Reflections on the Future of Global Higher Education
WAAS Conference Report

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Abstract

Education is the most important catalyst of social evolution. Today higher education is in the early stages of a revolutionary transition that will have immense impact on the future of global society. This article presents an overview of perspectives explored at the World Academy's Forum on Global Higher Education conducted at the University of California at Berkeley on October 2-3, 2013. It examines issues resulting from rapid changes in educational technology and organization that impact on accessibility, affordability, quality, relevance, employability and content of higher education. It envisions establishment of a World University Consortium as a network and umbrella group to facilitate educational partnerships and linkages with other interested stakeholders at the international level, to provide a centralized source of information about latest innovative ideas and developments in this field, and to explore creative solutions to enhance the reach, quality and relevance of higher education globally.

There are defining moments when the long, slow crawl of history leaps into the future. The Reformation, French Revolution, and birth of the Internet are instances. Such a moment has come for higher education. No one can predict with confidence what the future of higher education will bring, but it is certain to be very different from what we have known in recent centuries. Education is in the early stages of breaking the boundaries imposed by the physical classroom, the monastic insulation of the college campus, the arbitrary rigidities of degrees, courses and one hour lecture segments, the social barriers of class divisions and the economic barriers of affordability. Misinformation, misconceptions and myths abound, but beneath all the hype, there are real forces at work and real changes in the offing.

The World Academy's Forum on Global Higher Education was conducted to examine recent developments at the epicenter of educational innovation in Silicon Valley and to explore their potential implications for the world-at-large. The conference brought together leading educators from six continents to interact with faculty from UC Berkeley, Davis, Irvine, UCLA, Stanford, San Jose State, Carnegie Mellon, Duke, Phoenix, Florida, UNLV, San Diego State, Humboldt State, Brandman, Meridian, Berkeley City College, Mt. San

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Jacinto College, Ohlone College and Sofia University. They met with representatives from the Western Association of Schools and Colleges, International Association of University Presidents, Creative Commons, Policy Sciences Center, Tony Bates Associates, Center for Partnership Studies, Spire Education, InterEnvironment Institute, Center for Digital Education and Net Impact, diplomats from Colombia, India, Mongolia and Venezuela, and companies pioneering new technologies and services in the field of education, such as Google, Pearson, Fujitsu, 2U.com, uncollege.org, Knewton, StudyRoom, Talent2 Education and Accredible.

The Academy's emphasis on global higher education is a natural and inevitable product of its endeavor to frame a new human-centered paradigm for global development. Efforts to address the pressing global challenges related to the financial crisis, rising levels of unemployment, poverty, ecological imbalances, international security, democratization, global governance and rule of law all depend on raising the level of education and understanding of people around the world. Without enhancing the quality of human understanding, knowledge and skills, these problems will continue to defy solution.

1. Global Needs Assessment

There was a consensus among conference participants that significant changes are needed in the global system of higher education in order to meet the diverse needs of humanity. In his inaugural remarks, UC Berkeley Executive Vice Chancellor George Breslauer described the growing pressures on his institution to cope with stresses resulting from the very rapid pace of technological change, rising costs and globalization. While local conditions naturally vary, there was a broad agreement on seven priority objectives: expanding accessibility to make quality higher education available to a much larger proportion of the population in both economically advanced and developing countries; raising completion rates of students who enroll in college; bringing down the cost of education, which is an increasing burden to students everywhere; improving relevance to eliminate the mismatch between the knowledge imparted and the skills required by the labor force to achieve full employment; enhancing quality of education; applying innovative technologies for delivering content, interaction with students, evaluation, assessment and accreditation; and reformulating the content of courses and curriculum to more effectively address social needs.
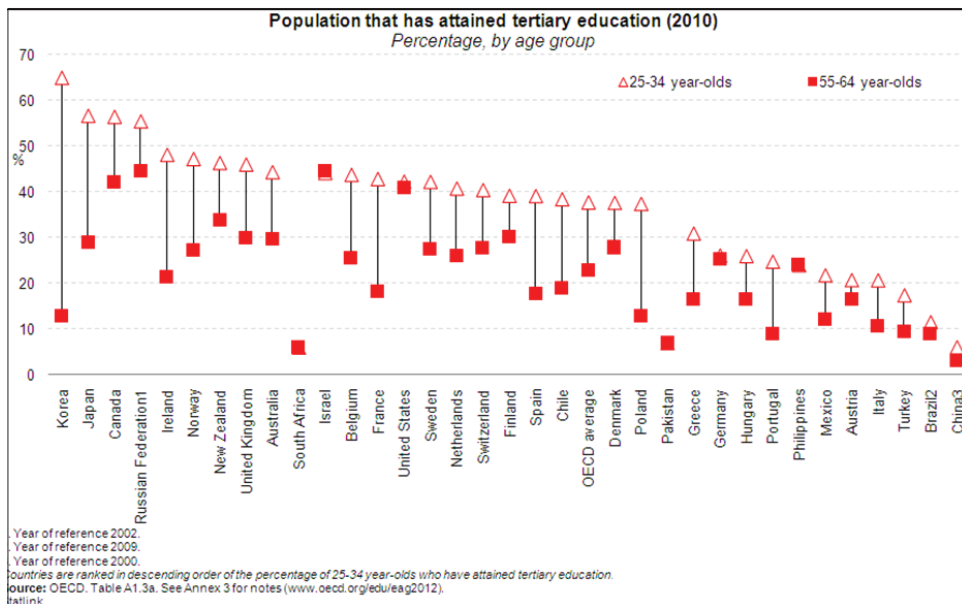

"A Chinese farmer would have to work for 13.6 years in order to fund tuition at a Chinese university, while those who live in wealthier urban areas pay the equivalent of 4.2 years of an individual's annual income on average."

Globally, levels of education are rising about 2% faster than GDP growth. The rapid expansion of the international Middle Class is generating increasing pressure for expansion of capacity in higher education. Figure 1 shows the percentage of the population in the age groups of 25-34 and 55-64 that has completed a college degree course in different countries.

Korea leads the world with 65% of 25-34 year olds obtaining a bachelor's degree or higher qualification compared with about the 40% average in OECD countries. Comparison of this age group with the 55-64 year old group reflects the rapid growth of higher education in recent decades.

An increasingly educated workforce is essential for responding to the growing complexity and sophistication of modern society and work. Globally, those with a college degree achieve higher rates of employment and earn significantly more than those with lower levels of qualification. According to a study by the Hamilton Project, an economic policy initiative at the Brookings Institution, those who graduate from a four-year college in the USA, on average, earn $20,000 more a year than those with only a high school diploma, as a result of the degree.[1] In spite of the clear economic advantage of higher education, the percentage of adults with at least a bachelor's degree ranges from a high of 45% in Norway to a low of less than 10% in many poorer developing countries as shown in Figure 1. In its report *A New Dynamic: Private Higher Education,* UNESCO estimates that the global system for higher education will need to expand its capacity to accommodate over 262 million students by 2025, up from 97 million in 2000.[2]

Figure 1: Percentage of the Population with Tertiary Education in Select Countries, 2010[3]

