

## **Enabling and Shaping Career-Related Outcomes in the U.S. Higher Education Ecosystem: Towards a Supply- and Demand-Side Stakeholder Analytical Framework**

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### **Abstract**

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*Today's U.S. higher education ecosystem undertakes expenditures reflecting a greater focus on end-user employability, employment and desired career-related outcomes. Taking a critical demand and supply perspective, regarding the outcome dynamics of stakeholders' behavioral inputs and content provision, their critical roles in provision are brought here into sharp relief. The paper attempts to tease out and highlight some of the key contributors' inputs and outputs to societal desired outcomes, as means to a desired "Mega" societal outcomes, such as income and gender inequality reduction. It concludes with insights into evolving technology developments, and recommendation for services providers and end-users alike.*

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**Keywords:** Online learning; Economics of education; Higher education; Future of education; Education technology

### **1. Introduction**

In today's higher education (HE) ecosystem, expenditures are undertaken as purposive *investments*, rather than as random *consumptive* outlays, especially with respect to tertiary end-users' educational outcomes (see Psacharopoulos & Woodhall, 1986). This has translated into a greater focus on end-user employability, employment and desired career-related outcomes. This paper takes a critical look at the development of the outcome dynamics of behavioral inputs, roles, interests, intentions and the interactions of key stakeholders involved in U.S. HE, in terms of their characteristic demands, shared goals, and declared intentions, with some attendant individual and institutional expectations and related challenges.

The holistic attempt being made here is aimed at capturing key interactions of evolutionary developments in this, a very dynamic HE ecosystem, tilting towards greater student access for inclusion, diversity and career-related and national economic outcomes. Taking a strategic and multidisciplinary perspective, this paper attempts to tease out and highlight some of the critical desired outcomes, products, intentions and results that are masked, bundled in, and enabled by interplays, supportive of other actors, institutions, student cohorts, faculty, advocacy groups, and some technology-based businesses, as means to achieving desired "Mega" societal outcomes (*see Kaufman, 2011; Paul & Cochran, 2013*). The use, therefore, of the word "outcomes" here, is not to be construed, as an unalloyed and unchanging basket of economic goods, but the outputs of the efforts of various HE stakeholders, that lead to high value-added job-related careers, as desired societal value-added outcomes (see Kaufman, 2011). Emerging out of this too, are the benefits of deconstructing and reframing institutional perceptions of two key concepts, namely, retention and graduation.

The U.S. HE environment is influenced by an economic climate, continuously impacted and fueled by disruptive, and especially, technologically-driven innovation. In accordance with the above, the first section of the paper explores who the stakeholders are, in addition to their respective expectations, interests, intentions and end-goals. The next major part examines the issues, requirements and challenges facing HE education services providers, that are aimed at enabling greater student gender inclusion, access, and outcomes, at the micro-level, as well as, at the macro-level, the broader intertwined, business-related, and national economic outcomes. The paper concludes with a discussion, recommendations, and some possible areas for research.

