The Case for Exposing Every Student to Entrepreneurship

Roy C Carriker, Phd, MBA
Drexel University Close School of Entrepreneurship

With student debt at$1.3 trillion, 41 – 46% of recent US college graduates say they didn't need a degree for the job they were able to get, implying roughly $550billion of unproductive education investment didn't prepare them for the realities of earning a living now and in the future. Rapidly changing patterns in the ability to earn an income in the future and their causes are examined. The critical need for competitive productivity in a globalized world is driving workplace technological innovation replacement of human endeavor. A case is made the basic elements of entrepreneurship and the skill set valuable to entrepreneurs should be taught to every student to better enable them to earn a future living in an employment environment vastly different from the past. Today's students will have to be entrepreneurial in the pursuit of their lives whether or not they ever start something.

FOREWARD

The concept of a job, i.e., earning a living, is dramatically changing. Accelerating global competition is driving business to be ever more productive to survive. In this drive, business is redefining employment, facilitated by new technology, automation, off-shoring, the Internet, and recently, with particularly dramatic advances in information technology and artificial intelligence. In the span of just several decades typically earning a living has gone from working for a few employers over a lifetime and receiving retirement income from one or two to having many employers over a working lifetime with no meaningful accumulation of employer provided retirement benefits. However, even this is now in flux. A growing employment phenomenon is people requiring multifaceted employment to make a reasonable living. An example would be working part-time, supplemented by work assignments arranged by intermediary agencies.

Entrepreneurship on a broader scale would facilitate future wage earning possibilities. However, many opine entrepreneurs are born not made, thus educating all students toward an entrepreneurial mindset wouldn't be productive. Recent examination suggests there is a lack of evidence supporting this "conventional" wisdom. Experience in the Drexel Close School of Entrepreneurship suggests exposing students to entrepreneurship shifts their perspective to a more entrepreneurial mindset.

What follows herein details accelerating shifts occurring in employment patterns pointing to why it is absolutely critical students facing long careers must be made aware of these shifts and be prepared to be more entrepreneurial as a "habit of mind" to improve the odds of earning a satisfactory living in the future whether or not they ever plan to start something. Having "deep" knowledge in an area of a student's interest, i.e., field of study, such that they can recognize real market needs in that arena, combined with a knowledge of entrepreneurship (the process) and an understanding of being an entrepreneur (the individual), can greatly enhance a student's probability of career success. In turn it follows a strong case can be made for cross-curricular academic programs involving major fields of study combined with a

basic understanding of entrepreneurship and being entrepreneurial. A critical aspect of generating these cross-curricular programs to prepare all students is raising general educator awareness to realities facing today's students in earning a living over their lifetimes and how these students might be better prepared.

THE EMPLOYMENT LANDSCAPE EVOLUTION

Since the global financial meltdown in 2008 developed economies have struggled to return to a path of prosperity. This is particularly true for wage earners in middle and lower income families and for students entering the workplace. The populist view is the economy has been through a difficult struggle, but now developed economies are beginning to show signs of a return to growing prosperity and life as it was prior to 2008. However, mounting evidence suggests this will not be the case. Companies changed their structure and conduct with respect to labor utilization in driving to greater productivity, particularly with respect to off-shoring to achieve lower labor costs. Accompanying this there have also been significant advances in job replacing technologies such as automation and robotics. Further, technological advances in areas such as Artificial Intelligence are now broadening the potential to replace previously productive humans in the quest to lower costs. There is already a job crisis for many recent university graduates and a troubling underemployment of university degrees.

In his essay "Economic Possibilities for Our Grandchildren", John Maynard Keynes expressed concern about labor being replaced by technology more rapidly than new uses could be found for the displaced labor. Today this has clearly happened as noted above, causing great disruption in middle class families' ability to maintain their standard of living.

An example of the continuing march of labor replacing technologies, driverless vehicles are on the horizon in the next few decades. How many now making a living driving will be displaced? With the potential 24/7 utilization of vehicles, will vehicle manufacturing and the supporting industries shrink significantly? What will be the labor impact? Another example in a completely different arena is the explosion in information technology and artificial intelligence. It is predicted solid careers held by university educated knowledge workers who use data and set decision rules such as accountants, auditors, structural engineers, etc. risk being seriously impacted by intelligence automation.

Temporary Workers – Evolutionary Step One

Before post WW II globalization began to have an impact, firms typically were permanently staffed to meet the peaks in demand. If a peak was too severe, they used overtime with the existing workforce. As globalization increased pressure to become more productive, firms began using temporary workers rather than permanent employees to handle peaks in the business cycle. These workers generally had a lower wage and there were no costs of benefits such as healthcare and retirement contributions, making their use economically attractive. This was so successful it led to the formation of a major global industry to provide temporary workers with the emergence of players such as Manpower and Adecco SA.