Affordability is closely related to accessibility, for the wealthy are never denied educational opportunity. Even in education-rich America, John Mitchell, Vice Provost of OLI at Stanford, pointed out that large numbers of qualified, economically disadvantaged students are being denied education due to the limited capacity of public systems. In Brazil an esti-

mated 4.5 million aspiring students will be denied higher education this year. Increasing accessibility is essential in all countries. A combination of rising costs, lower levels of economic growth and higher government budget deficits is forcing many universities in the USA to raise tuitions and reduce financial aid to the needy. Since 2000, the average tuitions and fees at public four-year institutions in the USA have risen by 72%, while the average earnings of full time workers aged 25-34 who only have a bachelor's degree has declined by 14.7%. Student debt has topped $1 trillion and is now the single largest category of private American household debt. The situation in developing countries such as India is even more precarious, as most of the expansion in higher education has been in private, for-profit institutions charging exorbitant admission fees beyond the reach of even Middle Class applicants. A survey conducted by the Associated Chambers of Commerce and Industry of India, ASSOCHAM, revealed that Indian parents invest an average 75% of their income in their children's education.[4] According to a Xinhua News report, a Chinese farmer would have to work for 13.6 years in order to fund tuition at a Chinese university, while those who live in wealthier urban areas pay the equivalent of 4.2 years of an individual's annual income on average.[5] Each year of higher education costs 6 to 15 months' labor for a rural parent in China.[6]

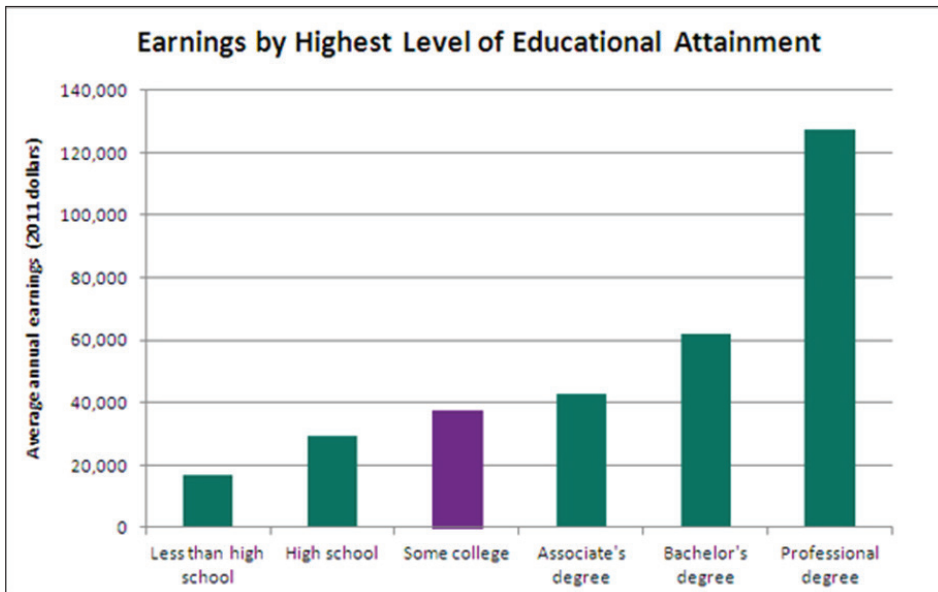### Table 1: Education Cost Affordability Rankings in Select Countries, 2010[7]

Country	Education Cost	Median Income	%	Rank
Australia	$7,692	$23,017	33.42%	12
Canada	$5,974	$26,623	22.44%	10
Denmark	$530	$22,929	2.31%	2
England & Wales	$1,243	$24,652	21.45%	9
Finland	$5,288	$21,010	5.92%	6
France	$585	$20,660	2.83%	3
Germany	$933	$22,020	4.24%	5
Japan	$11,865	$22,790	52.06%	14
Latvia	$3,299	$13,646	24.17%	11
Mexico	$5,077	$4,615	110.01%	15
Netherlands	$3,125	$28,032	11.15%	7
Norway	$596	$26,623	2.24%	1
New Zealand	$3,118	$19,265	16.18%	8
Sweden	$600	$20,716	2.89%	4
USA	$13,856	$26,990	51.34%	13

Table 1 compares the total cost of completing a four-year degree, including tuition fees, textbooks and study materials, in various countries with median national income. It shows the average cost of education which ranges from a low of 2.2% of median income in Norway to a high of 110% in Mexico.

Rising levels of unemployment severely aggravate the education challenge. Youth unemployment levels are double the national unemployment average in most countries, ranging from 35% in Italy and 38% in Portugal to more than 50% in Greece, Macedonia, Serbia, Spain and South Africa.[8, 9] While college graduates continue to earn significantly more than those who lack a degree, fewer graduates are finding a college degree an assured passport for remunerative employment.
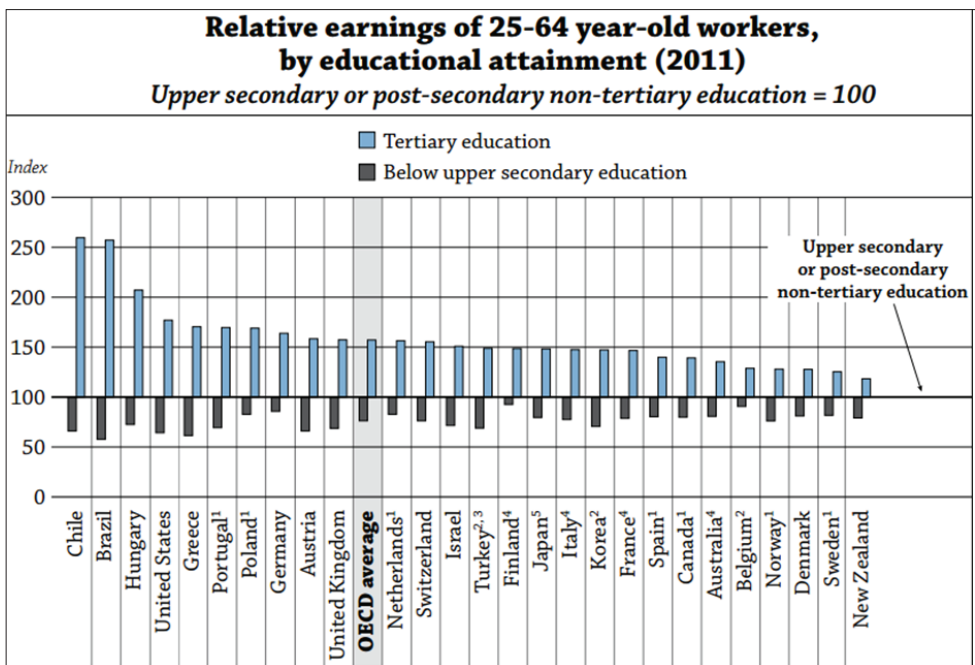
The correlation between level of education and level of income is clearly evident. More education clearly pays. In 2009 college graduates in USA recorded employment rates 18% higher and income levels 22% higher on average than high school graduates.[10] Figure 2 shows the earnings by level of educational attainment in USA.[11] The average annual earnings for a high school graduate in the US is $30,000, whereas for a degree holder, it is over $60,000, and for a professional degree holder, over $120,000. In OECD countries, on average, the relative earnings of those with a tertiary education is over 1.5 times that of those with lower levels of education. In Brazil, Chile and Hungary, it is more than twice the earnings of adults with lower levels of education.[12]

Figure 2: Earnings by Highest Level of Educational Attainment in USA (2008-12)[13]

At the same time, employers are increasingly critical of the failure of conventional degree programs to impart the knowledge and skills students require for successful careers. A new US survey of American entrepreneurs cited by *The Economist* reconfirms the complaint that companies cannot hire the right people because universities are failing to keep pace with a fast-changing job market.[14] Among the many noted deficiencies is the failure of higher education to equip students with the skills needed for working in teams, thinking for themselves, understanding other people and being creative.

