alone, and will create further pressure in governments, corporations and the economy.

C. Future

"Prediction is very difficult, especially about the future". Niels Bohr.

While it is very difficult predicting in detail how will the changes in education unravel in the next decades, by seeing the general historic and anthropological trend, we can try to predict many of the characteristic of an information age schooling that prepares young people for the creative economy. Kevin Kelly, author of "What Technology Wants" argues that the evolution of technology (of which education is part) has a direction that follows certain characteristics:

- The varieties of whatever will increase. Those varieties that give humans more free choices will prevail.
- Technologies will start out general in their first version, and specialize over time. Going niche will always be going with the flow. There is almost no end to how specialized (and tiny) some niches can get.
- You can safely anticipate higher energy efficiency, more compact meaning and everything getting smarter.
- All are headed to ubiquity and free. What flips when everyone has one? What happens when it is free?

- Over time the fastest moving technology will become more social, more co-dependent, more ecological, more deeply entwined with other technologies. Many technologies require scaffolding tech to be born first.
- The trend is toward enabling technologies which become tools for inventing new technologies easiest, faster, cheaper.

From these concepts and the general historic trend we can expect the following:

Education will be universal.

Anyone with access to the internet, which in the next decades will be the entire human population, will have access to high quality education. Today, cellular technology exists in rural Africa, it is not hard to imagine that in the next decades everyone will have access to the internet.

Education will be free.

Although certain "fermium" products may emerge, education will remain mostly free, open to anyone with the desire to learn. This in turn, will free huge economic stocks of wealth, as people, especially in the west, need no longer to save a great percentage of their income in education.

Education will evolve.

Empirical studies are possible for the first time, thus allowing the optimization of educational techniques. This allows for a rapid evolution of its method, as new improvements are iterated on a weekly basis. The rapid changes brought by this revolution will probably do a lot of "creative destruction". Many Universities will adapt, but many won't (Carnegie Mellon is moving slowly in this area).

Education will diversify.

Education today is highly centralized and there are not many "varieties". Although there have been slight variations of the same system, there has not been room for innovation and experimentation. There won't be one education system, but rather a growing global ecosystem of educational systems, which compete and cooperate with each other. Technology will represent just one component of this mix. Education will be provided as a mixture between Government, NGO's and Corporations.

Education will become "smart".

Education will merge with the current smart trend in systems. It will be highly reactive, trying to achieve balance with its environment, which comprises global population and the economy at large. Talent will be easily detected and even predicted. Future needs in certain specialties will be transmitted into the system, relying heavily on machine learning such as modern technology companies.

Education will be social.

A global network of specialties and talents will naturally emerge. It will also optimize local talent networks in such a way that creativity flourishes in any environment. Additionally, it will favor human social welfare, encouraging happiness, development and family life.

Education will be ubiquitous.
There won't be a particular place or time where education takes place. Education will happen everywhere and at anytime, it will merge with our daily activities. This will be true for adults and children as well. The same will be true for professors, as their lectures are recorded.

Education will specialize.
Education, in addition to being universal, it will allow any talent to flourish, be it artistic, scientific. There will be no "weird" subject, as long as anyone is willing to pursue it. From cooking, to meditation, to physics, there will be specialized niches.

Education will merge with technology.
There isn't such a thing as e-Education and normal Education. Education will merge with the current technology and will exist in any sort of device. Any gain in information technologies will favor further development in education and vice versa.

Needless to say, Khan Academy, Coursera and many of the new education organizations fit right into many these trends, but it is just the beginning of a revolution. What are the consequences that this trends will bring? What will happen when most of the adult population has had access to high quality education? For starters, as a new generation grows with access to knowledge, which implies greater freedom and economic power, they will demand changes that adapt to their needs. These will include reforms that favor inclusive economic and political institutions. Additionally, they will be highly entrepreneurial, creative and will demand an adequate environment in which to develop.

Talent will be detected before it actually occurs, as billions of people enter the system, anyone with unique capabilities will stand out. This will represent a huge market, as companies try to engineer creative atmospheres within their offices. Also, as projects become more important as a means of education, a wiki DIY culture will emerge, in which business and education converge. People from any background will be able to contribute to any project, be it educational or professional. Organizations, government and education will share this porous culture.

As this wiki culture becomes dominant, government, as we know it today will have to move in the same direction. People won't be satisfied with bureaucratic, inefficient, top-down solutions to their everyday problems. Early precursors to these trends are Government's open data initiatives together with hackathons. Many governments, especially those with a extractive institutions and centralized power, will try to resist this trend and try to avoid this empowerment of the masses, but will eventually fail, as the ones who do will thrive economically and socially. These changes won't come without a struggle. Eventually, governments and organizations will mutate into a more distributed, inclusive, efficient and porous structures.

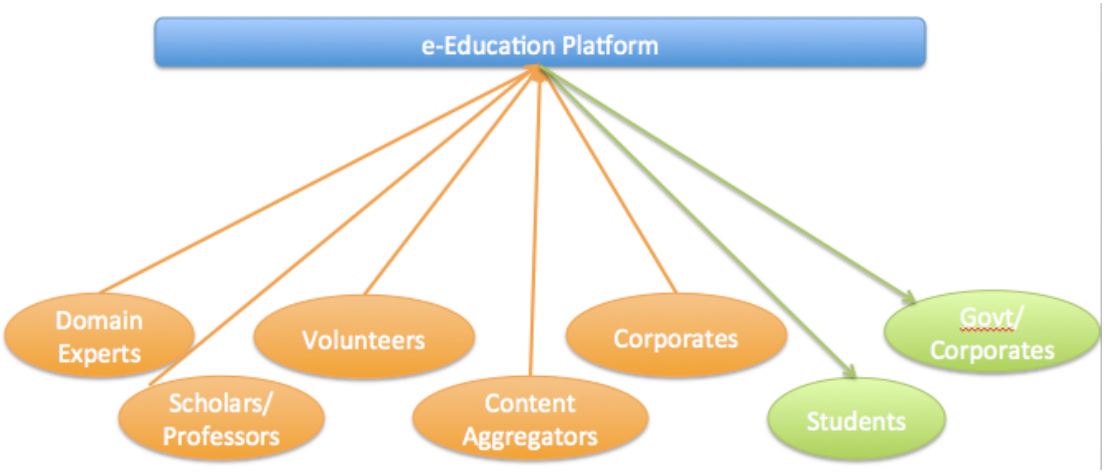
The printing press increased access to education in the 16th century; this access changed the economic and power structures of society and this new political structure created an environment even more propitious for human development. Those, such as England and Holland, who allowed

this dynamic to take shape thrived and this who didn't, such as Spain and Russia, eventually collapsed. Today, the Internet will democratize higher quality education, which will give greater economic and political power to talented, low-income people, and this empowerment will further revolutionize their own societies. The Arab Spring was just an example of this new generation, with access to education that demands inclusive governments.