Outsourcing Complete Functions – Evolutionary Step Two

Continuing pressure to become ever more productive caused firms to rethink how they were staffed with respect to non-core competencies. Thus an engineering firm might decide accounting, legal and human resources are not really core to their business, and outsource these competencies. Outsourcing of complete functions began to get traction, although only on a local basis at first, limited by information and communications technologies. The advent of the Internet coupled with IT advances made it possible to offshore complete functions to lower wage and overhead economies, further lowering costs and improving a firm's profitability. With this groundwork in place it might not be too surprising outsourcing virtually all the functions of a firm would follow.

"The Spider/Provider" – Outsourcing In The Extreme – Evolutionary Step Three

The confluence of globalization, information technology (IT) and the Internet created unrelenting pressure on firms to continuously improve productivity, leading to significant changes business structures

and practice. Two key elements of these changes are outsourcing and supply chain management, which used in the extreme leads to changes in the structure and conduct of the firm. Observable trends suggest these changes are leading to a significant new form of the firm of the future, we'll call the '*spider/provider'*, discussed below.

Historically a vital aspect of a firm was to organize labor, i.e., its employees, and processes *within* the firm to compete and satisfy customer needs. Managing the firm had a strong *inward* looking component for success. However, today new forces afoot are driving firms and their management to look more and more to resources *outside* the firm, *'*producers*',* to successfully compete. To be successful means managing these resources even though one does not control them. In a paper, "Toward a New Theory of the Firm", presented at the 2006 Wharton SEI Center for Advanced Studies in Management annual meeting, Paul Kleindorfer *et al*. recognized a new emerging type of firm which orchestrates the provision of goods and services for its customers through its facility in coordinating a network of firms and external capabilities using Information Technology (IT) and the Internet. A firm's revenues per employee can grow dramatically, driven by '*orchestrating'* resources external to the firm. This model even extends well down to a 'company-of- one', where firms of one or a few individuals can be important players in future markets.

Driven by the intersection of information technology, globalization and the Internet creating unrelenting pressure for improved productivity, a new and growing form of the firm, the *spider/provider*, is evolving utilizing outsourcing and supply chain management to extremes not previously witnessed. A spider-provider is like a *spider* sitting on one node of the World-Wide-Web using the Web and information technology to create its goods and services for customers. It accomplishes this by *orchestrating* the outputs of other nodes (companies and individuals) on the Web, the *producers*. Since the producers can be anywhere on the globe and spider/providers are driven to lower their costs, they have the potential of negatively impacting the higher cost employment of developed economies by seeking lower cost producers elsewhere.

Using the Internet and IT to coordinate producers in the provision of its goods and services, a spider/provider can achieve competitive advantages though incredible flexibility in capacity, delivery time, product offerings, etc. Further, a significant market presence can be established by a new firm without raising traditional amounts of capital for facilities, equipment, working inventory, etc. These principles can even be extended to a *company-of-one* (or a few). Sustained competitive pressure will likely cause all firms to evolve to some degree toward this emerging new model, the spider/provider. While jobs will still exist to accomplish the work to be done, the work will be distributed in a different manner, primarily through unprecedented outsourcing.

Two prime examples of the power of the spider/provider model are Li & Fung and Vizio. After WW II, Li & Fung, a century old trading company, moved to Hong Kong and transformed itself into a manufacturer of low end consumer goods such as toys and clothing. Led by Harvard educated Victor and William Fung, the firm transformed itself into a spider/provider. Enabled by the internet and information technology, Li & Fung became a virtual manufacturing company, annually providing several billion apparel and consumer goods items with a value of over $15 billion to their customers, including many top brands. The term "virtual" is used because they accomplished this without owning factories, but rather through a staff of 24,000 operating across 45 countries using the power of the Internet and IT to orchestrate the efforts of more than 12,000 suppliers, each with their own role in producing a final garment from weaving and dying to zippers, buttons, sewing, etc.

Capacity can essentially be varied instantaneously by how many suppliers with available incremental capacity and pre-qualified capabilities are turned on/off. The remarkable speed and flexibility in capacity afforded by this orchestration makes it difficult for a traditionally organized manufacturer to compete. In addition, by using the marginal capacity producers already have in place, the producers enjoy greater margins which can be shared with the spider/provider in terms of favorable pricing. The full Li & Fung story can be learned from *'Competing in a Flat World'* (Fung, Fung, Wind, 2007).