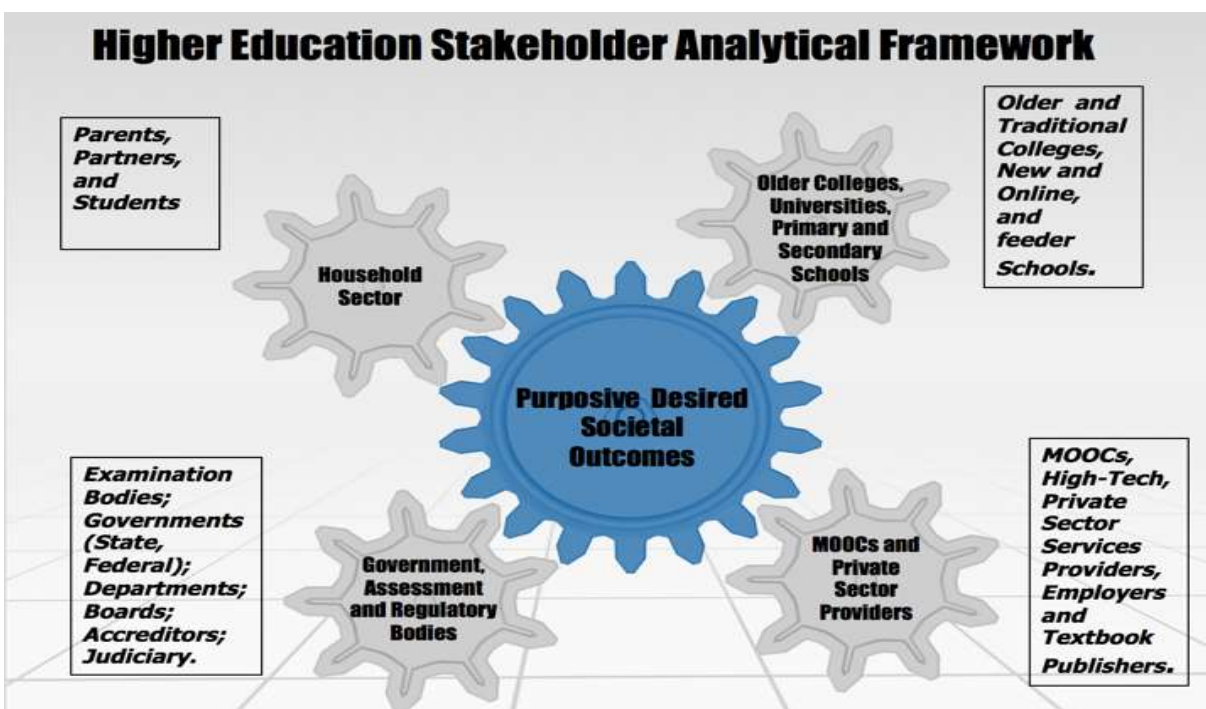
## 2. A U. S. Demand-Side and Supply-Side HE Stakeholder Perspective

Assuming an interpretational stakeholder viewpoint (see Aaltonen, 2011), there is no presumption here of an exhaustive list. For the purposes of discussion, a stakeholder is defined as any person, or entity that is affected operationally by educational outputs of any organization. Additionally, the term “*purposive outcomes*” is defined as expected outcomes, based on deliberate investments of capital and other resources by stakeholders.

Given the number of stakeholders in the education marketplace and marketspace (purely online education providers), regulator performance standards, and some already-accepted guidelines provided by groups such as AAC & U (American Association of Colleges and Universities) and LEAP (Liberal Education and America’s Promise), these together present a useful departure point for discussing holistically, a set of identifiable “desired outcomes.” As such, they enable industry observers to link key components of what currently obtains, with some emerging patterns regarding a dynamically evolving future.

Figure 1 below shows some key “demand side” actors (end-users dealing with the outputs of HE providers): households, state and local government, businesses, and regional accreditation bodies, combined with student and teacher representation. On the “supply side,” (providers of services or outcomes to meet the expectations of end-users) are the traditional HE institutions (community, two- and four-year colleges), Massive Open Online Courses (MOOC) providers as older college extensions, and some high-tech companies. The overarching objective of all the parties within this latter group today, has become the production of outcomes that prepare students for life, not just good-paying entry-level jobs, thus enabling lifelong learning in decided career streams. Businesses partnering with local and state governments together with accreditors also have desired outcomes, relating not only to candidate preparation for the world of work, but also increases in national competitiveness and workforce productivity (see U. S. Department of Education, 2015).

Basically, the framework represents only a snapshot of HE’s environmental activities. In totality, it suggests a need for a deeper appreciation of the inter-, and intra-groups and sub-groups interactions and exchanges between stakeholders in the ecosystem. Therefore, reactions occur dynamically and adaptively to internal and external environmental changes, leading to desired societal and HE student outcomes, the central focus. Regarding inter- and intra-group activity within the household group, for example, parents act and react to other parents (social media, town hall meetings), students to other students (messaging and social media), government to businesses (legislation, and in contested areas of law, the judiciary), and with businesses to teaching institutions (coding and entrepreneurial bootcamps). Hence, communication exchanges and engagement are taking place at various levels of formality and informality.