Furthermore, these new forms of education will increase collaboration and cross-dissemination of cultures and ideas, further increasing the creative output of the global society. Technology is changing education; education will change society's structure, which in turn will create pressure for changes in power, allowing further changes in each of these areas. It is a virtuous cycle that will define the coming decades. Governments are starting to feel the pressure from unemployment and lack of capital, so there is pressure for these changes to occur. Many of today's global challenges need these changes in order to be solved. As education changes, power will move from the west to the east, and from corporations to people. We will probably see many new Da Vincis and Einsteins appear in remote African, Indian and Chinese villages or cities. As this happens we might enter a new Renaissance and period of global abundance. It is probable that people in the future will be shocked of our current educational system in the same way that we may be shocked that only 1% of people were literate five hundred years ago.

IV. Business

A. e-Education PLATFORM



Supply Side

Domain experts in skill areas such as photography, videography, web design, programming etc can develop the video course work and publish it on their websites are on e-Education portals. Most of these instructors have vast industry experience and are usually certified to teach.

Many scholars and professors from various world-class universities have been putting up their class lectures and/or recorded video sessions online. It started with YouTube videos and has n[6]ow developed into dedicated websites. Universities started opening up their course contents in the last 3-5 years. But off lately, professors have made efforts to publish their individual work outside of university portals.

Salman Khan, founder of 'Khan Academy' has single handily recorded hundreds of videos on topic ranging from basic mathematics to economic theories. Now, the site is open for volunteers to upload their work. Volunteers are also taking great effort in translating the content into different languages.

Many websites have come up in last 2 years that work as content aggregators by clubbing the instructors of various topics or by providing a catalog based access to freely available courses. These portals also add value by creating forums, developing additional materials and by providing customer support services.

Corporate houses such as 'Investopedia'[7] have developed interesting video contents in the finance area to educate the public. This activity is more of a brand building activity for these corporate houses. Usually these are distributed through free video sites such as Youtube/Vimeo.

Demand Side

'Students' is a general category, which could include anyone with a desire/need to learn. In case of school students, they would access Khan Academy primarily to supplement the school learning. For a college student it could be either supplementary or additional resource. For working individual resources on Lynda.com, udemy.com etc are training resources.

Corporate and Government bodies have regular needs for corporate wide trainings. Many of these portals have specifically crafted deals for such large customers.

Stakeholders

Apart from the entities identified above, there is section of business entities that would be affected (either positively or negatively) by e-Education business.

Universities and Professors who haven't joined the stream of e-Education are starting to find the need to modify the curriculum/teaching methodology so as to keep the attention of their students who are exposed to these e-Education services.

[7] www.investopedia.com

Most of the study materials relevant to the video lectures are made available as part of pay subscriptions. The dependency on textbooks, hand guides are starting to decline. However market should consolidate in near future.

Thus authors and publishers are forced to adapt the digital content-based products and services. Developing countries have a flourishing business of training academies that train students on skills such as web design, animation, programming, networking etc. With an easy and affordable access to online content, students and recent graduates are more likely to sign up for online portals than registering for the traditional academies. Therefore, training academies might have to factor in the raise of e-Education in their business strategy.

Companies and other certifying entities might need to start accepting the e-Education as part of required classroom session hours for approving the candidate. For example, videography software tutorial for 'Finalcut Pro' could add upto credits for Apple certification. As of date, the acceptance is low but it is bound to open up.

As the industry matures, even Government bodies should open up the candidature from applicants who have completed the e-Education course materials. The application should be treated on par with the application from a candidate who has gone through traditional training system.

B. Business and Pricing Models

e-Education businesses can be broadly classified into categories:

i. Paid subscriptions:

These websites charge fee for accessing the contents. The fee varies in amount, frequency of payment and access granted. Two of the distinct models in paid subscriptions are:

a. Subscription for the entire site content:

This payment type opens up all the contents on the web portal. Different sub-categories could be available that has varied access level and varied subscription periods.

b. Subscription based on course materials:

This payment type provides access to only the content purchased. For example, a course of appsumo.com comes with its own price tag [say $20]. By paying $20, user gets access to only that particular course work.

ii. Open and Free:

These web portals operate on the lines of Open and Free software philosophy. The classical example of this model is 'Khan Academy'. The contents are distributed under CC – Creative Commons license. Few talented individuals, professors contribute towards building the contents for their open coursework, while Khan Academy has started to accept contents from volunteers too.

C. e-Education Issues

Although e-Education is an upcoming and interesting channel for future education, it is going to meet with certain obstacles. The possible issues could be categorized based on the business/pricing models discussed earlier.

Paid-Subscription Model: Issues

e-Education portals have been experimenting with different pricing models and price levels for the last 3-5 years. None of the businesses are public companies to analyze the financials, however the variations in the price, value for money and course quality provides an indication that these businesses are trying to find a foothold in this upcoming field. Therefore long term profitability of operations is an on-going experiment.

Scalability could be an issue that needs attention. The large web portals are advertising of the fact that they have repository of 2000-3000 videos. Unless a strategic decision is made to focus on the field of expertise, it would be a difficult path for the e-Education business to scale up in a given time frame. Also, with the ever-increasing competition in the area, scalability would be the differentiating factor.

As with a traditional setup, credibility of the coursework determines the success. Word-of-mouth marketing would be an ideal choice to build the credibility. But the business has to put in efforts to tie up with the associated entities to certify its courses. Testimonials from the corporate clients, efficient refunding policies could go a long way in building the trust.

By design, these portals are made for global audience. However, as they venture into specific courses that might be designed for schools students, they would have to start focusing on

customizations – content and language specific. This would be a huge effort and companies need to make strategic decisions, else they would be over run by local ventures.

Open & Free model: Issues

These portals are run by Universities or Professors who are supported by universities [with the exception of Khan Academy], which puts them at the risk of dedication and continuity. Unless the idea of open education picks up to a critical mass, the model could die down. However, Khan Academy seems to have reached the critical mass in turns of the support structure and continues to grow. Philanthropic funds could be a possible solution to solve the sustainability issues.

There have been instances when a particular university is not receptive of Open education while the Professor of the University could publish video lectures on his own capacity. This could lead to conflict of interest. The legal framework needs to be worked out to solve such tricky situations.

Credibility is much more of an issue for open e-Education portals as the certification and marketing processes would involve money and business acumen. Compared to paid subscription services, open & free services could take longer time to gain the confidence of certifying authorities and corporates.

D. Marketing and Advertising

e-Education portals have followed the traditional marketing channels for an online business. Banner Ads, affiliate programs, Google AdWords are some of the traditional marketing channels that are helping the e-Education portals reach out to global audience. Facebook Ads and sponsored twitters have been adapted by few of these portals to advertise to specific regions of its customer base. Professional skill training websites prefer LinkedIn advertising to reach out the corporate clients.

