Higher Education institutions have been the subject of persistent criticism and calls for change in the past decade. The voices calling for change have dramatically risen in the past five years driven by a confluence of factors ranging across technological, economic, scientific, and cultural aspects of society and education. The technologies of creation, validation, and distribution of knowledge have reduced the real or perceived monopoly that educational institutions had; this, combined with rising tuition and timid job markets, has further called for the reevaluation of the return on investment—economic and otherwise—of a college degree; recent advances in human psychology and the science of education have shaken some deep foundations of the current educational system; finally, we are witnessing a deep cultural shift from a focus on secrecy, and individualism to one on openness and communities; our educational institutions are still operating under the old cultural norms. While the calls for change point to the need for a revolution rather than incremental evolution, they have not succeeded yet in overcoming the legendary conservatism and resistance to change of Academia. In this paper we review the main factors driving the call for revolution and discuss the challenges to realizing this revolution at the scale needed.

1. Re-examining the role and mission of the University

Dual Mission
Throughout their history, American Universities and colleges have been balancing between the two complementary missions of serving as an economic development engine on the one hand and as the sanctuary for the pursuit of truth and higher order scholarship on the other hand. The Morrell Land-Grant Act of 1862 illustrates this duality by dictating a mission to educate: “without excluding other scientific and classical studies” to teach “agriculture and the mechanistic arts”. The mission of the university as an economic engine focuses on the immediate needs of society. It trains and educates a workforce prepared to solve contemporary problems, drive the economy, and fulfill the needs of society. The mission of the university as the steward of scholarly pursuits provides the necessary space for deep and unbounded exploration. It nurtures humans’ deep hunger to understand the world we live in and the curiosity to explore alternative theories, concepts, and universes. Harvard President Drew Faust (Faust, 2010) warns against focusing too much on the economic mission: “An overly instrumental model of the university misses the genius of its capacity. It devalues the zone of patience and contemplation the university creates in a world all but overwhelmed by stimulation. It diminishes its role as an asker of fundamental questions in a world hurrying to fix its most urgent problems. We need both.”

1 Last update on 11/5/13
Apart from the continuous tension between the two missions of the university, some of the premises underlying each of the two missions and the dichotomy between them are being increasingly challenged by a changing environment.

From Dichotomy to Harmony

In his book *Out of Our Minds*, Ken Robinson (Robinson, 2011) argues that both missions of the university are being ill-served. He notes that the current system has failed to adapt to the 21st century and is preparing graduates for the labor markets of the past and cultivating intellectual abilities as they have been defined in a distant past. Indeed, the whole educational system bears very strong marks of serving the industrial labor market of the 19th century and reflecting the values of the enlightenment period. Industrial markets were characterized by lifetime careers in stable and narrowly defined professions. The enlightenment culture elevated quantitative “rational” reasoning at the expense of other talents and sensibilities. An educational system at the service of both succeeded by selecting the “right” type of talents in students and devalued and suppressed other talents and sensitivities. Because the assumptions and values have been embedded in every aspect of the educational system, correcting this state of affairs cannot possibly be done through some incremental tweaking. Nothing short of a complete overhaul of the structure, culture, and practices will have the desired impact. This is a complete revolution rather than a corrective evolution.

From the Encyclopedia Era to the Wikipedic Era

Another foundational premise of the traditional education system is the idea that universities are the ivory towers where knowledge is created, guarded, and transmitted (Walker, Golde, Jones, Conklin-Bueschel, & Hutchings, 2011). This notion of authority and exclusion has been the face of higher education imparting its faculty authority and privilege. The economic model of the education system is based on the premise that knowledge is scarce, access-restricted, and slow changing. This is the Encyclopedic Era culture. With the now ubiquitous access to information, the increasingly democratic and distributed process by which knowledge is created, debated, and shared, we enter the Wikipedia Era. Knowledge is no longer seen as the exclusive realm of “academic experts”. This change in the stronghold on knowledge and information may be one of the deepest disruptions to the role that faculty and universities are called to play in society.