Another spider/provider example is Vizio, the flat panel TV brand started by William Wang, a Silicon Valley entrepreneur, who saw flat panel televisions as a huge opportunity. In 2002 he formed a company

with two other persons and in 2003 they launched the Vizio brand. Wang's objective was to become the number one provider of LCD flat panel TVs in the United States, which according to an October 2009 *Wall Street Journal* article was achieved approximately 6 years after Vizio was formed, surpassing giants such as Samsung, Sony, Philips, Panasonic, etc. with a 21.7% market share. Amazingly, with sales in excess of $2 billion, Vizio still only had on the order of 140 employees whose jobs were to orchestrate vendors in every aspect of bringing flat panel televisions to market as well as providing aftermarket product support.

A very valuable aspect of the spider/provider model is its highly efficient use of capital. The spider/provider utilizes the capital investments already made by the producers to create their own goods and services thereby minimizing the capital the spider/provider must raise in bringing their enterprise forward. Having to raise less capital can translate to greater retained ownership by an entrepreneur in a startup. Further, as previously noted, the model has the potential of improving the return on capital invested by the producers through higher capacity utilization.

Even an individual can use this approach. In his book *The World Is Flat*, Friedman tells of a friend who had a successful specialized graphic arts and commercial photography business with over 40 employees representing a broad skill set. The friend was shocked when he lost an important multifaceted job for a good customer to a 'person', i.e., a company-of-one, who evidently orchestrated all the capabilities needed.

From the Li & Fung and Vizio examples we see emerging two kinds of firms; 'spider/providers' and 'producers'. Firms such as Li & Fung and Vizio are the spider/providers using IT and the Internet to orchestrate firms (the producers) to produce goods and services. As the global employment market is now evolving we see "producers" may even be contracted individuals with specific knowledge or skills and this phenomenon is rapidly growing. The power of IT makes it possible to outsource programs and projects to temporarily assembled teams and/or individuals. This growing phenomenon again requires more entrepreneurial skills to be successful in the workforce of the future.

Part-Time Temporary Employment – Evolutionary Step Four

Part-time employment has become an important element of temp employment whereby a temp worker (non-employee) isn't hired on the basis of working forty hours a week for weeks or months at a time, but rather on a just as needed basis, for example, 4 hours/day Tuesday-Thursday, 6 hours on Friday and 8 hours on Saturday. Many mall retail clerks work in such arrangements. More and more people in the workforce have to rely on combinations of such arrangements to eke out a living. Due to the fact many temp jobs are only part-time, workers find they must juggle more than one temp job at a time to make a living, creating even greater labor market "churn".

The Sharing Economy – Evolutionary Step Five

Today there is a growing phenomenon in self-employment, which is certainly entrepreneurial, but not yet likely captured in employment statistics resulting from what is termed the "sharing or shared economy", or sometimes referred to as the "mesh" economy. A new form of firm which connects peer-to-peer transactions has leapt into prominence with firms such as Uber, Lyft, Airbnb, etc. Principal characteristic of the sharing economy are peer-to-peer transactions in sectors such as travel, accommodation, car sharing, etc. Precursors to the rise of firms such as Uber were accommodations reached between individuals on Craigslist, eBay, etc. Today the success of Uber, et. al. is driving all sorts of new entrants into this arena, including new peripheral players which support the principal ones.

From an economic efficiency standpoint, the sharing economy is very interesting because it creates more efficient utilization of underemployed assets. People who have time to provide rides use their time more productively, people who have a spare room in their apartment make better use of their investment in that apartment, and so forth. In fact, the sharing economy gives rise to the possibility of a new version of the *company-of-one,* discussed later.

A sharing economy company-of-one might be best exemplified by describing this new class of entrepreneur. Imagine an RN who drives for both Uber and Lyft, takes temporary nursing care

assignments he/she finds interesting from a service providing such arrangements, and rents out a spare bedroom in his/her condo using Airbnb. Through this arrangement this individual acts as a multifaceted service provider (company) and may be doing quite well as an individual entrepreneur, but isn't fully captured in any specific wage earning or business statistic.

It is difficult to imagine just how far the sharing economy will evolve. However it does seem to be an exploding phenomenon and entrepreneurs are coming forward with new ways to cost effectively provide goods and services, providing potential competitive alternatives for established service providers such as FedEx, UPS, hotel chains, city-to-city transporters, etc. However, one must ask, if the economy was near full employment in the traditional sense, would the shared economy even exist, or is it the result of massive under-employment in developed economies?

The Self-Employed Entrepreneur – *a company-of-one spider/provider* – Evolutionary Step Six?