Figure 3: Relative Earnings of Workers by Educational Attainment in Select Countries, 2011[15]

Quality education is still a luxury enjoyed by a few. In evaluating the quality of new educational delivery systems, there is a tendency to exaggerate the quality of traditional institutions of higher education, ignoring the fact that even in the finest institutions, the quality of instruction varies widely. Between the best and average differences in quality can be enormous, and even greater between the average and the lowest level of institutions. In developing countries, many institutions are very poorly equipped, faculties are under-qualified, student-teacher ratios are far too high, and many teaching positions remain vacant. In India the vacancy rate among public institutions is about 40%. One need only try to recall the number of truly inspiring instructors encountered during four years to realize how rare top quality education truly is. But the importance of quality is not diminished by its scarcity. Enhancing quality is as important and as great a challenge as expanding the system quantitatively.

A global needs assessment must also highlight the need for revolutionary changes in the content of what is being taught. In a world of increasing complexity and speed of change, the knowledge imparted by overly-specialized courses of study is grossly inadequate to equip students to understand the world they live in, adjust and adapt to change, earn a decent livelihood and contribute meaningfully to the development of society. The declining emphasis on the liberal arts is aggravating the problem. Interdisciplinarity, multidisciplinarity, transdisciplinarity are vital for providing students with intersectorial, integrated perspectives. There is ample and mounting scientific evidence that our relationship with ourselves, others and the

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planet we live in is the main variable influencing all the aspects of our lives. We need to see, think and act systemically. Economy is inextricably interlinked with technology, politics, law, society, management, psychology and the environment. Medical practice today requires an increasing knowledge of technology, sociology, psychology and ecology. Law is an artificial abstraction when divorced from an understanding of political and social processes. Vocational skills are inadequate unless accompanied by an understanding of other people, the capacity to work in groups, a knowledge of technology and its impact on human health. In an increasingly globalized world, citizenship necessitates an understanding of other nations, languages, cultures and historical periods.
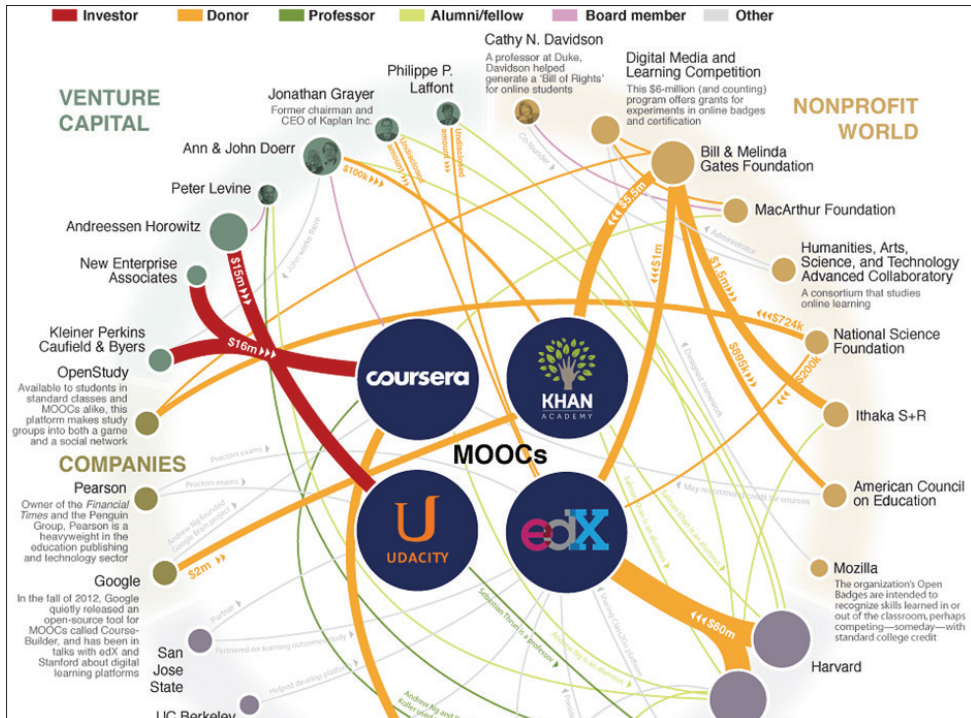
2. Is there Life beyond the MOOCs?

Can Online Education (OLE) successfully address the need to expand global capacity in higher education? Distance learning in one form or another has been around since the 1950s. Bob Horn was part of the first institute for educational technology established at Colombia University in the 1960s working on the first authoring system for computer-based instruction in collaboration with IBM. There is nothing especially new about online courses except the wildfire speed with which MOOCs or Massive Open Online Courses are spreading. UC Irvine launched open courseware in 2000 and now offers 90 courses online, including the entire undergraduate chemistry curriculum. Carnegie Mellon created its first web-based, free courseware offering in 2002. MIT uploaded their undergraduate courseware to the web a decade ago. UC Berkeley introduced its first online course with physical exams in 2007. Between 2004 and 2012, Oakland University in Michigan launched 20 online degree programs in the humanities and health sciences.

The past 18 months have witnessed an explosion of open, online courseware in American higher education, prompting the *New York Times* to proclaim 2012 the "year of the MOOC". Founded by Harvard and MIT in December 2011, edX now includes more than 20 partner universities offering 77 courses and more than a million students. Founded by Stanford professor Sebastian Thrun three months later, Udacity is already offering 25 courses to more than 400,000 students. And even more impressive, the youngest of the three, Coursera, now includes instructors from 73 universities, more than 440 courses and 4.7 million stu-

dents in 196 countries.[16] Universities such as UC Berkeley are experimenting with multiple approaches including public MOOCs, online for credit and certificate courses, and self-financing professional Master's Degree programs in fields such as public health and computer science. San Jose State, the oldest public university in California, already has more than 7000 students enrolled in about 100 online courses.

Figure 4: Major players in the MOOC Universe[17]

One result of the explosion of MOOCs has been to break down the traditional boundaries separating institutions of higher learning. Today many institutions are sharing their technologies, course content, students and even faculty with other institutions in the same country as well as with students and institutions in other countries. Education is going global.

There has been a vigorous debate as to whether the high dropout rate experienced by MOOCs is the result of a design failure or a failure to filter out underqualified, uncommitted students. Gary Matkins, Dean, Continuing Education and Distance Learning at UC Irvine, thinks that MOOCs are being critized for what they are not rather than being judged for what they actually are. The preoccupation with course completion rates has obscured more important qualitative issues – such as learning and retention rates among serious learners.

The sudden rise of the MOOCs has raised fundamental questions about the essential ingredients for effective education. Jorge Klor de Alva, former President of the University of

Phoenix, identified essential elements for a global educational model, including scalability, centralized aggregation of curriculum, structured scheduling, quality assurance, accreditation, financial viability and regulatory challenges posed by local and national authorities. It remains unclear how and to what extent MOOCs will be able to successfully address these and related issues.