In his book *Imagining the University*, Ronald Barnett (Barnett, 2013) calls for a shift in view of the added value that a University brings to society and to students. Universities can no longer tie their identity to the safeguarding and access to information; instead what they bring is a “bounded and structured environment that allows for unlimited agency to build and experiment with things within those boundaries. It is the combination of the two [unlimited access to information and bounded structured environment] and the interplay between the two that makes the new culture of learning so powerful.” Barnett’s conclusion is far from being pessimistic; instead, it is a call for a more open and imaginative approach to the contemporary university, an approach that has not emerged yet “The university has come to be characterised by a poverty of imagination about itself and its own possibilities.” This is a challenge to all of us to participate in imagining and creating the new university.

From Work-centric to Human-centric

One of the issues with the economic mission of the universities is that too often it shadows a much bigger and higher purpose. In his book *Excellence without a Soul* (Lewis, 2006), Harry Lewis, former dean of Harvard College (undergraduate students’ affairs) writes, “Universities have forgotten their larger role for college students.... Rarely will you hear more than bromides about personal
strength, integrity, kindness, cooperation, compassion, and how to leave the world a better place than you found it.” Ken Robinson (Robinson, 2011) echoes this sentiment. He describes the role of education as three-fold: develop individual talents and sensibilities (individual), deepen understanding of the world (cultural), and provide skills to earn a living (economic). It is essential to keep an eye on all three and promote them equally. Understanding how they interconnect is paramount to transforming the education system of the 21st century. Any new educational system must cater to all three facets at the same time. This requires, among other things, that we debunk old myths and artificial boundaries that underlie the current system. An education addressing all three aspects cannot fit within the boundaries that underlie the current system. Tony Wagner (Wagner, 2012) attributes the inadequacies of the current system to the changing dreams and aspirations of the new generations of students. They are more focused on making a difference than on making money; they are deeply worried about the future of the planet, and seek healthier and more thoughtful lifestyles. In other words, they are aspiring to a better life much more than they are aspiring to a “good job”. This puts them at odd with parents, teachers and schools who still reward the old school behaviors of deference to authority. If you can get them engaged, the results are extraordinary; we don’t always know how. They want to know what they are contributing, they insist of seeing the larger significance of their work. Managing and motivating this cohort of young employees, the innovation generation, is as overwhelming and frustrating to us as it is to them. All of the tools and techniques we have learned in the best business schools are ineffective at best.

2. Return on Investment from College Degrees

What used to be seen as a privilege reserved for the select few who are exceptionally “gifted” or who can afford it, has become a necessity. The National Center for Public Policy and Higher Education, established in 1998, has been tracking Americans’ attitudes towards Higher Education. In their 2009 report, they found that the proportion of individuals who believe higher education to be “absolutely necessary” for success increased from 31% in 2000 to 55% in 2008². Data from the 2011 U.S. Census Bureau is consistent with this perception. The average earning of a person with a Bachelor Degree is double that of a person with a High School diploma. Americans see a college degree as a necessary ingredient to securing a comfortable lifestyle. At the same time, the percentage of Americans who see access to Higher Education as an issue has dramatically increased in the recent past. More than two thirds of Americans (67 percent) are now saying that access is a problem, the highest documented level since the National Center for Public Policy and Higher Education has started tracking these trends. This conflict between the perceived necessity of a college degree and (perceived) elusiveness is felt even more keenly by minority members of the public.