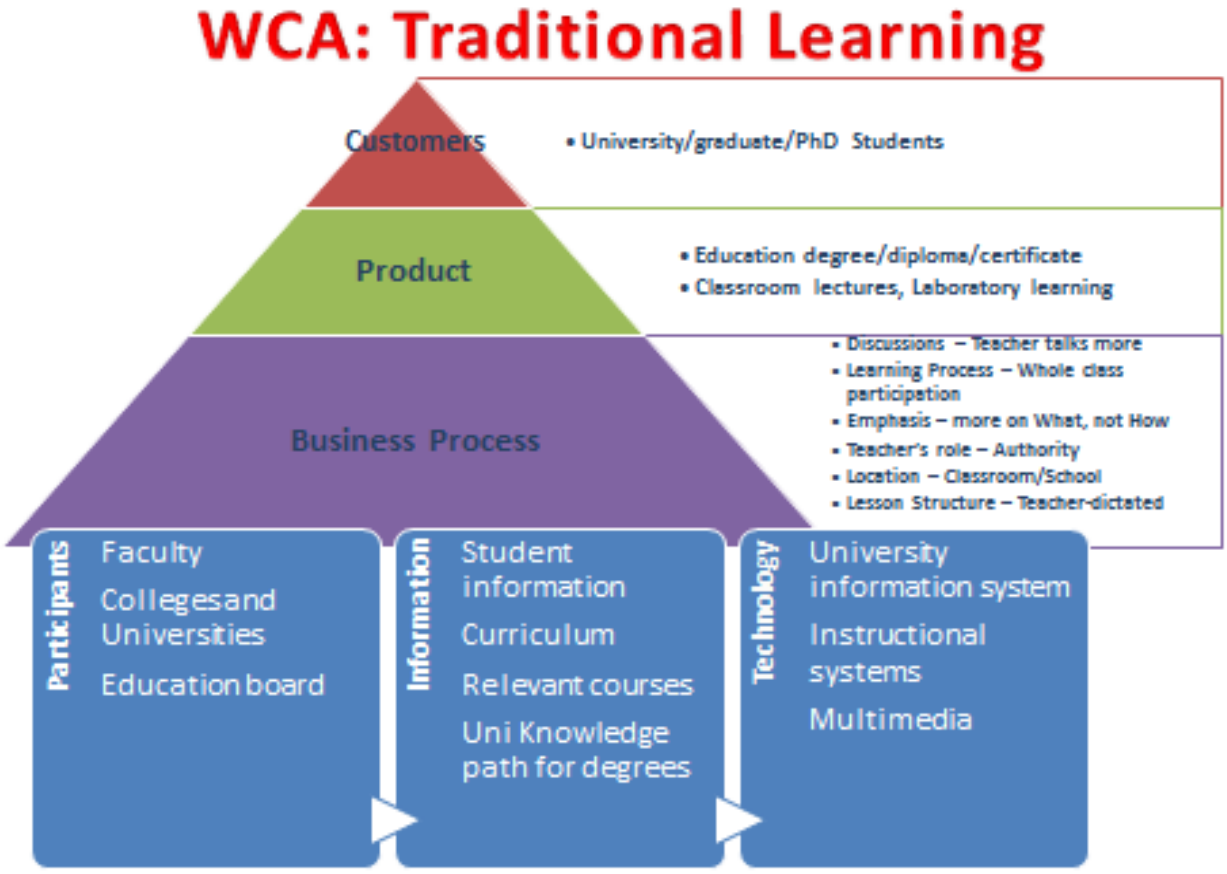
Websites such as Lynda.com have established partnerships with universities [including CMU] where in the students get free access to the entire contents while the university pays in bulk. These model helps the web portals reach out to potential end users, who might get converted to paid users beyond their university time period.

Institutional customers could be the large group of customers for these portals in future. Marketing campaigns and dedicated sales force could be the way forward for these portals to reach the target audience.

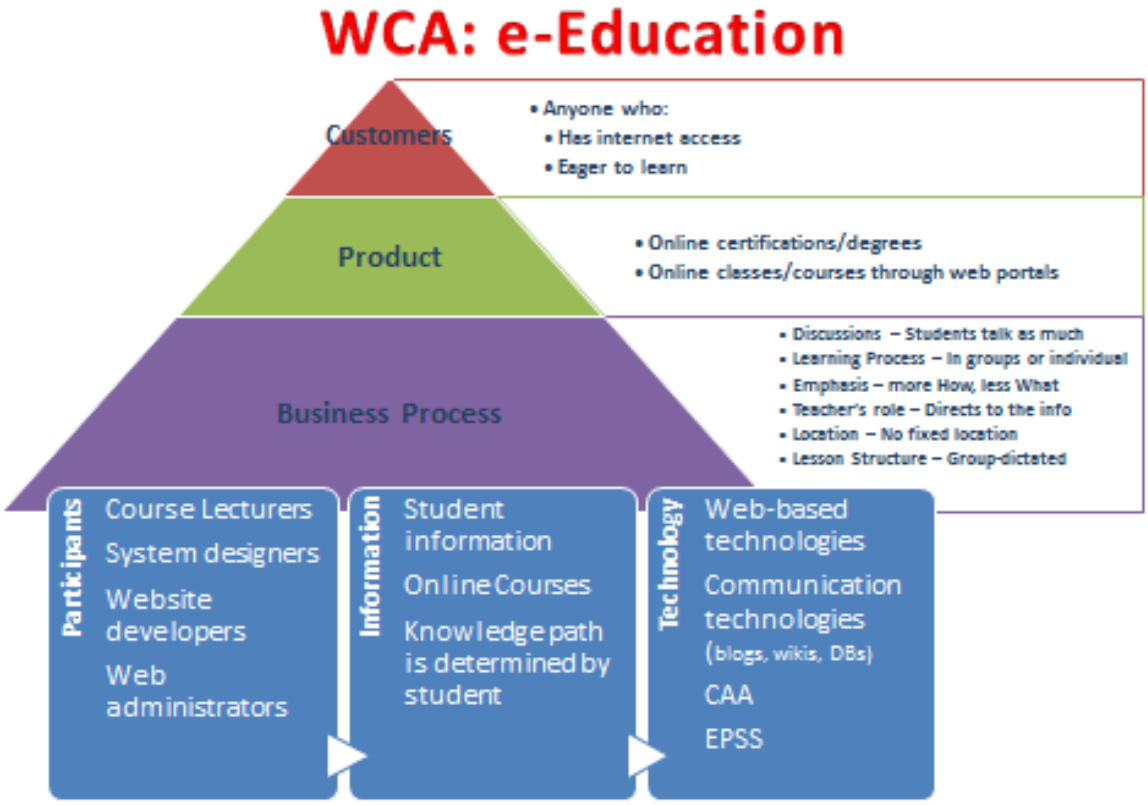
E. Work-centered Analysis: A Comparison

With traditional learning, only those who can afford to pay education fees and/or are smart enough to earn scholarships do learn from reputable institutions of education. As such, the customer base is limited. However, with e-Education gaining ground as an alternative way of learning, the market base of education would be just about anyone who has internet access and has the eagerness to learn. This makes education available to a much larger customer base that the internet reaches. It could set the pace for an educational revolution that could create a number of significant impacts globally in the field of science, finance and economics.