Can online video lectures really equal or replace live contact with instructors in the classroom? The consensus of conference participants is that it cannot, but that MOOCs can play an important role as a complementary or supplementary tool for content delivery. UC Berkeley, Irvine, Stanford and many others are now experimenting with hybrid, flipped classroom models in which a significant portion of content delivery takes place online outside the classroom, leaving faculty more time to interact directly with students. MOOCs have proven an excellent medium for beta-testing new learning content and techniques. Philip Stark, head of Statistics at Berkeley, found that automated online testing freed up graduate student instructors to spend time working with students on problem solving and solution design. Armando Fox, Faculty Director, Berkeley Resource Center for Online Education, utilizes a hybrid system he calls SPOC (Small Private, Open Courseware), making it possible to expand class size from 40 to 100 students, while achieving better outcomes than through traditional classroom teaching. Candace Thille reported results from hybrid courses at Carnegie Mellon in which learning time was abridged from 16 weeks to 8 weeks and four classes to two classes a week, with better learning outcomes.

Khosrow Ghadiri at San Jose State utilized an online circuits and electronics course on edX, as part of a hybrid model. At home, students watched the online lecture, then filled out a survey designed to gauge which parts they understood and which gave them trouble. Ghadiri spent the first part of each class reviewing the most problematic topics. Then he broke students into small groups to work on solving problems together, and quizzed them individually on each day's material. At the end of the semester, 91% passed the course—a huge improvement over the 65% average pass rate over the past seven years. Georgetown University found it was able to expand its Master's Degree program in Public Health 20-fold and achieve better outcomes by taking it online, and its online nursing program was so successful that it cancelled the off-line program.

The evidence suggests that while MOOCs by themselves may not equal the quality of learning experience provided by classroom training in many universities, they can make the best quality course content accessible globally, including in places where a shortage of qualified teachers and textbooks deprives many students of access to reliable knowledge. What could be the impact on quality of higher education, if the world's most informed, inspiring and skilled communicators could be made available to students everywhere, anytime and in any language?

MOOCs in some form and combination with personalized interaction offer considerable promise as a solution for expanding accessibility and overcoming the critical shortage and high cost of faculty. Catheryn Cheal, San Jose State University Academic Technology Associate Vice-President, reports online instruction combined with online proctoring of exams enables a single instructor to serve 700 students for statistics courses, 14 times the 50 stu-

dents manageable by traditional classroom methods. For psychology, the comparable figure is 400 students. In future groups of campuses could be pooling their courses to widen the range available to students everywhere.

Fabian Banga of Berkeley City College calls for a much broader conception of open educational resources that incorporates the full power of network connections between faculty and students and peer to peer among students. He is experimenting with innovative learning platforms and other enormously powerful technologies for interconnectedness, including Google hangout, YouTube, and Twitter.

The California Community College System, which covers 2.4 million students enrolled in 112 campuses, is the largest system of higher education in America. Mike Orkin, Vice Chancellor of Educational Services at Peralta Community College District, described how the State of California plans to link all these institutions together so that students enrolled in any campus can have access to thousands of online courses offered by other colleges in the system. This is only one example of a trend that could eventually lead to development of a world university network.

3. From Teaching to Learning

Regardless of the ultimate fate of the MOOCs, their dramatic arrival is likely to have a lasting impact on higher education. A profound shift is occurring in ideas about what higher education is all about. The ability of a teacher to deliver classroom lecture content to hundreds, thousands or even hundreds of thousands of students simultaneously raises more fundamental questions about the true nature of education and the true role of faculty in delivering it. In an age of ubiquitous information and YouTube-like streaming video systems, is content delivery the sole or primary role of instructors? Or is there something more to teaching? The transmission of specific knowledge content is no longer viewed as the sole or predominant goal. The emphasis is shifting from knowledge content to pedagogy, from teaching to learning. According to Mark Fink, Vice Provost at UNLV, the role of faculty is shifting to facilitating learning, which is what it should have been all along.

Exposed since birth to the intensities of a digital, interconnected, interactive world, the younger generation wants a more active type of learning experience. Mohammad Qayoumi, President of San Jose State University, calls for the creation of a new eco learning system that utilizes technology as a weapon for mass instruction. Situated in the heart of Silicon Valley, he insists that rapid innovation is as important for educational institutions as it is for business success.

The advent of Open Learning Initiative (OLI) systems has revived age-old debates regarding teaching and learning and spurred studies to try to understand more about how different types of students learn different types of subjects. Few, if any, of the conference participants believe that OLI can completely replace human interaction between students and instructors. But most would agree that OLI is shifting the emphasis from content delivery to how best to promote active learning by students, marking a change in emphasis from Learning Management Systems to Adaptive Learning Systems.

4. Changing Roles of Faculty and Students

Recent developments in OLI have raised many questions regarding the role of the instructor in higher education. No longer is the instructor adequately described as one who has already acquired knowledge. Instruction implies also the capacity to transmit it effectively to others. This in turn requires a knowledge of the learning process and how to facilitate it. Furthermore, the conversion of live lectures into OLI requires several sets of skills that few faculty members now possess.

The rapid growth of the MOOCs has only been made possible because they have broken up the task of course development into numerous roles, each performed by a specialist. Faculty provide the content. Learning architects trained in structural design create workflow process models to improve learning speed and retention rates. Content developers reorganize the content into smaller segments of knowledge, typically 10-15 minutes in length, combined with short quizzes and interactive exercises. Trained actors are often utilized to film lecture segments. Udacity is experimenting with the use of mentors available 24 hours to monitor student learning activity, help them acquire skills in self-learning, motivate them to work on their own and promote interaction with other students.

One of the challenges is to devise the right mix of incentives to overcome the indifference, fear or reluctance of faculty to embrace new methods. Developing and running online courses also require a considerable investment of time by the faculty who design and administer them. Philip Stark estimates that he invests roughly four times more time supporting his online courses than traditional classroom courses, although he is able to cover 2.5 times more students in the process. By one estimate it requires up to 400 hours to convert a traditional lecture course into a fully interactive online learning experience. Once the course is developed, the time invested per student taught may come down dramatically and eventually prove far less than that of classroom training, but the high barriers to initial entry represent a real obstacle to rapid adoption of OLI courses by large numbers of faculty. John Mitchell estimates that about 100 members of the Stanford faculty will engage in OLI in 2013, representing about 5% of total faculty. If this is the case in the innovative birthplace of Coursera and Udacity, rates of adoption must be far lower in most other universities. At SJSU, another pioneer, thus far about 0.5% of faculty are presently engaged in OLI. These low participation rates reflect the fact that we are still in the very earliest stages of the OLI revolution and it is difficult to envision how far and what form these new learning platforms develop. OLI requires new types of infrastructure to support data capture and analysis to access the effectiveness of different tools and methods. In order to facilitate the radical transition of universities to cope with the challenges of an online environment, organizations such as 2U.com are partnering with academic institutions to bring their content online.

The development of OLI is also making it possible to harness the enormous knowledge and teaching capacity of retired faculty to fill the growing gap between the demand and availability of qualified instructors and to utilize their capabilities to teach people anywhere in the world.