So going global, outsourcing, becoming more web-centric appears to trend toward a company having fewer employees for a given volume of business than a more traditional firm. The ultimate indivisible in this chain is a '*company-of-one*'. Information technology and the internet greatly facilitate an individual's ability to conduct business as a company-of-one, carrying with them an identity (website and other) as a self-employed provider of specific goods/services. Companies-of-one are becoming ever more prevalent as producers for the spider/providers and as temps or contract knowledge workers.

The US Census Bureau maintains statistics on 'Non-employer Firms', which they define as self-employed individuals operating very small unincorporated businesses, which may or may not be the owner's principal source of income. They track the number of such firms as well as their revenues from information provided by the IRS. Non-employer Firms continued with steady linear growth in number from the pre-internet age until about 2002 when there was definite upward deflection. Netscape became the first practical internet tool around 1995. One can speculate it took about seven years for the internet to gain traction in terms of becoming a facilitator of self-employment and the upward deflection in growth rate was an Internet effect. By 2007, before the global financial crisis, the number of such firms reached 21.7 million, up nearly 41% from a decade before. Since a number self-employed may not be reporting revenues to the IRS, the actual number could be much greater than 21.7 million. Indeed, the *Wall Street Journal* estimates the number of self-employed in the United States to be more on the order of 40 million. If this estimate is accurate, essentially one quarter of US workers are now self-employed and could be considered entrepreneurs.

The trend to greater self-employment can already be recognized in knowledge workers working as independent contractors in consulting, IT, engineering, accounting, law specialties, etc. Outsourcing reinforces this trend and firms are finding hiring independent expertise on an as needed basis is not only more cost effective than maintaining an in-house capability, but the level of expertise is greater than can be afforded on a full time employment basis. Further, the costs of a mistake in hiring (severance, potential suits, outplacement, etc.) can be avoided in utilizing independent contractors. Part of this growing trend is the emergence new Internet based business facilitators like oDesk. oDesk connects businesses having a specific requirement, for example a new website design, with individual independent contractors capable of doing the job, not only facilitating the connection, but also managing the client/contractor transaction.

WORKPLACE IMPACT OF THE EVOLUTION

For many recently graduated University students the jobs crisis is already here. Students in the US are not only saddled with record student loan debt exceeding $1.3 trillion, for the first time in history surpassing credit card and auto loan debt, but they are also unable to find the good paying jobs they expected when pursuing a university education, exacerbating the ability to repay their debt.

As early as 2008 the US Bureau of Labor projected students entering the workforce would on average have 10 to 14 employments by the age of 39. Since that time the picture has continuously darkened. In 2011 about 1.5 million, or 53.6%, of bachelor's degree holders under the age of 25 the prior year were

jobless or underemployed. In 2013 for college graduates between the ages of 20 and 24, nearly 4 out of 10 were underemployed. A recent Gallup study reported by the WSJ found 41% of recent US college graduates said they didn't have to have a degree for the job they were able to get, i.e., they're underemployed. Supporting this, the Federal Reserve Bank of New York reports as of June 2015 34.6% of all college graduates and 46% of recent graduates ages 22 to 27 were underemployed. Similarly, in the UK the Financial Times reports as of 2012 17% of recent UK university graduates were unemployed and 36% were underemployed, up from 27% in 2001. While underemployment has suppressed salaries in recent history, median income for college graduates is around $48,000, while for high school graduates it is about $25,000, so although the level of underemployment is distressing, you're still better off having college degree if the debt load to attain the degree isn't too onerous. Further testament to the underemployment of university graduates, WSJ online recently reported 15% of taxi drivers in the US have a college degree up from less than 1% in 1970.

Certainly some of this displacement and pain can be put to poor advice and choices in selecting a career path through University. Not too long ago one established path to career success was to get a get a solid liberal arts education and find an entry level opening with a bank, insurance company, etc., where one would undergo one to two years of training in that field. However, today such firms new hire training programs have fallen victim to improving the bottom line and these firms now seek new employees with several years of experience. Another significant factor exacerbating recent graduates' career difficulties can be traced to: an accelerating evolution in the use of part-time and contract labor; the way companies are structured and conduct business; and finally, the rush of technology to supplant workers' jobs.

Labor Department data shows men out of work, both those who have stopped looking and those still looking for a job, has risen steadily from about 5% in the late 60's to around 18% today. Over the same time span the number of women with jobs has steadily risen to approximately 70%, while men with jobs have decreased to on the order of 82%. Some job loss for men can be attributed to women workers taking their place, but employment evolution has also taken its toll. From 1975 to the present the average inflation adjusted wage for men with less than a bachelor's degree (some college, an associate's degree, a high school diploma or less) has gradually declined. Even for male bachelor and advanced degree holders, inflation adjusted wages have had a downward drift for the past decade. These figures speak to a new reality with respect to holding a job and earning a living.