WCA: Traditional Model



WCA: e-Education



F. The Impact of the New Model on the Old

The figure below discusses the main differences between the traditional mode of learning vs e-Learning (in the context of e-Education)(Table below).[8] It is showing how the online education is changing the different aspects of the traditional way of learning.

[8] http://net.educause.edu/ir/library/pdf/ffp0101s.pdf

The following table summarizes several opinions regarding the comparison between traditional learning and eLearning:

	Traditional Learning	eLearning
Classroom Discussions	The teacher usually talks more than the student	The student talks at least as much as or more than the teacher
Learning Process	The learning is conducted with the whole class participating; there is almost no group or individual study	Most of the learning process takes place in groups or by the individual student.
Subject Matter	The teacher conducts the lesson according to the study program and the existing curriculum	The student participates in determining the subject matter; the studying is based on various sources of information, including web data banks and net-experts located by the student.
Emphases in the Learning Process	The students learn "what" and not "how"; the students and the teachers are busy completing the required subject matter quota; the students are not involved in inquiry-based education and in solving problems, but rather in tasks set by the teacher.	The students learn "how" and less "what"; the learning includes research study which combines searching for and collecting information from web data banks and authorities on the communications network; the learning is better connected to the real world, the subject matter is richer and includes material in different formats.
Motivation	The students' motivation is low, and the subject matter is "distant" from them.	The students' motivation is high due to the involvement in matters that are closer to them and to the use of technology.
Teacher's Role	The teacher is the authority	The teacher directs the student to the information.
Location of Learning	The learning takes place within the classroom and the school	The learning takes place with no fixed location
Lesson Structure	The teacher dictates the structure of the lesson and the division of time	The structure of the lesson is affected by the group dynamics.

G. e-Education : A Porter's Five Forces Analysis

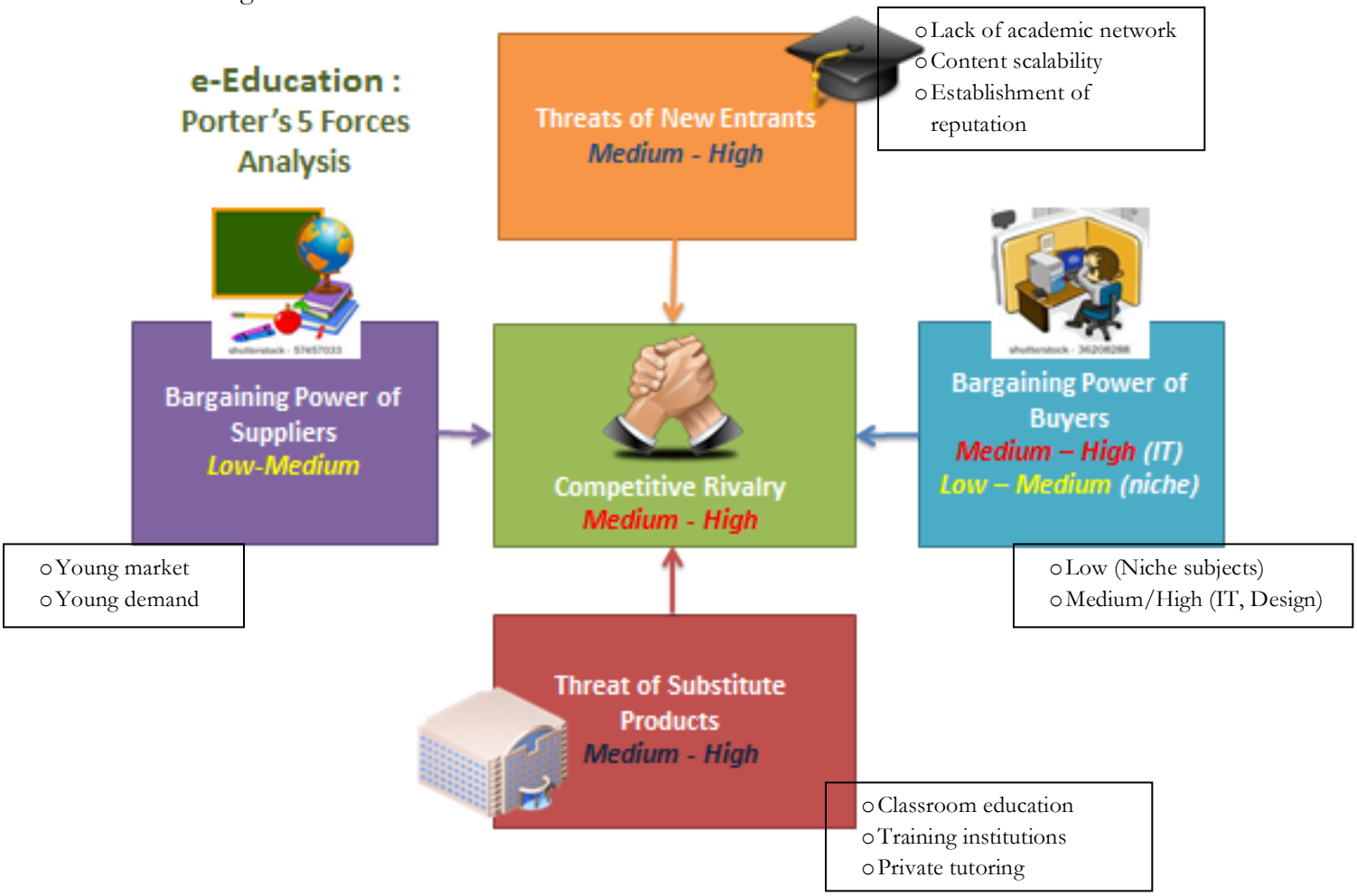
Threat of New Entrants

New entrants to the market of e-Education will most likely face the following challenges:

1. Lack of academic network
   Academic network will give them the authenticity that will attract more customers.
2. Content scalability

High scalability would be needed as the demand increases. Sourcing quality content would also be a continuing challenge.

3. Establishment of reputation
   Existing pioneer e-Education players would have established their own reputations as online learning institutions. It will take time for e-Education players to build their own good name.



Threat of Substitute Products

e-Education's major substitute product is the traditional mode of learning from brick and mortar universities. These institutions have long established their reputations as providers of quality education. The prestige and recognition of universities worldwide is a big challenge for e-Education to overcome.

They offer education delivery in the following forms:

1. Classroom education
2. Training institutions
3. Private tutoring

Bargaining power of Suppliers

- Low to Medium bargaining power

The market is still in its early growth stage. Many initiatives of similar start-ups have already surfaced since yet the market is still taking time to mature. As such, demand is not very strong yet, diminishing the bargaining power of suppliers.