The conception of the student is also rapidly changing. Today only 17% of college students in America are full-time. The traditional conception that employment follows higher education is no-longer valid. More and more people are going back to college to augment their learning either as a support for career development or a means to enrich their years in retirement. The average student in the USA works 19-20 hours per week, which means he or she is both student and employee. More than 40% of adults participate in formal and/or non-formal education in a given year across OECD countries. The average age of online learners is now 34, up from 27 in 2002. MOOCs may form a critical element in future educational systems designed to promote life-long learning. The relationship between education and employment must necessarily undergo a significant change in future in order to equip workers of all ages with the ever increasing range and levels of skills required to maintain competency in an increasingly sophisticated labor marketplace. Orio Giarini and Mircea Malitza called for transforming this relationship into a "double helix of learning and work".[18]

MOOCs have also accelerated the globalization of education. Dan Clancy, Director of Education at Google, believes that the biggest shift in global education will be the rising importance of the non-Western world. Presently 60% of Coursera students are overseas and 80% already possess a college degree.[19] The six countries with the highest online enrollment in Coursera courses (after the U.S.) are Brazil (5.9%), India (5.2%), China (4.1%), Canada (4.1%), the United Kingdom (4%) and Russia (2.4%).[20] Among edX's students, 9% come from Africa and 12% from India.[21] SJSU is training Pakistani instructors how to teach online. UC Irvine's chemistry courses are being utilized by faculty in Africa.

5. Education as Dialogue

No longer is education a one-to-many process. The emerging learning model is the network. In an age of mechanization and massification, it is easy to lose sight of the fact that education is essentially an organic process of transmission that takes place from one human being to another. The capacity to acquire, accumulate, codify and transmit knowledge from one person to another and from one generation to another is the most striking characteristic distinguishing human beings from other species on earth. No matter how powerful the technologies we develop for storage and delivery of information, education is a dialogue between living beings – an exchange of ideas and perspectives between conscious minds. Human interaction has always played and always will play an essential role in effective education. As Aftab Omer, President of the Meridian University, put it: "The challenge is to integrate high tech with high touch."

Clancy likens recent developments in education to what has occurred in the television industry over the last few decades. Broadcast TV was the primary delivery mechanism until cable, satellite, VCR, digital video, the Internet and YouTube gradually made inroads into its territory. Today broadcast TV accounts for only 11% of total video viewing. Something similar is likely to happen in higher education, where until very recently brick and mortar universities accounted for the vast majority of knowledge dissemination. Clancy expects peer to peer instruction, including small group learning and team assessment, to play a much

greater role in the education of the future. As he put it, "The crux of education is social inter-action."

There was a time when reading and writing were rare endowments and the majority relied on a very few to perform these essential functions. Advances in education enable most people on earth to now perform these functions themselves, but we still rely on other minds to develop ideas and present knowledge in forms we can readily understand and absorb. Technological advances facilitate the delivery of knowledge from one mind to many others, but they have not and cannot entirely eliminate the essential role of thoughtful human interactions.

OLI cannot eliminate the need for human interaction in the learning experience. But it may radically alter the sources of that interaction. Ken Goldberg, a UC Berkeley professor, estimates that human beings currently spend about 10 billion minutes a day on Facebook and generate 400 million tweets. He and Yuko Okubo of Fujitsu have been collaborating to develop a social innovation tool called Opinion Space, a collaborative discovery engine that allows large groups to brainstorm.

In future some aspects of the role of the teacher may increasingly be performed by students themselves. Recent studies testify to an obvious truth which every instructor knows from personal experience, i.e. we learn best when we teach others. The absence of live contact with teachers has led the MOOCs to focus on ways to promote more interaction between students through online chat rooms, Q&A systems and physical meetings of their own. Coursera encourages both online and offline interaction. Online, the response time to questions posted on Coursera forums is 22 minutes. Offline, there are Coursera communities spread over 2,787 cities worldwide that enable students to connect with each other. Courserans in the same geographic location can form communities and plan meetings. Any member can suggest a date and venue to initiate a meeting to form study groups, share ideas, and socialize too. Online social learning platforms such as StudyRoom and Grockit facilitate meeting classmates outside the classroom. Students can join a study group for any subject of their choice, and share, collaborate, learn and teach. Educators can form their own virtual classes, and connect to their own and other students online. The service tracks student engagement and participation, and helps identify active and contributing students. StudyRoom monitors the level of interaction between students, incentivizing students who teach other students and making it possible for more advanced students with proven competence to earn money by offering assistance to students in courses they have already completed. 2U.com is also experimenting with ways to incentivize more advanced students to work with those who need assistance, so that mentoring forms an integral component of the learning process.

6. Evolution of the Textbook

The classroom and the instructor are not the only things that are changing. The shift from print to electronic media is transforming the textbook from a passive medium for knowledge storage into an active, interactive, dynamic learning platform combining text, images, audio, video, animation, data analysis, self-paced learning and continuous performance assessment into an integrated learning system.

Pearson, the world's largest textbook publisher, is in the process of reorganizing itself around emerging technology and global needs. Data analysis of individual learning patterns now makes it possible to develop products that deliver personalized learning experiences to each student. Pearson is also experimenting how to promote virtual peering between students for both motivation and knowledge transfer. Pearson's ebooks have, in addition to the entire textbook, interactive quizzes, weblinks, audio, video, animation and search features. Highlighting and making notes are possible. They also allow the creation of study groups to share notes with friends. McGraw Hill's LearnSmart software serves as a personal tutor. It can predict what the student is most likely to forget, and when. It analyzes how students perform in embedded quizzes and which concepts stump them. It can then create a personalized reading experience by highlighting the most important concepts a student needs to learn at that moment. As the student progresses, it adapts and adjusts the content based on his or her individual strengths, weaknesses and confidence, ensuring that the time spent studying is efficient and productive.

The boundaries between information and edutainment are thinning. Digitization is also broadening the concept of 'textbook' to encompass the rich and varied reservoirs of quality content offered by sources such as National Geographic, Scientific American, Psychology Today and Discovery Channel.

Knowledge grows by free exchange. Globalization of access to information goes hand in hand with globalization of education. Creative Commons is a not-for-profit presently working with governments, educational institutions and foundations in 72 countries to establish global standards for open licensing of content that facilitates free sharing, while protecting the legitimate rights of authors. Google has already invested $180 million to digitize about 30 million books, but without much revenue or needed legal agreements. Making access to the world's digital libraries universal will certainly be of great benefit to students worldwide. WAAS Fellow Lloyd Etheredge is working on a legal framework for an economically-sustainable digital Global Public Library, made accessible free of charge to individuals, including a usage-based, global payment system.

7. Accreditation

Gone are the days when the university was the sole repository or delivery point for in-depth formal knowledge delivery. Universal access to information and knowledge codified as courses is leading to what Ralph Wolff, former President of the Western Association of Schools and Colleges (USA), terms the 'deinstitutionalization of learning'. He estimates that only about 17% of formal learning in the USA takes place in traditional programs. The rise of the MOOCs is leading to a coursification of learning, in which knowledge is delivered course-wise rather than degree-wise. There is an increasing emphasis on competency-based programs without credit hours, in which students study on their own and then are evaluated in terms of the extent of knowledge acquisition.

Accreditation is one of the greatest challenges faced by the plethora of emerging MOOC platforms. Hundreds of thousands of students are flocking to the MOOCs for free access to world-class course content, but the creation of professional quality courses is a costly,

time-consuming process requiring sophisticated technology and expertise and costing as much as $100,000 per course. Moreover most students enroll in courses in order to obtain a valid proof of competency which will aid them in seeking a job or advancing their careers. Thus, accreditation is essential for the rapid adoption of online forms of education and the power of accreditation presently resides where it always has in traditional brick and mortar institutions.