The Access Question

We often think of access as synonymous of affordability, yet there is a much larger issue: that of being prepared for and being admitted in a program of choice. If the purpose of education is in part to deepen one’s understanding of the world and to develop talents and sensitivities (Robinson, 2011), then it is a necessity for all youth, irrespective of their chosen career. All too often we are still operating under the assumption that selecting the few whose talents and inclinations fit the traditional mold of education and who have been adequately prepared is an adequate and efficient approach to serve society. The Finnish k-12 system of education is the best illustration of a system built on different assumptions. The most prominent feature of the Finnish school system is the extent to which it is driven by a focus on access. Indeed, 93% of the students graduate from high school and 66% go to college. An

² http://www.highereducation.org/reports/squeeze_play_09/report.shtml
important reason behind their success is the belief that every student is special and may need customized attention; indeed 30% of students receive “special education” during their first nine years of school. There is no stigma behind special education and no notion that it is permanent. Students navigate fluidly in and out. Special education is used to cater to students who fall behind as well as students who are outperforming and getting bored. Subsequently, one of their remarkable achievements is that the difference between the achievement of the “weakest” student and the “strongest” student is the smallest in the world. Similarly, the difference in achievement between different schools is also the smallest in the world (Sahlberg, 2011). Overall, their schools perform equally well irrespective of the economic, social, and other circumstances of the student (e.g. language spoken at home).

To put the Finnish data in context, we examine some similar metrics in the US: The level of education in the US has risen steadily over the last 70 years. In the 1940 Census, 24.5 percent of people aged 25 and over had at least a high school diploma. In 2008, 85 percent of this group had at least a high school diploma, and 27.7 percent had a bachelor’s degree or higher. In addition, 10.2 percent of people aged 25 and over had advanced degrees. (US Census Bureau, 2011)

While the Finnish school system has been successful at completely leveling the field for all students, this remains a major challenge for us. In the report titled, Preparing the Next Generation of STEM Innovators (National Science Board, 2010) the National Science Board identifies three major areas where focused attention is essential; one of the three recommendations is to “Cast a Wide Net to identify all types of talents and to nurture potential in all demographics of students. To this end, we must develop and implement appropriate talent assessments at multiple grade levels and prepare educators to recognize potential, particularly among those individuals who have not been given adequate opportunities to transform their potential into academic achievement.” The report recognizes that differences in students are in part a reflection of the preparation they have received rather than an inherent shortcoming.

The Nature of the Return

As can be seen from the US Census data, a College degree is increasingly becoming an expectation and a necessity. While reports show that on average such a degree doubles earnings over a high school diploma should not divert from the question of the nature of the return from such a degree. Indeed we must keep sight of the fact that the doubling of the earnings is as much a reflection of the graduate’s intellectual and personal growth as it is a direct measure of readiness for a specific job description. In fact, what is increasingly apparent is that much of the technological knowledge gained during undergraduate studies will be obsolete or irrelevant in much of the graduate’s career. This has caused many educational thinkers to call for a greater focus on creativity and innovation and a focus on a broader liberal arts education. In his book The Earth is Flat (Friedman, 2007) states, “Those who have the ability to imagine new services, new opportunities … are the new untouchables. Those with the imagination to invent smarter ways to do old jobs, … will thrive.” Tony Wagner (Wagner, 2012) concurs that innovation is the most important skill youth will need in the future. He contends that creativity is a skill that is central to being a human; schools must cultivate and nurture it. Instead, the educational system pounds it out of us so effectively. A broader general and liberal arts education is central to creativity and innovation. Literature for example is an exercise in empathy and in viewing the world from other’s eyes. The study of world history broadens students view and illustrates the fact that
multiple universes and possibilities can and did exist. The study of the arts allows them to create and experiment with abstract ideas and languages. All of these are essential for creativity and innovation.

The Economic Model
Some of the pressure of the return on investment for universities comes from the pressure from MOOCS and from the culture of free. Digital storage and communication have introduced a whole panoply of goods and services whose cost is “too cheap to meter” to use the expression of Chris Anderson (Anderson, 2009). This has created a whole economy around free products where people will enjoy the free services and products and some of them will pay for additional services or for access to other consumers. Google is one of the leading companies who have embraced the concept of free and found ways to redefine the market and make money from free. The emergence of MOOC and Khan Academy are the unmistakable signals that sooner or later universities will have to compete with free. The sooner they start creating a new economic model the better.