Bargaining Power of Buyers

- Medium - High bargaining power (IT-related courses, Design courses)

At the moment, most courses offered have something to do with IT-related courses as well as graphics and design courses. The power of the consumers rests in the fact that many suppliers are competing for their patronage.

- Low – (Niche subject matters)

For subject matters not usually offered online such as economics, accounting, finance, telecommunications, etc., bargaining power is low as buyers would have to resort to the services of the few who offer them.

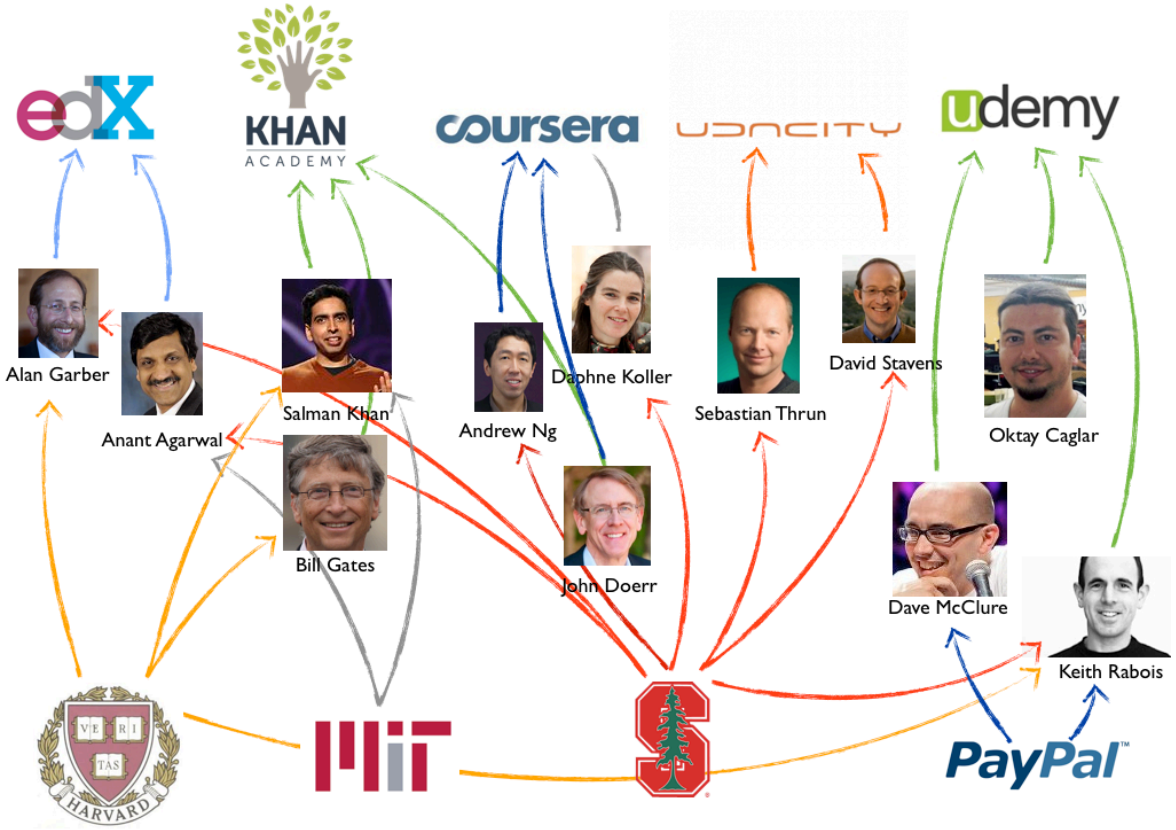
Competitive Rivalry

- Medium to High Competitive environment

Overall we see the e-Education market as having a medium to high competitive environment because of the race to get ahead in the growing market that holds much potential for great returns, not only financially, but in terms of its global impact.

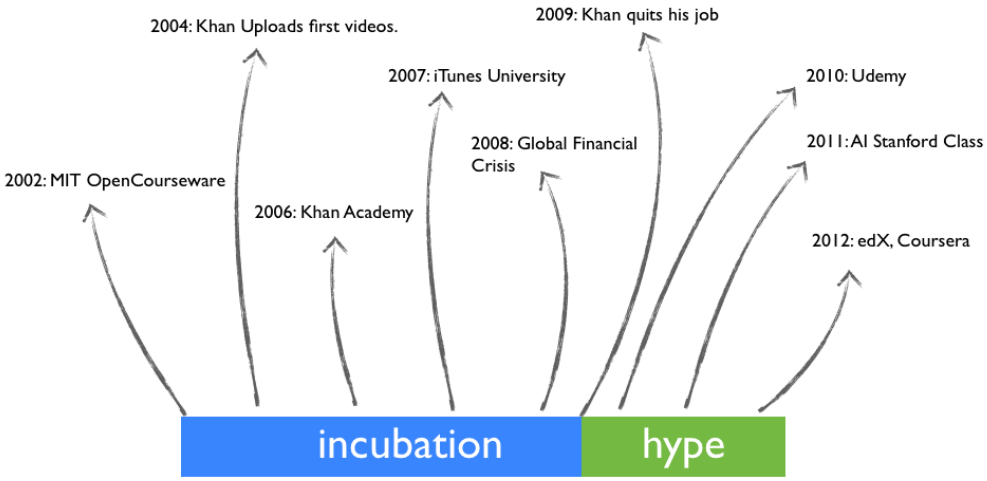
V. Market Landscape

This section will analyze the current market landscape of new e-Education platforms that emerged in the last years. We will focus our analysis on Khan Academy, Coursera, Udemy, Udacity and EdX. The study will focus not only on the companies, but on the people driving the current revolution, as well as the VC firms backing each of these ventures. It is a highly connected landscape, which is moving at a very fast pace.



Main players in the e-Education market landscape.

A. Timeline



Main events in the evolution of e-Education.

Taking a close look at the evolution of the market, one can say it started moving as soon as technology allowed it. While in 2012 we may be already used to YouTube, Facebook and Twitter, we must remember that in 2004 Mark Zuckerberg was just a Harvard undergrad, a tweet was something a bird would do and YouTube was a start-up by three PayPal employees.