Early adapters are experimenting with various ways to make OLI financially viable. For-profit startup, Coursera, is addressing this problem by offering certificates of completion to students who pay an additional fee. Some universities are offering credit for OLI courses provided students pay tuition fees and appear for physical exams. The University of Maryland University College has announced that starting from Summer 2013, it will award transfer credit to those who have taken and can prove what they have learned from certain MOOCs. To get credit, students will have to prove that they know the material, either by taking a paid version of the course, which includes proctored exams, or by going through a rigorous "prior learning assessment" process at UMUC, which measures competency on a topic.

The American Council on Education, which advises college presidents on policy, has evaluated MOOCs—five from Coursera and four from Udacity—and recommended to its members that students who pass those courses should be awarded transfer credits.[22, 23] San Jose State University, Georgia Institute of Technology, Colorado State University, the American Public University system, Central Michigan University, Kaplan University, Regis University, the State University of New York's Empire State College and Western Carolina University award transfer credit to students who have studied through MOOCs.[24, 25]

A variety of new online institutions are also being formed to test alternative designs. University of the People is a free, online academic institution approved by the California Bureau for Private Postsecondary Education to award degrees and has applied for accreditation status. World Education University, which opened in February 2013, offers 100% free college level education to anyone, anywhere, anytime, supported by an innovative advertisement-based revenue model. Their academic catalog consists of 341 courses, and they offer 43 different degree and certificate programs. As of September 2013, WEU had students in 179 countries enrolled in their online courses. WEU is also in the process of applying for accreditation. Minerva Project aims to be an online Ivy League university, providing students with a four-year American university education, starting in Fall 2014. It hopes to receive accreditation through a partnership with the Keck Graduate Institute, a part of the Claremont University Consortium.

According to the old management maxim, you get what you measure. Therefore, new credentialing systems are based on the premise that learning involves much more than merely the acquisition of specific course content and that measures need to be refined to access acquisition of a much wider range of competencies than merely text and lecture based knowledge. Will degrees remain the primary credential for certifying learning? Possession of a university degree conveys relatively little specific information about the competencies a student

has acquired. New models such as Degree.com and Accredible.com are facilitating the shift from degree-based to skill-based learning models. The founders of Accredible, Alan Heppenstall and Danny King, envision a decoupling of the educational and certification processes. They are trying to shift the focus from certification of courses taken by students to validation of the actual competencies a person has acquired and can document, regardless of whether they were obtained through traditional classroom instruction, online learning, on the job learning or other forms of life experience. Accredible is

"A new paradigm in education must be based on new thinking."

a comprehensive and inclusive form of credentialing that makes it possible for individuals to develop their own personalized, customized knowledge profiles validated by a variety of means, including formal certification, the testimony of experts, and other forms of evidence. Alternative means of certification such as the one being developed by Accredible can play an important role in making MOOCs credible.

Another approach is being developed by Joanna Normoyle, Experiential & Digital Media Learning Coordinator at UC Davis, who is experimenting with new types of curriculum designing and new recognition systems to help students develop important skills necessary to address sustainability issues in the real world related to problem solving, thinking, communicating, design, visioning, marketing, management and social interaction. A system of badges is being used to incentivize new types of experiential learning, competence, knowledge and values.[26]

Globalization poses another challenge to traditional forms of accreditation. Education is going global. American universities are now educating about 800,000 foreign students every year.

American universities led by NYU are establishing campuses and affiliated degree courses overseas. As the size of their college-age populations levels or declines, European countries are also striving to attract more foreign students. At the same time, the promise of high quality education is attracting more students from developing countries to the world's premier institutions of learning. Standardization and internationalization of credentialing would significantly facilitate global educational exchange.
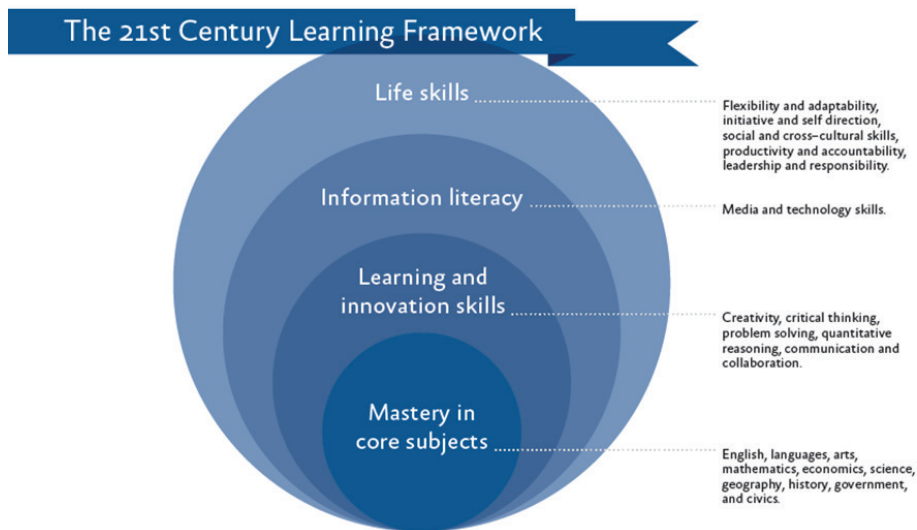
Globalization is giving rise to new models. Founded in 1999, Laureate International Universities network has grown to include 72 institutions in 30 countries throughout North America, South America, Europe and Asia. Institutions within the network operate both campus-based and online programs with a total enrollment of more than 780,000 students.

8. New Foundations for Higher Education

A new paradigm in education must be based on new thinking. As one of the Academy's founding fathers, Albert Einstein, said *"We cannot solve our problems* with the same *thinking* we used when we *created* them." Side by side with the need to educate more people better is the need to reconsider the intellectual foundations on which current knowledge is based. While technology has been a powerful driver for expanding access to affordable

education, a parallel movement is needed to re-examine prevailing notions regarding the fundamental purpose of education, the division of faculties into separate disciplines, and the essential nature of the knowledge needed for accomplishment in the 21st century. As Emil Constantinescu, former President of Romania and Rector of the University of Bucharest, observed, "Modern knowledge cannot and should not be reduced to a technical compilation and use of information. Knowledge has to be co-extensive with the depth and breadth of human wisdom, accumulated over millennia. Bare information opens a royal way to massification, whereas knowledge stimulates the harmonious development of responsible individualities." While concern with foundations of knowledge and education is not new, the tumult of change stirring higher education today has created the need and opened the way for greater exploration of these profound issues.

Figure 5: The Learning Framework for the Future

We have already noted the emerging shift from subject to person, from teaching to learning, from concentration of content to concentration on the learning process. The essential goal of all education is to enhance the capacity of the student to acquire and utilize knowledge in a living social context, which includes the ability to seek, gather, process, assess and absorb ideas, information and experience; to modify existing understanding based on new facts and perspectives; to utilize what is known to solve problems involving aspects that are uncertain or unknown; to interact effectively with other people both for the exchange and enhancement of knowledge; and to apply all these capacities to enhance all aspects of human security, social welfare and psychological well-being. Most of these objectives are at best incidental or even contrary to the design and actual delivery of most higher education models today. We need to foster at every level of society an awareness of the social construction of

reality, of our powers and responsibilities for the present and future of humankind and the whole planet. We need more effective intellectual perspectives to correctly diagnose the problems and formulate effective, sustainable solutions.