**Figure 1:** Interrelationships between key stakeholders in the U.S. HE ecosystem.

### 3. The Framework's Demand Side Actors and Stakeholder Relationships

Figure 1 below depicts increasing adaptive responses to stakeholder issues reflecting cultural and demographic shifts, with curricula demand responses and modifications in relation to: 1) student, government and business education outcomes, biased towards (Science, Technology, Engineering and Mathematics) STEM-, and (Science, Technology, Engineering, Arts, and Mathematics) STEAM-based education (the latter to satisfy employer demand for soft-skills development), business, and high-tech education requirements; and 2) adaptive pedagogy for MOOC online 24/7 on-demand delivery, to geographically-dispersed and culturally-different age groups for inclusion (Arnett, 2016b). Despite the identification of demand- and supply-side stakeholder groups, a level of situational cooperation exist between them, with no assumption of hierarchy or static positioning. The magnitude and/or the direction of "outcomes" movement, and the activity intensity of individual stakeholders, for example, can set in motion, or to a greater or lesser extent, induce behavioral modifications in some, and have consequences for others, thereby affecting the "desired societal outcomes" positively or negatively --- though not necessarily in this order.

#### 3.1. Households: Demands, Intensions, Purposive and Desired Outcomes

Higher Ed demand-side actors and stakeholders for analytical purposes are divided into the household sector (parents, partners and significant others), students, businesses, boards, government and regulatory agencies (local and federal), the judiciary, and teachers individually or with union representation. One key concern regarding the household sector is expected financial recovery. Another is student "boomerang" after college completion. Foremost for households, supportive partners, and related students today is the mounting costs of HE (Carter, 2016a). Parents as outcome influencers have risk-taking roles. Assuming parental involvement, this manifests itself through: a) role model behaviors; or b) making children's decisions, such as school track, for certain desired career outcomes. Possible revisions later, however, may reflect greater offspring independence (Huebener, 2015).

**3.2. Students.** Student demands warrant special attention regarding demographic and age cohort behavioral characteristics, particularly millennial expectations as "digital natives," and adults, as "digital immigrants." Emerging special demands and needs of both groups in terms of desired outcomes include: flexible course scheduling, unique billing options, and credentialing for industry-specific majors (Carter, 2016e). Beyond course materials' "ease of use," "digital natives" cannot all be considered extremely computer savvy. Older "digital immigrants" too, have special needs regarding content relevance and application, apart from degree completion. Additionally, HE institutions must consider geographical intake dispersion demands regarding time zones, as well as attention to cultural and language differences. Operationally, HE institutions face demands like "born global" businesses.

There remains too, the challenge of student retention regarding continuous attendance to single college degree completion, which may have some inherent cultural incompatibilities, like religion and course offerings. Students today are increasingly taking greater control of their education. Millennials are demanding characteristically more frequent performance feedback. Humphreys and Gaston (2016) report an AAC & U observed pattern since 2002, where students have not been remaining with just one college from start to finish. Instead, they have been moving from college to college, schools losing retention as students take some courses online, or register out to new campuses altogether. In effect, some students have been taking greater responsibility to create learning for themselves with MOOCs---from today's virtual education smorgasbord.

Students, asking for greater pluralism from teaching institutions, reflective of increased population diversity want cultural change and representative inclusion in campus culture, among other things (Arnett, 2016b). This inclusion too, must address varying abilities of those with differing capacities to learn, enhancing the importance of access and increasing accessibility for a more level playing field, greater value-added, and higher value chain production career-related choices (See Harper, 2010; Bart, 2012). Those demands stem from:

- a) Students who have physical or learning disabilities that create accessibility issues regarding online resources (for example, screens, sound, fonts, colors and so on);
- b) International and (online) college exchange students facing language challenges; and
- c) Student learning preferences, being inconsistent with instructor preferred approaches.

**3.2.1 Student Loan Repayments.** Students and parents alike, are impacted by the burden of student loans used to finance career-related education and goals. For those without the means, such loans enable self-actualization goals, but the attendant onerous debt burden on households is of great concern (Walsemann, Gee, & Gentile, 2015).