In 2002 e-Education became a reality as MIT Opencourseware launched offering 32 courses. By 2004, Khan was uploading his first videos, still not knowing he would unleash a revolution. In 2007 Apple launched iTunes University, using its platform to offer free courses, together with pdf and other documents. It can be said that these were the early precursors of today's revolution. As Khan iterated on his product and included real interaction it can be said that modern e-Education appeared. However, this wouldn't happen till 2009, when Khan quit his job as a hedge fund analyst. It must be noted that this model emerged by luck (albeit afterward it was perfected) rather than created by a top down approach, such as MIT OpenCourseware or iTunes University. As soon Khan had Khan Academy on the web it was a matter of time till his model would be adopted in Higher Education. Why it didn't happen before? Probably it was an idea that was maturing as these precursors were around. During this same period social networks such as Facebook and Twitter exploded and YouTube was aquired by Google for $1.65 Billion. In 2006, the person of the year in the cover of time was "you", in reference to the web became a medium through which to generate material. After the Global Financial Crisis in 2008, the pressure to solve higher education became bigger. Furthermore, as the perils of greed in Wall Street became clear, Khan's decision to quit his job as a hedge fund analyst became easier. By 2010 Khan was in close contact with John Doerr, Bill Gates and receiving considerable funding. Khan started appearing in the news and started getting a lot of attention. The next higher education site to appear was Udemy in 2010. In 2011 Stanford opened its AI class to the world and received 100,000 students. This hit encouraged the creation of Udacity in 2011, Coursera in early 2012 and edX in late 2012.

B. Landscape

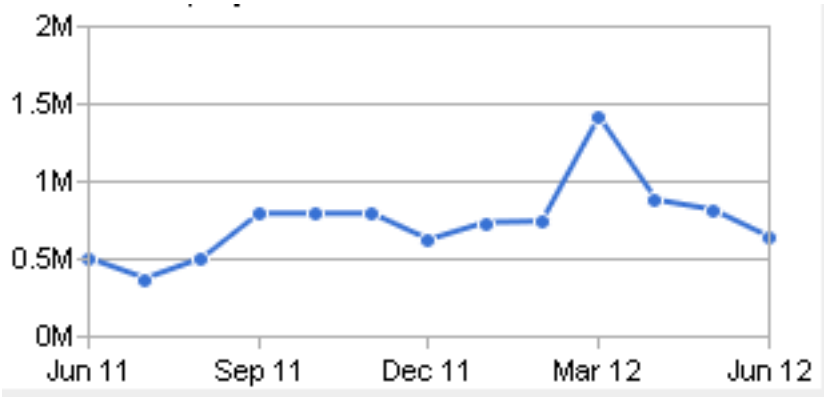
Khan Academy

Description

The origins of Khan Academy go back to 2004, when Salman Khan began tutoring her cousin in mathematics using Yahoo!'s Doodle notepad. As more people seeked help, Khan decided it would be more practical to upload the videos to YouTube. The videos became a hit, as more and more kids would use them to teach themselves. In 2009 Khan quit his job as hedge fund analyst at Connective Capital and started Khan Academy. It has now received grants from Bill Gates for $1.5 million, Google for $2 million and is starting to go global.

Data

Founded: 2006
Unique Users: 3.5 million.
Unique Visits per Day Evolution (compete)



Funding: 5.5 million (Sullivan foundation grants), Google $2 million, Bill Gates $1.5 million, John Doerr $100,000.
People: Salman Khan(ex MIT, Harvard Business School), Shantanu Sinha (ex McKinsey, MIT), Ben Kamens (ex Fog Creek Software), Jason Rosoff (ex Fog Creek Software)
Location: Mountain View, California.

Coursera

Description
Coursera is an education for-profit founded by computer science professors Andrew Ng and Daphne Koller from Stanford. Coursesera has currently courses from Stanford, Princeton, CalTech, University of Pennsylvenia.

It has not yet announced how it thinks to monetize their business model. According to Jeffrey Young, it is probable it will include some form of "fermium" service that includes any of the following possibilities:

- Certification: The student pays a fee to the school which issues certification of completion or adequate performance in the course which Coursera makes accessible in a verifiable format.
- Secure assessment: Coursera, for a fee, provides testing and verification of identity at physical locations.
- Sale of information to potential employers: for a fee, and with student permission, access to a database containing information about students and courses they have taken is sold to enterprises.
- Assessment of competency: for a fee paid by a potential employer or educational institution Coursera would evaluate the competency of a student.
- Tutoring or evaluation of progress: for a fee an employee or contractor of Coursera provides personal attention, tutoring or evaluating a student's work.
- Licensing or sale of the learning platform and courses to employers or schools for continuing education or course work, for example, at a community college.
- Sponsorship: For a fee, firms or foundation would sponsor courses. Only "non-intrusive" advisement of the sponsorship is contemplated.

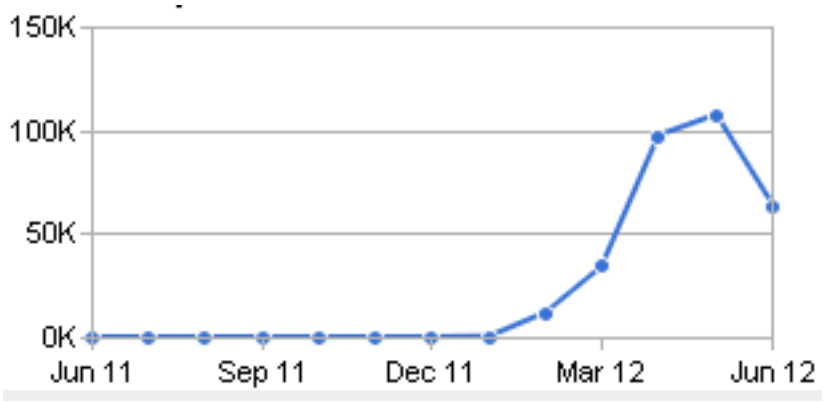
- Tuition: after a free trial period tuition would be charged for full access to a course and materials. Another possibility is use of the platform and materials by on-campus, or on-line, students enrolled in the course at the sponsoring institution who are already paying full tuition; in which case a small fee would be paid to Coursera by or on behalf of each student.

Data

Founded: 2012

Unique Users: 640.000.

Unique Visits per Day Evolution



Funding: $22 million (Kleiner Perkins Caufield & Byers, New Enterprise Associates)

People: Andrew Ng (ex Stanford, Berkeley, Carnegie Mellon), Daphne Koller (Stanford), John Doerr (VC, Rice Uni, Harvard Business School), Scott Sandel (VC, MBA Stanford)

Location: Mountain View, California.

edX

Description

edX is a non profit organisation funded by MIT, Harvard and recently added UC Berkeley. It is announced to start on Fall of 2012 and will provide the open source learning platform to other institutions. It will be directed Anant Argawal, Alan M. Garber and Michael D. Smith. Its business model is currently in progress.

Data

Founded: 2012

Capital: $60 million ($30 Harvard, $30 MIT)

Location: Cambridge, Massachusetts.