For several decades the use of temps has been on the rise in a push for lower labor costs and higher productivity, displacing what once were full-time jobs. Data from the US Bureau of Labor Statistics indicate the number of temporary employees rose by 29% between 2009 and 2012. A survey of the 200 largest companies found temporary workers represented on average 22% of their workforce, a figure which is growing with the use of temps now ingrained as part of corporate strategy.

Traditional firms are becoming ever more reliant on outsourcing functions once considered core to the firm. As early as January 2007 *The Economist* noted Manpower, one of the world's leading employment services firms, estimated for larger multinational firms the number of temporary employees had already reached nearly 20% of the workforce. Today it is estimated 30% of the US workforce is comprised of contingent or factional workers, growing to be 40% by the end of this decade. New online staffing services such as Elance are experiencing explosive growth with more than 1 million registered freelancers in 155 countries working for 250,000 active clients. Businesses of all sizes are posting 1 million jobs annually and are receiving 9 million candidates from Elance. More than 25,000 new freelancers and 7500 new businesses are signing up each week. A number of new online companies (LiveOpps, Elance, TaskRabbit, Mechanical Turk, etc.) are building platforms to aggregate human talent globally on a task-by-task basis.

Temp employment shadowed the downturn in employment during the recent worldwide economic downturn. In a December 2011 *Wall Street Journal* interview, Tig Gilliaim, head of Adecco SA's North America Group - a major temp organization, noted after this downturn in temp hiring there was a recovery in temp utilization. Further, he suggested the transition of temps to permanent employment may not occur as it has in the past due to the competitive need of companies to remain flexible and their

surprisingly satisfactory experience in using temps. With recovery, today's industry experience seems to support this view.

A Harvard Business Review article, "The Rise of the Supertemp", cited many advancing trends in the employment of management and professional temporary workers. Examples include:….2011 McKinsey research found 58% of US companies expect to use more temporary arrangements at all levels in the future…..MBO partners found 16 million Americans are working independently today with the figure expected to reach 20 million over the next two years…..According to Booz Allen Hamilton by 2009 revenue for placement of temporary managers in the UK reached as much as $1.8 billion and across Europe the market for temporary managers was growing more than 20% annually…..A new high-end temporary talent firm, Axiom, supplies temp lawyers to nearly half the Fortune 100, 650 temp lawyers accounting for 2012 Axiom revenue of more than $100 million, nearly tripling since 2008.

Several years ago articles began to appear on a surprising development in outsourcing, namely the outsourcing of R&D by such notables as IBM. A *USA Today* article noted P&G was near its goal of sourcing 50% of its new innovations from outside the company. The article went on to mention Innocentive, a website where companies offer up to a $100,000 reward to freelance scientists who can solve a company's technical problem posted on the site. Today it has been reported a reward payout has reached as much as $1million. The article further noted Boeing and BMW were opening design work to partner companies. As early as January 2007 a *Financial Times* article titled 'The billion-man research team' cited a number of instances of the growing trend in crowdsourcing R&D, an area once considered by most firms as too sensitive for outsiders' eyes.

The Economist reported the French cosmetics giant L'Oréal with an R&D staff of 2800 is being challenged by new global competitors such as Natura of Brazil. Natura has an R&D staff of only 150 acting as gatekeepers in sourcing R&D. This is allows Natura to make 40% of their revenue from products introduced in the last two years. A 2012 *Wall Street Journal* article noted the drug manufacturing giant AstraZeneca is now closing some research facilities and outsourcing more of its drug research, establishing what they call "virtual" units where small numbers of AstraZeneca employees forge research partnerships with small groups and scientists outside the company. They feel this allows for a lower and more flexible cost base and access to the best science available.

All the information cited clearly supports acceleration in changing concepts of employment and a job, driven by firms' changing structures and behaviors in response to global competition. While information technology and the Internet have been of tremendous benefit individuals, they have also been very instrumental in driving global competitive pressure on firms as well as enabling firms' responses to be ever more productive and competitive, including a much greater temporal approach to needed resources, including manpower and knowledge workers. The need for longer term relationships with employees is being supplanted by being able to identify and engage individuals with the requisite skills or knowledge on an as needed basis.

The workforce of the future must be prepared to be entrepreneurial with the attendant entrepreneurial skill set regardless of their career objectives because a significant portion of the future workforce, including managers, professionals, knowledge workers and even research scientists are projected to be contract workers operating through intermediaries such as Elance, Innocentive, oDesk, Manpower International, etc., or possibly as company-of-one independent entities with their own websites, etc. Further, jobs of the future are being likened more to what happens in producing a movie. Small teams of specialists and individuals are brought together to accomplish the production of the movie and then they disassemble to go on to other projects comprised of a whole new mix of players. Many foresee this is the way great deal of work will be accomplished in the future.