"Social reality is not divided into courses and disciplines – it is an indivisible whole."

Mohammad Qayoumi supports the call of the US-based Partnership for 21st Century Skills for a wider conception that embraces core subjects, learning and innovation skills, information literacy and life and career skills as depicted in Figure 5.[27, 28]

The felt need for new learning paradigms is a reason for the success of unconventional alternative learning models such as UnCollege.org, which was founded by college drop-out Dale Stevens in 2011. Stevens refers to his model as unschooling to contrast it with traditional forms of homeschooling. UnCollege offers students an opportunity to learn how to learn in non-traditional environments while taking a year off from college. It offers The Gap Year, a one year program that consists of a residential program with other UnCollege Fellows, a stint abroad, an internship, and ends in the completion of a real project. This one year helps students to develop meta learning skills. They participate in workshops and roundtables, meet entrepreneurs, work or volunteer in a foreign country, and gain real world work experience. The internship may be at a giant tech company, a small startup, or a charity distributing aid in Africa. The project could be organizing an exhibition of photographs, publishing a book, or creating a functioning company. UnCollege introduces the Fellows to a network of mentors, and offers them assistance in becoming financially independent at the end of the program. Stevens' ultimate objective is more revolutionary. It is to offer a complete alternative to formal higher education that will more effectively equip youth with the initiative, confidence, problem-solving capacities and social skills needed for success in any field of endeavor.

The World Academy is focusing on the future of education precisely because education is such a powerful determinant of our collective capacity to address the pressing issues confronting humanity today. Although interdisciplinary and multidisciplinary courses have been around for decades, they still occupy a marginal place in higher education, often perched precariously between two or more stools of conventional disciplines. But social reality is not divided into courses and disciplines – it is an indivisible whole. Economic and financial issues are inextricably interlinked with and based upon issues of law, governance, human rights, social process, individual psychology, culture, geography, ecology and historical development. This is the rationale for the Academy's quest for a New Paradigm for Human Development that recognizes the common theoretical foundations and practical implications of the world's most pressing challenges.

Throughout history, education has gradually and incrementally evolved in response to changing social needs, more commonly to conserve past achievements than to pioneer the future. As Roberto Peccei, former Vice Chancellor of UCLA, put it, "Universities are better suited as repositories of knowledge than as agents of change." In future we need institutions that will not only transmit the rich heritage of past knowledge to younger generations, but also pioneer the ideas needed to build a better world.

Robert Fuller, former President of Oberlin College, describes education as the single best weapon of counter-terrorism to meet global threats. As American colleges in the 1970s became the active instrument for racial integration in response to rising levels of social unrest, effectively creating a black middle class, Fuller says that today the world faces a similar challenge at the global level, the challenge of rapidly developing the potential of more than one billion people in developing countries to create a global middle class. WAAS can be a leader in that movement.

At a still deeper level, education is founded on and inseparable from human values. Values represent the quintessence of wisdom acquired over centuries as to the fundamental principles governing human accomplishment, individual and social. They are not merely inspiring ideals. They also have profound practical importance. Formal education supported by family, culture and religion are the principal means for the transmission of values from one generation to the next. The multiple crises confronting humanity today are indicative of a need to consciously inculcate higher values through the educational system.

The achievements of Western society have been made possible by recognizing the value of the individual human being and providing the widest latitude of freedom for individual development. Its problems arise from the absence of a corresponding emphasis on individual social responsibility to the collective that has contributed so much to enhance the life of its members. Technology and organization have been powerful drivers of social progress, yet in the process they have almost come to supplant and suppress the value of the human beings who have developed them and whose welfare they intended to serve. Modern science and technology are a superb testament to human creativity, but become monstrous when applied without reference to their impact on people. Modern organization is godlike in its effectiveness, but it becomes inhuman when a system or procedure is divorced from human welfare and well-being. No longer can we abide by the notion of education as purely objective, neutral and value-free. If it does not consciously impart values of freedom, equality and dignity for all, then by that very omission it sanctions their very opposites.

As education goes global, great care must be taken to counter a subtle form of cultural imperialism that will almost inevitably impose Western values on populations whose cultural heritage is very different from our own. Conscious efforts should be taken to promote MOOC courses by scholars and experts from all cultures, so that the university of the future truly becomes a global learning ground where all cultures can gain and all can give. Conscious emphasis must be placed on those values which are truly universal and on respect for cultural differences, whether they result from geographic distinctions between people or from societies in different stages of social development.

9. The Ultimate Question

The Millennium Development Goals focus on primary education. In contrast, the Berkeley discussion gave voice to the conviction that higher education can and should be made available to all and it called for recognition of access to higher education as a fundamental civil right.

Much of the experimentation witnessed so far is an effort to use familiar methods to meet the needs of a new context, when what is really required is to evolve a new approach at a higher level. The rapid expansion of global needs and capabilities calls for the formulation of an entirely new paradigm for global education.

"Today a World University is an idea whose time has come."

It is far too early to predict the most likely form that global higher education will take in the coming decades, but the forces driving that change are sufficiently powerful to ensure it will be very different than the form that has endured with only minor variations over the past two centuries. Reflection on recent developments helps us formulate the questions that need to be asked. But, as Ralph Wolff, put it, "If you think you know the answers, you just aren't asking the right questions."

The World Academy's Forum at UC Berkeley sought to pose the ultimate question to participants which no one seems yet to be asking: "If you were asked to design a world-class system of higher education accessible to all human beings, how would you do it?"

The question has already evoked some inspiring answers. Lloyd Etheredge envisions a Global University Movement whose mission is to provide "An education equal to the best in the world, available to everyone." Going beyond MOOCs, it would include many educational and technical options, honoring the dignity of each individual, a world that warmly welcomes each young person and is committed to providing resources for them to develop their potential and have a life that they love, lighting fire under national and local government officials to make supportive investments for rapid progress, generating solutions to translation challenges, volunteering enrollment for tutoring and coaching, creating opportunities for private sector startups in each country, and developing a Global Public Library of at least 30 million volumes available to the global public free of charge.

10. World University Consortium

The World Academy was founded in 1960 by distinguished individuals concerned by the impact of the explosive growth of knowledge to address global issues related to the social consequences and policy implications of knowledge. Their aim was to create a forum where problems can be discussed objectively, scientifically, globally and free from vested interests or regional attachments, to arrive at solutions that affirm universal human rights and serve the interests of all humanity. WAAS was founded on faith in the power of original and creative ideas – Real-Ideas with effective power to change the world and its motto is "Leadership in thought that leads to action".

The Academy's founders intended that WAAS should function as *"an informal World University at the highest scientific and ethical level, in which deep human understanding and fullest sense of responsibility will meet."*[29] Although some modest beginnings were made in its early years to establish regional centers of excellence, political conditions at the height of the Cold War, as well as limitations in transport and global communication, posed insurmountable obstacles to realize this vision at that time. Today a World University is an idea whose time has come.

A major objective of the Berkeley conference was to assess the need and potential for the establishment of new types of educational institutions dedicated to realizing this vision. The World Academy's Forum on Global Higher Education provided an excellent opportunity to examine recent advances, brainstorm on new models and creative solutions for establishing a world-class system of higher education available to all humanity and to forge an international alliance of stakeholders committed to making it happen.