People: Anant Argawal (MIT, Stanford), Alan Garber (Harvard, Stanford), Michael Smith (Harvard, Stanford, Princeton)

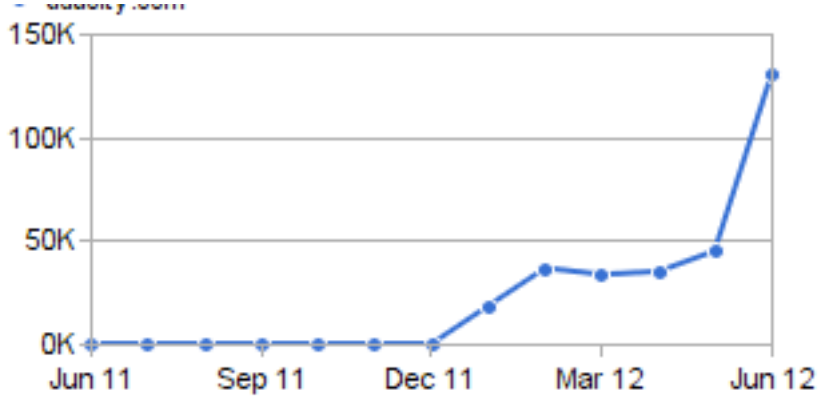
Udacity

Description

Udacity is a private educational organization founded by Sebastian Thrun (ex Stanford professor), David Stavens, and Mike Sokolsky, with the stated goal of democratizing education.
It is the outgrowth of free computer science classes offered in 2011 through Stanford University. As of June 2012, Udacity has eleven active courses.
Udacity is funded by venture capital firm, Charles River Ventures, and $300,000 of Thrun's personal money.

Data

Location: Palo Alto, California
Founded: 2011
Funding: n/a.
Unique Visits per Day



People: Sebastian Thrun (Google, Stanford, Carnegie Mellon), David Stavens (Stanford, Princeton), Mike Sokolsky (Stanford, Carnegie Mellon), George Zachary (Stanford, MIT)

Udemy

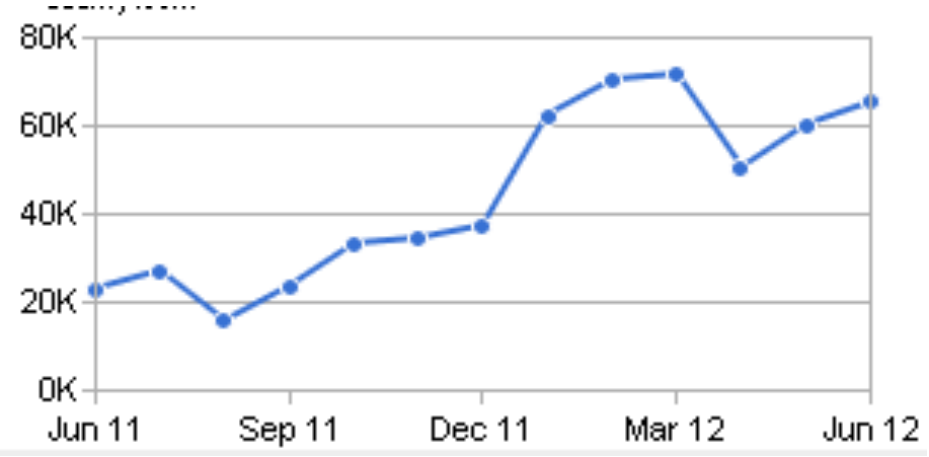
Description

Udemy is an online learning platform (website) that allows instructors to host courses. The site was launched by Eren Bali and Gagan Biyani in 2010, with a total $1 million invested, with investments from 11 people, including Jeremy Stoppelman (CEO of Yelp), Dave McClure, and Keith Rabois (an early investor in YouTube and LinkedIn).

Data

Location: San Francisco, Califronia.
Founded: 2010

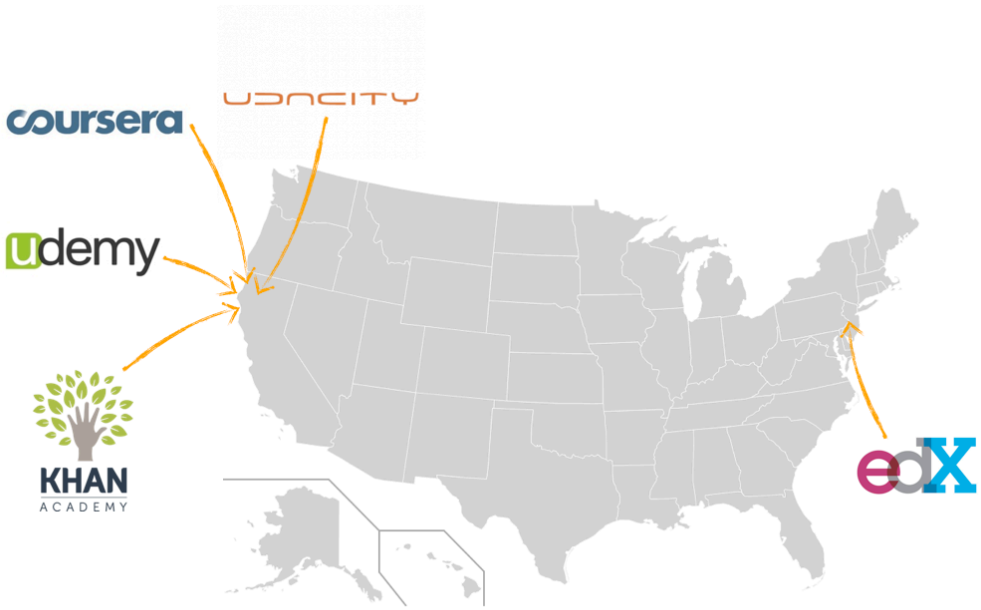
Unique Visits per Day Evolution



People: Oktay Caglar (Founder Institute), Gagan Biyani (Founder Institute), McClure (VC, PayPal), Jeremy Stoppelman (VC, CEO Yelp), Keith Rabois (VC, YouTube, LinkedIn)
Funding: $4 million.

C. Location

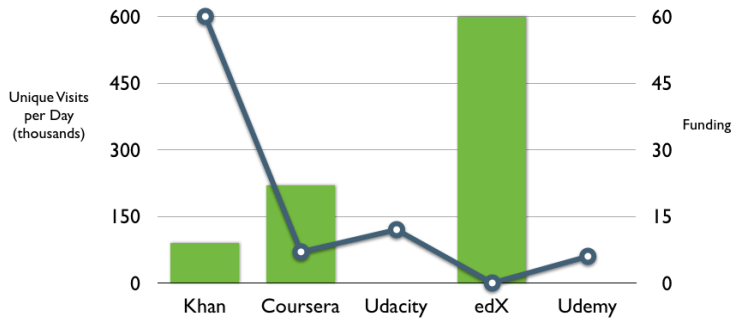
Today the scene is mainly in Silicon Valley, having only edX in Cambridge, Massachusetts. This factor is not minor, because location will influence greatly the rate of innovation and exchange of ideas.



Location, location, location….

D. Funding and Unique Visits

The following graph shows funding and unique visits per day for the main players in this new market.