3. The Science of Human Learning and Human Motivation
Recent developments and findings related to human motivations and learning have raised questions about many of the assumptions that have underlined the educational system for centuries. Indeed, the whole educational system is built around teaching which is seen as necessary for any learning to occur. This hypothesis was turned over its head by multiple experiments on humans and other primates. What these experiments have shown is that humans are wired to learn. They have a hunger to learn and a drive to experiment and play that are innate and need to external motivators or stimuli (Pink, 2009). Paradoxically, schools have succeeded in inhibiting rather than nurturing these natural drives. As the radical “Hole in the Wall” and “school in the cloud” experiments by Sugata Mitra3 show, in fact, we learn best without teaching.

Traditional schools have assumed that students needed external stimuli and motivations to do well. A complete system of rewards and punishments has been an integral part of the educational system; grades are the most ubiquitous aspect of this. Research on human need for self-determination and mastery has shown that external motivators are not only un-necessary but often counter-productive (Deci & Ryan, 2013). Several of the classes designed and taught at Olin College have been crafted and refined around the balance between students’ need for autonomy and sense of self-efficacy (Vanasupa, Stolk, & Herter, 2013)

Because the current system was developed during the industrial era, its tacit goal is to teach and transmit as much knowledge as possible as fast as possible. Standardization is a reasonable way of doing it and testing is a reasonable way of measuring it. Such view is reductionist of human potential and individuality; such approach has for too long stifled diversity and discouraged creativity. Such approach also assumes a fixed mindset and fixed potential in students. Carol Dweck (Dweck, 2006) has extensively illustrated how students’ mindset affects their performance and their capacity to learn. Furthermore Dweck shows that students can actually learn and be trained to shift from a fixed (I am smart; I am not good in subject X) to a growth mindset, and thus grow and learn.

A school system built on the premise that test scores will select the “right” students is built on the assumption of a fixed mindset. A dramatically different approach is needed. Philosopher Barnett (Barnett, 2013) captures the new vision as “bounded and structured environment that allows for unlimited agency to build and experiment with things within those boundaries. It is the combination of the two [unlimited access to information and bounded structured environment] and the interplay between the two that makes the new culture of learning so powerful.” Boundaries spur the imagination to become more active in figuring out novel solutions within the constraints or context.

3 http://www.ted.com/talks/sugata_mitra_build_a_school_in_the_cloud.html
The quality of education has traditionally been measured by the standards that students need to meet. “Raising the standards” has often been seen as the solution to all educational ails. Students are seen as imports into the educational culture. They either adapt or leave. This view has failed too many students. The alternate view is that the students, the faculty, and the environment adapt to each other, change each other, and learn from each other. They are the culture. A learning environment that cannot accommodate all students is a failing environment.

Finally, the current educational system is built on the premise that a successful graduate is one who can solve mono-disciplinary problems alone. This is indeed how we credential students, by isolating them, and testing them. With the focus on solving well defined problems that have a unique solution, students are discouraged from asking open-ended and significant questions and shy away from taking risks. These are the very activities that students need to be trained in and encouraged to perform if they are to succeed in a changing world. Most, if not all, problems students face in college are mono-disciplinary. The whole culture of education is compartmentalized. This prepares them very poorly for a world where most problems they will face will call for a multi-disciplinary approach and solution. Most of the time innovation happens at the boundary between disciplines. The current educational system has for too long focused on individual and competitive performance at the expense of team work and collaboration. This prepares them poorly for a world where communities and teams are the source and locus of all innovation and creativity.

4. Challenges to addressing these issues

Even with the overwhelming converging evidence that Higher Education needs to radically change the way it conducts its business, higher education institutions, especially the most prestigious ones remain resistant to change; radical change is not part of their DNA. It is no accident that the most spectacular successes and the only credible transformative alternatives have emerged from independent, new institutions or units rather than from reformed pre-existing ones. Olin College is such an example; it was created with the deliberate intent to recreate the whole system from scratch with no baggage and no existing traditions or administrative structures weighing it down. The more radical are the changes the harder it is to do it within an existing context. The College of Technology at Purdue is well positioned to provide the safe heaven where bold and ambitious experiments can take place.

References