FUTURE IMPACT - THE EVIDENCE

Thus far we have seen four current major trends negatively affecting jobs in developed economies. First, outsourcing jobs has become commonplace and is growing, even down to contracting individuals with highly specific skills on a project by project basis. Second, firms are outsourcing complete functions,

not just specific jobs. Third, today's companies are becoming more like spider/providers, organizing more as program managers to produce goods and services, providing extreme flexibility to evolve and change as circumstances dictate. The pronounced flow of this jobs outsourcing is to lower labor cost markets

The fourth phenomenon is already being felt, but its impact will have an even more profound effect on jobs of the future, namely the ability of technology to further replace human endeavor. We have already witnessed this with respect to automation and robotics in manufacturing, distribution, etc. replacing labor, actually resulting in a higher level of quality and reliability. We're beginning to witness advances in information technology and artificial intelligence replacing university degreed knowledge workers. For a sobering view of the impact of artificial intelligence on future work go to www.youtube.com and watch "Humans Need Not Apply" by CGP Gray. A thoughtful discussion of the implications can be seen in a talk by Andrew McAfee: "What will future jobs look like?" at www.ted.com.

As reported in the Financial Times, experts from Google, Yahoo, AT&T, BT Group, Cisco and others attending the 2014 World Economic Forum in Davos, Switzerland presented a very bullish picture of what advances in artificial intelligence will be able to accomplish supplanting what humans now do. In concert with this bullish enthusiasm, Lawrence Summers, economist and former US Treasury Secretary, noted these advances in artificial intelligence may put at risk white-collar jobs in areas such as research and the service industries which weren't previously threatened by automation, etc.

A recently published briefing on the future of jobs in the Economist provides a chart from research by C Frey and M Osborne published in 2013 which supports Summers' concern. The chart presents the probability computerization will lead to job losses within the next two decades for various professions. Surprisingly, the prognosis was a 94% probability accountants and auditors would experience job loss in this time frame due do artificial intelligence. It appears any job/profession which works with input data and algorithms to provide answers such as many engineering tasks will be at risk. Thus Keynes was quite right in worrying about technology supplanting human endeavor and the ability to earn a living.

According to Andrew McAfee, management theorist at MIT's Sloane School who studies these issues: "Just in the past couple of years, we've seen digital tools display skills and abilities that…..eat deeply into what we human beings do for a living"; and "Within [our lifetimes], we're going to transition into an economy that….doesn't need a lot of human workers. Managing that transition is going to be the greatest challenge that our society faces."

Facilitated by advancing information technology, network-centricity, outsourcing, globalization, etc., constant pressure for improved productivity will continue to drive the employment toward the use of non-employee contract workers, with individual workers treated as a variable cost regardless of their specific skill level and utilized on an as needed temporary or contract basis. The old paradigm of long-term employment with the firm including benefits such as health care, time off, retirement packages and a gold watch is rapidly disappearing. The new paradigm requires a much higher degree of self-reliance. The traditional concept of an employee is eroding and a workforce of contract workers is evolving in its place. Understanding entrepreneurship and having the confidence to become one will enhance an individual's opportunities for success in this future workplace.

Many who study these issues suggest entrepreneurship is an important element in addressing this jobs dilemma since it can not only lead to self-employment, but the creation of firms which in turn create employment. Today entrepreneurship has become a business and economics buzzword. Many universities have rushed to shore up their course offerings through their business schools with course content *describing* entrepreneurs and entrepreneurship as a process, but with less focus on *creating* entrepreneurs who are not necessarily business majors but from all disciplines across a university.

Students and those facing long work careers must not only be made aware of the trends cited herein, but should endeavor to gain a basic understanding of entrepreneurship and the underlying personal skill set needed for even the most basic entrepreneur, i.e., the self-employed. Creating entrepreneurs certainly includes elements of business education, however, success goes well beyond simply providing knowledge, it goes to molding a person's mindset, personal skill set and confidence.

FIRST STEPS TOWARD SOLUTIONS

A very interesting 2009 study by the Kauffman Foundation using United States Census Bureau data looked at job creation as a function of company age. Their findings were very illuminating:

- Since 1980 nearly all net job creation in the US occurred in firms less than five years old.
- Without startups, net job creation for the American economy would have been negative in all but a handful of years.
- 2007 census data showed firms 1 to 5 years old accounted for roughly 2/3 of the jobs created.
- The net job creation year-to-year principally comes from three sources: startups; firms 1-5 years old; and the oldest (and largest) companies, creating a "barbell" in jobs created versus company age.