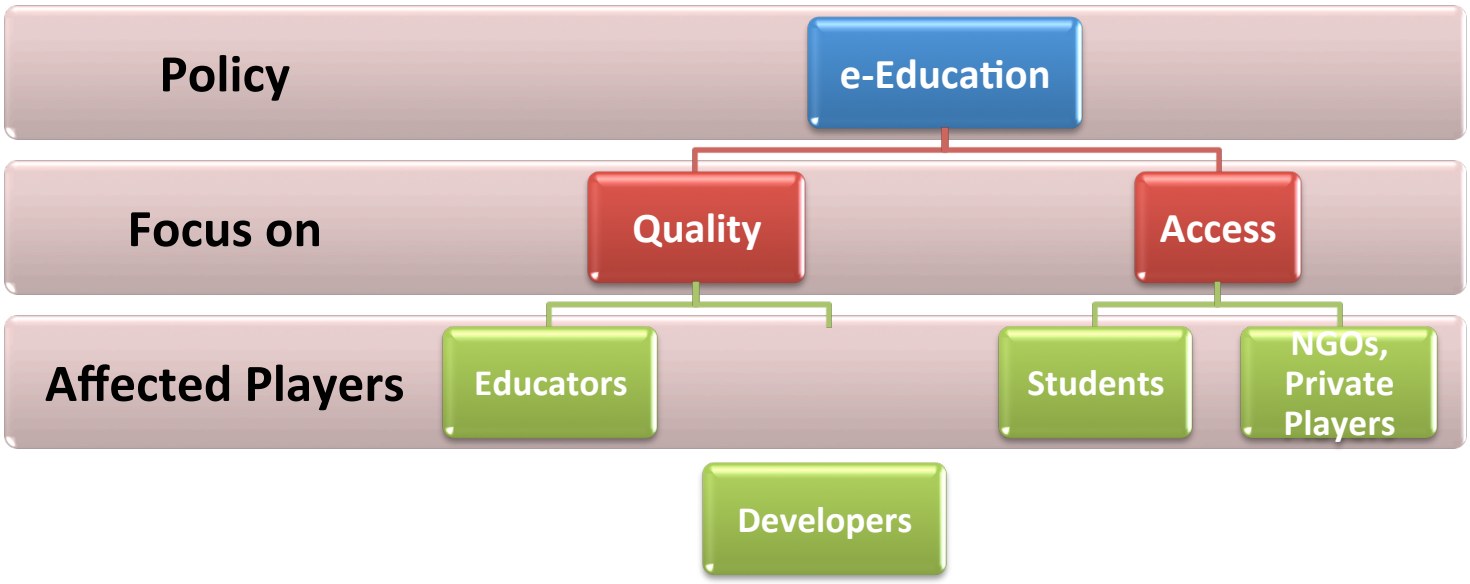
Funding and unique visits per day

The period of incubation with early precursors such as MIT OpenCourseware and iTunes University occurred up to 2009, while we are currently seeing the explosion and maturing of these technologies as players such as MIT and Harvard enter with edX. As with any technology, there will probably be a phase of overhype, followed by one of decreased expectations. However, in the long run, e-Education will reach its full potential, and, as we argued in the long historical evolution, change the world.

VI. Policy

Policies in relation to e-Education must "embrace both quality and access"[9]. Quality would concern the supply side of the platform, with the focus primarily on the educators themselves. Access, on the other hand, focuses on the demand side – the students or customer base of e-Education. Policies on access would concentrate on making e-Education more readily and easily available to a wider audience.

[9] Eklund, et al, p. 33. "e-Learning: emerging issues and key trends".



A. Quality

Policies that concerns quality will be towards content development of the courses being offered online. This would ensure that the education one gets from e-Education is at par if not better than what one gets from the brick and mortar traditional way of school education.

Government Initatives

Government interventions would be necessary to forward e-Education and place it at the forefront of learning tools globally. A foremost concern for e-Education would be the authenticity of the learning experience of the student. The fact that Coursera.com was started by Stanford professors already gives it a sense of believability. More of these initiatives must be done to give e-Education a good reputation and prestige that will be recognized worldwide.

Governments could look more widely-recognized weightage of online certifications by setting up certification bodies and collaborating with private players in the education and employment sectors to support e-Education.

B. Access

Policies on access have its eyes set on expanding the reach of e-Education. The quality of e-Education must be matched by its popularity for it to continually grow and be recognized globally. As such, governments must work towards promoting access to e-Education to more constituents through sponsorships and financial subsidies.

Government Subsidies

Government subsidies for e-Education improvement would also bring significant exposure for it to grow its platform by making it more available to a larger audience. Government subsidies have already started in some countries such as USA and India. In 2009, President Barack Obama pledged $500 million for online courses and materials as part of a multi-pronged plan aimed at expanding access to college.[10] In India, India government gave subsidies with the introduction of the 35$ android tablet. The cheap Android tablet was subsidized by the Indian government, so students can afford the tablet for their educational demand.[11]

Government could also looks at the inclusion of e-Education in public school curriculum. The introduction of e-Education during the early stages of child education would not only set a good foundation for familiarization with online tools, but will make acceptance of it much easier for the both parents and students. Engaging NGOs and other private players who are involved in promoting education would also be helpful as they already have the incentive and the necessary networks to promote e-Education more effectively.

VII. Recommendations & Conclusion

Recommendations

"e-Education should not be viewed as just a product, an identifiable artifact of learning objectives, contents and interactions. E-Education as a product is of uncertain value until it is deployed in a context that includes its users, technical and organizational attributes"[12] In essence, it is important that the e-Education portals understand the fact that the market is in its early growth stages and the product has to incorporate feedbacks from users more than any established product development would do. The value of these portals although evident, needs deeper look to understand the continued value creation, value for money and possible implications.

Continuous Innovations: What started as a simple process of digitizing the content and telepresence based teaching has evolved into interactive training courses. Augmented Reality, 3D hologram based teaching could be the way forward. Unless these companies keep innovating, it would be hard to survive in this intense competitive field. Given the basic premise that educational content has to be streamed to students, how well this is done makes all the difference.

[10] http://www.usatoday.com/news/education/2009-10-04-online-degree_N.htm

[11] http://venturebeat.com/2011/10/26/aakash-android-tablet-exclusive/

http://www.pcmag.com/article2/0,2817,2376165,00.asp

[12] Eklund, et al, p. 18. "e-Learning: emerging issues and key trends".

Invest in for long haul: Unlike other e-business, e-Education business takes longer to materialize. This can be attributed to building up the critical mass that trusts the quality of contents and sees value in the offerings. 'Me-too' websites will wither out in next couple of years and consolidation is bound to occur.

Conclusion

The online world is here to stay. The need for education to be democratized has long been overdue. Online education has now made it possible to provide quality education to virtually any part of the world at considerably reduced costs. With education being the great equalizer amongst men from different social backgrounds, e-Education has great potential as a powerful tool to uplift many lives. The success of e-Education greatly relies on capturing the interests of people and making them see the relevance of learning the courses in their personal lives. E-Education holds much promise for growth, so the issues that comes with it such as relevance, authenticity and security must be consciously and continuously managed by the its pioneers in order for it to remain engaging and robust.

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