Student debt that does not pay back in terms of career goals and achievement, may potentially ruin household balance sheets (Elliott, Lewis, Grinstein-Weiss & Nam, 2014). This supports the perception of a shift in the college cost burden from society to students, highlighting concerns about the value of college degrees, and their incongruence with labor market job skill requirements (see Walsemann et al., 2015).

**3.3 Businesses, Government, Boards, Teachers, and Accreditors Desired Outcomes Businesses.** Regarding businesses, a key issue for other stakeholders is how well HE institutions are preparing students for success, in addition to meeting the challenges of the global marketplace. For instance, the private sector in certain parts of the country has been in discussion with government to close the skills gap to produce the required number of manufacturing engineers for a sustainable future, for employers and employees alike (see Arnett, 2016a). In this regard, business sector leadership has voiced concerns over (see Humphreys & Gaston, 2015):

- a) Graduate non-achievement of learning outcomes at high enough levels, in support of the country's technology-rich, and innovation-driven economy;
- b) What students are specifically learning in college; and
- c) What have the credentialed students specifically learned with respect to transcripts, resumes, and related documentation.

**Government.** The U.S. Education Department (2015) has the following website statement: “*Our mission* is to promote student achievement and preparation for global competitiveness by fostering educational excellence and ensuring equal access” (p. 1). Suffice it to say that policymakers at the various state and federal levels have been setting educational policy agenda and priorities to achieve certain funded purposive outcomes. Humphreys & Gaston (2015) report however, that some view their interventions as being too “... narrow, utilitarian, and ultimately counterproductive...” (p. 16).

Nonetheless, in response to the growth in tuition costs, the continuing evolution of education and instruction technologies, together with some difficult-to-penetrate job market segments that raise questions about access to, and the value of HE, federal and state government legislation and policies are requiring that HE institutions provide proof of: 1) they are fulfilling their missions; and 2) their impact on students' success, through outcome assessment (ke, 2014). Here, HE cost issues are being responded to, in part, with future consideration of tuition elimination for college education (Carter, 2016c).

**Boards.** At the board level, the California Community Colleges system, for instance, demands that provider systems be flexible at two levels: 1) to meet the workforce needs of the state, for example, by streamlining processes to approve new curricula for identified career programs; and 2) to accelerate the process to take less than the 18 months it currently takes faculty, to develop those, in order to match the needs of the sectoral technological boom taking place in California (Kelderman, 2016). The call to action to facilitate more lucrative career paths for HE students, now resting on the shoulders of provosts and deans, with government as influencer, is unambiguous.

**Teachers and Union Group.** This group's interests in the ecosystem go beyond job security and observations of students' performance. Today, some HE teachers are raising the nutrition issue of student “food security” for inclusion, upwards from the secondary to the college level, seeking the same health-related benefits (Mathewson, 2016a).

**The Accreditors.** These essentially are the regional college oversight accreditation bodies. They too, are responding to the demand for increased graduation rates. However, student employability has been a more recent focus. Whereas, the desired outcome for the college-to-accreditor relationship may serve sustainability through high enrollment and institutional reputation, some for-profit accreditors have not been meeting federal government standards (Carter 2016e; U.S. Department of Education, 2015; U.S. Department of Education, 2016a; U.S. Department of Education, 2016b).