At the forum, the leadership of WAAS announced the founding of the World University Consortium, a network and umbrella group to facilitate educational partnerships and linkages with other interested stakeholders at the international level, to provide a centralized source of information about latest innovative ideas and developments in this field, and to explore creative solutions to enhance the reach, quality and relevance of higher education globally. A radical change in conception is imperative. A truly global education cannot be limited to the perspectives of one or a few nations or cultures.

The mission of the Consortium will be to evolve and promote development of accessible, affordable, quality higher education worldwide based on a human-centered approach that shifts the emphasis from specialized expertise to contextualized knowledge within a trans-disciplinary conceptual framework reflecting the complexity and integration of the real world. It will strive to shift the emphasis of higher education from teaching specialized content to learning that enhances the capacity of students to think and discover knowledge for themselves, from theoretical mastery to acquisition of knowledge, skills and values relevant to each individual's personal development and career – an educational system better suited to develop the full potentials of social personality and individuality for productive engagement, social welfare and psychological well-being.

The consortium will pursue several closely interrelated objectives. It will strive to identify best practices globally and promote effective models to improve accessibility, quality, affordability, employability, innovation and social relevance in higher education. It will explore innovative open learning systems and online and hybrid delivery systems. It will encourage experimental research and application of advanced methods to improve the learning process. It will promote person-centered approaches that emphasize self-guided learning, critical and original thinking, inspirational forms of instruction, learning to learn, cross-cultural and trans-cultural, multi and trans-disciplinary contextualized perspectives and experiential learning.

From its inception, the greatest resource of the World Academy has been the network of its talented, committed members and the many other individuals and institutions with which our members are closely bound by work and values. WAAS is an embodiment of the ultimate value of the human resource and the unlimited creative potential of human beings. The Consortium will seek to create a worldwide forum where all the stakeholders can meet, interact and create new networks, partnerships and projects.

Many excellent ideas have already been proposed regarding the range of activities the Consortium may undertake in pursuit of its mission and objectives. In the coming year

WAAS will be reaching out to its Fellows and partnering institutions to formulate strategies, establish priorities and frame a plan of action. We invite all those within and outside the Academy to join us in this collective endeavor.

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Notes

1. Michael Greenstone and Adam Looney, "Regardless of the Cost, College Still Matters," *The Hamilton Project* http://www.hamiltonproject.org/files/downloads_and_links/September_2012_Jobs_Report_FINAL.pdf

2. "A New Dynamic: Private Higher Education," *UNESCO* http://unesdoc.unesco.org/images/0018/001831/183174e.pdf

3. "Education at a Glance 2012," *OECD* http://www.oecd-ilibrary.org/education/education-at-a-glance-2012_eag-2012-en

4. "Steep Rise in Education Fees," *The Associated Chamber of Commerce and Industry of India* http://www.assocham.org/prels/shownews-archive.php?id=3914

5. Michelle FlorCruz, "China's Steep University Tuition Costs The Average Farmer 13 Years Of Income," *International Business Times* http://www.ibtimes.com/chinas-steep-university-tuition-costs-average-farmer-13-years-income-1101434

6. Keith Bradsher, "In China, Families Bet It All on College for Their Children," *The New York Times* http://www.nytimes.com/2013/02/17/business/in-china-families-bet-it-all-on-a-child-in-college.html?pagewanted=all&_r=2&

7. Alex Usher and Jon Medow, "Global Higher Education Rankings 2010," *Higher Education Strategy Associates* http://www.ireg-observatory.org/pdf/HESA_Global_Higher_EducationRankings2010.pdf

8. "Employment and Labour Markets: Key Tables from OECD," *OECD* http://www.oecd-ilibrary.org/employment/youth-unemployment-rate_20752342-table2

9. "Global Employment Trends for Youth 2013," *ILO* http://www.ilo.org/global/research/global-reports/global-employment-trends/youth/2013/lang--en/index.htm

10. Greenstone and Looney, "Regardless of the Cost, College Still Matters," *The Hamilton Project*

11. Michael Greenstone and Adam Looney, "Is Starting College and Not Finishing Really That Bad?," *The Hamilton Project* http://www.brookings.edu/blogs/jobs/posts/2013/06/07-return-to-some-college-greenstone-looney

12. "OECD (2013), Education at a Glance 2013: OECD Indicators," *OECD Publishing* http://dx.doi.org/10.1787/eag-2013-en

13. Graphic reprinted with permission from Greenstone and Looney, "Is Starting College and Not Finishing Really That Bad?," *The Hamilton Project*

14. "Not Open for Business," *The Economist* http://www.economist.com/news/business/21587778-americas-engines-growth-are-misfiring-badly-not-open-business?fsrc=nlw|hig|10-10-2013|6772701|37726496|

15. Graphic retrieved from "OECD (2013), Education at a Glance 2013: OECD Indicators," *OECD Publishing*

16. *Coursera* https://www.coursera.org/about/community

17. "Major Players in the MOOC Universe," *The Chronicle of Higher Education* http://chronicle.com/article/Major-Players-in-the-MOOC/138817/ Copyright 2013 The Chronicle of Higher Education. Reprinted with permission.

18. Orio Giarini and Mircea Malitza, "The Double Helix of Learning and Work," *Bucharest* http://unesdoc.unesco.org/images/0013/001307/130713eb.pdf

19. Carmelo Cipolla, "2013 e-learning trends," *KnowledgeOne* http://www.knowledgeone.ca/blog/post/2013-e-learning-trends.aspx

20. *Coursera Blog* http://blog.coursera.org/post/29062736760/coursera-hits-1-million-students-across-196-countries

21. Geoffrey A. Flower, "An Early Report Card on Massive Open Online Courses," *The Wall Street Journal* http://online.wsj.com/article/SB10001424052702303759604579093400834738972.html?KEYWORDS=MOOC

22. "ACE to Assess Potential of MOOCs, Evaluate Courses for Credit-Worthiness," *American Council on Education* http://www.acenet.edu/news-room/Pages/ACE-to-Assess-Potential-of-MOOCs-Evaluate-Courses-for-Credit-Worthiness.aspx

23. "ACE to Forge New Ground in MOOC Evaluation and Research Effort," *American Council on Education* http://www.acenet.edu/news-room/Pages/ACE-to-Forge-New-Ground-in-MOOC-Evaluation-and-Research-Effort.aspx

24. Steve Kolowich, "American Council on Education Recommends 5 MOOCs for Credit," *The Chronicle of Higher Education* http://chronicle.com/article/American-Council-on-Education/137155/

25. Steve Kolowich, "A University's Offer of Credit for a MOOC Gets No Takers," *The Chronicle of Higher Education* http://chronicle.com/article/A-Universitys-Offer-of-Credit/140131/

26. Joanna Normoyle, "UC Davis Badges," *Presentation at World Academy Forum on Global Higher Education* http://www.worldacademy.org/files/UCB/UCD_Badges_J.Normoyle.pdf

27. *Partnership for 21st Century Skills* http://www.p21.org/overview

28. Data adapted from Mohammad Qayoumi and Kim Polese, "Reinventing Public Higher Education: A Call to Action," *San Jose State University* http://www.sjsu.edu/president/docs/reinventinghighered_full.pdf

29. "WAAS Manifesto," *World Academy of Art and Science* http://www.worldacademy.org/content/history