The Kauffman researchers suggest this barbell effect could be explained by the well-recognized dynamic of larger companies (thus older, taking time to attain size) fueling their own growth by absorbing startups and younger companies for their innovation and technology. Significantly greater exposure of students to entrepreneurship will likely create more entrepreneurial start-ups, thus creating more jobs. Further, individuals with an entrepreneurial mind set and skills are very likely more highly prized as employees by young firms, and thus exposure to entrepreneurship can be an important element in an individual's marketability where jobs are created.

Hart Research Associates recently released the results of a survey conducted on behalf of The Association of American Colleges & Universities. The survey involved business owners or senior management of 400 employers for which at least 25% of their new hires associate or bachelor degree holders. The survey also involved 613 college students. Among other things, the survey examined the importance of seventeen different college learning outcomes as ranked by both business executives and students. The good news……there was agreement between management and students on the six most important learning outcomes besides a specific major. These were:

- The ability to effectively communicate orally.
- The ability to work effectively with others in teams.
- The ability to effectively communicate in writing.
- Ethical judgment and decision making.
- Critical thinking and analytical reasoning skills.
- The ability to apply knowledge and skills to real-world settings.

While in order of importance the college students tended to rank these attributes a few percentage points lower than management, the agreement was amazingly good. However, the researchers found a large gap in the perception of how well-prepared students are in these attributes, with the majority of employers feeling colleges and universities need to do a better job of student preparation in these areas, whereas the majority of students felt they had received adequate preparation.

While no simple solution exists to the growing problem of underemployment of university graduates and individuals in general, certainly one starting point could be creating courses covering: 1) creating student awareness of the rapidly changing realities they will face in their working life times, and 2) introducing students to elementary concepts of entrepreneurship and the importance of the skill set important to entrepreneurs, but also important to them in improving their chances of earning a satisfactory living in the 5 or 6 decades they will likely have to work. This basic skill set includes written and oral communication, case method problem solving, negotiation, leadership/team building, personal finance, personal branding and video resumes.

The Drexel University Close School of Entrepreneurship has created a set of courses entitled Life Strategies which covers these areas, and while required for entrepreneurship majors and minors, Life Strategies is open to all undergraduate students in the University. In just over two years, non-entrepreneurship student enrollment across the University is such that their numbers are growing past entrepreneurship majors and minors, perhaps validating students' recognition of a need.

Conventional wisdom often opines “entrepreneurs are born, not made”, i.e., their psychological make-up is somehow special when it comes to launching a business because they are more insightful, uncertainty tolerant, willing to take risks, etc. Two Wharton professors, Peter Cappelli and Laura Huang, have surveyed the literature related to this question and report there is no strong research to support this conventional wisdom, and in fact there is some solid research refuting it. Further, being extroverted is often associated with entrepreneurial success. However, a recent WSJ Small Business article by Elizabeth Bernstein points to a number of sources refuting this point of view. So teaching students elements of entrepreneurship and raising awareness of the career importance of an entrepreneurial skills set can create great value toward their future earnings potential.

While many define an entrepreneur as someone involved in starting a business or organization, and entrepreneurship as the process thereof, a more appropriate definition might be an individual with the "habit of mind" to constantly explore the alternatives one faces in earning a living and making reasoned risk decisions with respect to one's choices. By example, someone in a long time job in a declining industry might consider preparing for a lesser paying job in a growth industry to improve longer term career prospects.

The Oxford Martin School at the University of Oxford is a world-leading center of pioneering research, debate and policy for a sustainable and inclusive future. In a recent seminar at the School experts presented findings on the susceptibility of future employment to automation and artificial intelligence. While they found many jobs in the future are vulnerable, their research indicated there are two areas which appear to be beyond the bounds of automation and artificial intelligence, namely creativity and social intelligence, i.e., the ability to interact with and/or persuade other humans. Interestingly, teaching came as one of the stronger career candidates in resistance to automation and artificial intelligence. Thus no matter the area of career interest, in making career choices one should look for those elements in their field which have the potential to bring greater creativity and social intelligence/interaction to the work. Detailed information on data presented at the seminar can be found at: https://www.youtube.com/watch?v=I3MqwwrPgsw#t=1356

The picture seems a bit bleak in terms of employment, however, work and jobs are still there but meted out in new ways and with much shorter durations. More than ever before, to improve the odds of being fully employed and thereby fully compensated, students need to make reasoned, researched decisions about how they invest in their time and resources in pursuing an education. An important option for every student to consider, no matter the student’s principal field of study, is to mix experiential learning in entrepreneurship with their career interest, potentially unlocking creative confidence to start something or be self-employed.