#### **4. Supply-Side Issues: Enabling High Value-added, Cutting-Edge and Career-Related Instruction**

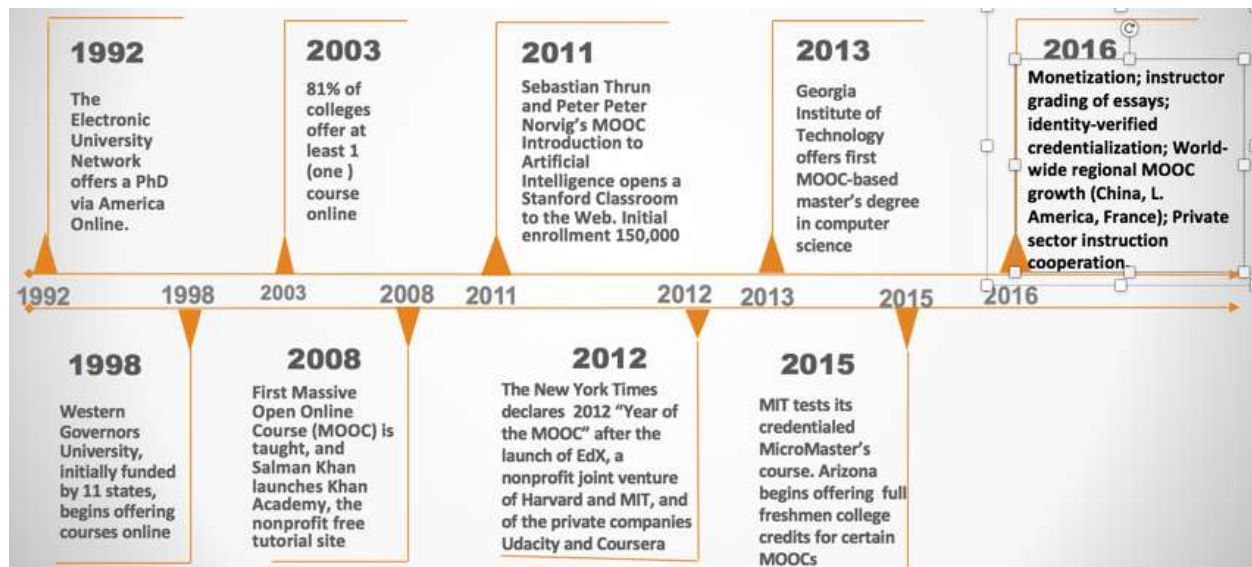
Turning to provision, on the supply side, the major stakeholders and actors identified in the framework are: 1) the traditional older, but evolving HE institutions; 2) the technology-based MOOC institutions, as extensions of classical older colleges; and 3) the high-tech and technologically-driven businesses, book publishers, and a growing number of private sector specialized content and training partners. For many HE institutional providers, a major issue *is not whether to offer online education, but rather* what kinds of online innovations should be undertaken (Anders, 2015; Anderson, 2015). For some, this has become an existential issue.

High-tech, higher value-chain producer company groups, as found in Silicon Valley, are concerned with getting work-ready hires. This is being addressed sometimes by company provision partnerships with technical instructors to MOOC and other HE environments. Such cooperation is providing opportunities for greater student diversity and career options, thus enabling a more secure future on higher value-added income earning streams.

#### 4.1 Disruptive Innovation with HE Instructional Provision

Disruptive innovation (see *Christensen, Raynor, & McDonald, 2017*) characterizes a great deal HE education services provision. It enables inclusion and thus expands opportunity and access to previously nonexistent higher value-added career choices for certain social groups. Resulting access to higher value-added supply chain participation, enables too, higher value chain female labor participation rates—a largely understated desired societal outcome (see Harper, 2010).

Perhaps, the greatest driving force in HE delivery today is MOOC-driven course provision, which allows for the monitoring of the progress of millions of students online. Of the four largest platforms in the world by registration count in 2016, after Coursera (23 million), were EdX (10 million), XuetangX (6million) FutureLearn (5.3million) and Udacity (4 million). Only one is non-English (Shah, 2016). MOOCs have the potential for improved, and more reliable data collection on national graduation rates, for the heretofore untapped national monitoring of career choices and paths. As such, they can: (1) provide clearer insights into how students learn; and (2) tailor classes more responsively, to individualistic needs (Leber, 2012).



**Figure 2** Timeline of Online Education in the U.S. **Sources:** Compiled from Byrnes, 2015; Shah, 2016; and Carter, 2017.

From Figure 2 above, a pivotal change of the MOOC's contribution to career-related outcomes, came in the year 2015. Looking inwards and outwards, the year 2016 saw the introduction of the human grading of essays, increased monetization, and the growth of competitive regional MOOC providers. Increased monetization has introduced greater financial stability to the MOOC model, with cost recovery and identity-verified certificate fees (*Straumsheim, 2016*). But for many MOOC providers, monetization has become a priority, as certificates, graded assignments and content are no longer free. Major providers have plans for paid-only courses. The monetization model is apparently working. In 2016, MOOC providers, Coursera, Udacity, and edX, together had potential earnings of about \$100 million (Shah, 2016).