CONCLUSION

The concept of having a job and working for one or several firms over one's lifetime is rapidly coming to a close. Those earning a living in the decades ahead will see a much different job landscape than past generations.

Four separate but interrelated phenomena are driving this landscape: 1) the exploding use of temporary and part-time workers; 2) the rapidly evolving structure and conduct of companies; 3) technology not only supplanting manual labor but now advances in information technology and artificial intelligence beginning to supplant knowledge workers; and, 4) the shared economy taking traditional jobs out of the economy (think taxi drivers), while making it possible to earn a multifaceted living through a combination of endeavors.

As a highly utilized tool of traditional firms, outsourcing labor through the use of temps and part-time employees is creating instability for intermediate and long-term employment opportunities. This is exacerbated by rise of spider/provider firms due to their extreme flexibility in approaching business opportunities.

Today's firms are using information technology and the Internet to drive to ever increasing productivity. They know with increasing precision exactly what their worker needs are, and more

importantly, where they can find workers with the requisite skill set to accomplish the objective on an as needed basis. This trend has been accelerating and is creating an ever increasing disruption in wage earners' lives, including those with university educations.

The very fluid structure of a spider/provider company creates long-term employment instability within the firm itself and as the firm moves from one market opportunity to another the mix of orchestrated producers (firms, individuals) may vary continuously. Accordingly, for companies and individuals, establishing longer term producer relationships with spider/providers may not be possible.

Automation of manual tasks and now artificial intelligence are creating job displacement and at the moment it is unclear how those displaced by technology will find meaningful well-paying careers. Certainly one potential path is to become a company-of-one as an individual contractor or even greatly extend one's capabilities in product/service offerings by becoming an individual spider/provider.

Further, the shared economy is creating here to fore non-existent possibilities of earning a living in combination with creating a comfortable personal life style via multiple income streams. An interesting aspect of this approach to making a living is there is a certain safety balance in being diversified as an income producer, much like having a diversified investment portfolio protects against a single investment failure.

While the socio-economic answers to the rising potential problem of human jobs and earning capacity being supplanted by automation and artificial intelligence remain unclear, it is clear an educated worker who possesses an understanding of entrepreneurship and has developed the confidence to be entrepreneurial will have a better probability of a successful career in the workplace of the future. Particularly because start-ups and young companies are entrepreneurial by their very nature and are the source of most job creation, including the "Barbell effect of larger, more mature companies acquiring these entities to fuel their own growth. Clearly, creative, entrepreneurially oriented employees will be valued across the spectrum of employers generating the bulk of job creation.

Since the industrial revolution education has been the path to quality employment and a better future. However, the rise of the digital age is creating a landscape where vast elements of human endeavor are being supplanted by what some term "the rise of the machine". Beyond robotics and automation, jobs involving large amounts of information and algorithms to provide answers, such as structural engineering, reading x-rays, accounting, auditing, etc. are beginning to be accomplished using artificial intelligence. So how will humans earn their way? As suggested by the noted educator Sir Kenneth Robinson, education must endeavor to find the creative side of students to improve their future prospects. One element of this is being more "entrepreneurial" as a "habit of mind".

For all the points noted above, educators must endeavor to raise student awareness of the future job world they face and personal skills they must hone, including written and oral presentation, case method problem solving, negotiation, income modeling, self-branding, leadership/team building, etc. to improve their probability of career success in the future. Today's graduates likely face careers of 50-60 years or more in an environment of accelerating change in how jobs are defined and how one can earn a living. Entrepreneurship and the confidence to be entrepreneurial will certainly be valuable attributes in coping with future employment. Given the opportunity to experience entrepreneurship first hand builds confidence to be entrepreneurial and substantially reduces fear of failure, thus the education system should structure initiatives to create entrepreneurs, not just describe them. Business schools are rapidly spreading knowledge of *entrepreneurship, i.e., the process,* but more broadly, educational institutions must endeavor to create more focus on *the entrepreneur, i.e., the individual.*

REFERENCES

Keynes, J. M., (1963), *Essays in Persuasion,* New York: W. W. Norton & Co.

Fung, V., Fung, W. & Wind, Y. (2007), *Competing in a flat world: building enterprises for a borderless world,* New Jersey: Wharton School Publishing.

Friedman, T. L., (2005), *The world is flat: a brief history of the twenty-first century,* New York: Farrar, Straus and Giroux.

CONTACT AUTHOR

Roy Carriker
Charles D Close School of Entrepreneurship
Drexel University
3230 Market Street
Philadelphia, PA 19104
610-509-3928