Some popular MOOCs, as extensions of old and traditional HE institutions, are culturally different as they keep moving away from parental pedagogy (Lucas & Goh, 2009). MOOC courses, however, are having a major positive impact in helping workers achieve desired outcomes, by advancing careers especially in technical areas. A survey from online learning company Coursera, the University of Pennsylvania, and the University of Washington, reported that 87 percent of individuals who take online courses with the goal of career advancement had achieved success. Interestingly, nearly 35 percent reported very tangible benefits. Those included raises, a promotion, new jobs, and for some, their own businesses (Winfrey, 2015).

Facing U.S. visa-related declines in international student enrollments from two of their top four sources, South Korea and Saudi Arabia (reduced numbers), with India and China showing slower growth (Schaffhauser, 2017). Domestically, some neat patterns of co-existence have developed. Strategically, some primary and secondary institutions, have agreed formal preparatory “reservoir” arrangements: secondary institutions are becoming feeders and “incubators” for colleges, as the latter group tries to address enrollment declines. Increased enrollment competition at the graduate level too, is driving graduate institutions into partnering with colleges to boost their declining enrolment numbers, improve their bottom lines, and perhaps even their survival chances. Aided by some institutional relationships, some student career streams are already being enabled, determined or shaped by secondary and undergraduate school attendance and choice. With such institutional interconnectedness, some HE institutions today might just be on the cusp of the creation of “the boundary-less university.”

#### **4.2 LMS Platforms: Enabling Purposive HE Careers through Instructional Technology**

Against the backdrop of concerns that HE technology use is a significant cost driver (Wildavsky, 2016), the learning management system (LMS) platform, is a common technology teaching tool, which in large part, presents online, what has been perfected sometimes offline (videos, slides and so on) (see Ahearn, 2017). Some institutions have invested in, and migrated to several such commonly-used delivery systems for example, Moodle, Canvas, and Blackboard. Granted the rapid pace of education technology development, a major challenge going forward, is to weave together, an ever-growing number of visual-based media applications into existing or “legacy” LMS platforms, for seamlessly-working campus networks. To reduce education delivery cost, LMS content must be made flexibly accessible to all mobile BYOD-ready (bring-your-own-device) students (see Vaddio, n.d.). Adopting innovations in the “next generation digital learning environment” or NGDLE, the new forms of human-computer interaction (HCI), such as augmented reality (AR), virtual reality (VR), mixed reality (MR), and accessible interoperability will remain key for inclusion, equal opportunity career options, and subject matter choices, for those with special and subject matter needs (Mathewson, 2016b; Kelly, 2017). This has implications for the employment and contributions of creative learning systems designers. With further change underway in today’s HE ecosystem, the LMS serves as: 1) a *tool* used for; 2) *instructional tasks* that can, in turn, morph into; 3) *online course participant learning activities* (Schoonenboom, 2014). Using the LMS as a base, sellers of presentation software and media, together with book publishers and their supportive software, have sales objectives as desired outcomes, on the one hand; on the other, are end-users (instructors and students) of providers’ largely instructional content.

#### **4.3 Provisioning with Financial Cost Reduction**

Many college business officials consider that HE today is facing a financial crisis Carter (2016b). Cost control and cost savings goals and activities in this growing entrepreneurial environment of online learning and delivery therefore include for example: a) mergers (Georgia and Vermont); b) tuition reductions to increase enrollment (North Carolina); and c) marketing, for the smaller and financially challenged institutions.

#### **4.4 Enabling Inclusion, Access and Increased Accessibility in Provision**

Education providers face a raft of legal and other challenges with respect to inclusion and access. Student educational outcomes are affected by factors that impact for example, student intake and inclusion (equal opportunity and access). A recent ruling by the U.S. Supreme Court (Reuters-CNBC, 2016) upheld the practice of considering race in college student admissions, designed to increase enrollment rates for minorities. Yet, despite this latest Supreme Court ruling on affirmative action, additional related challenges lie ahead.

Higher-ed providers face liability for inaccessible web content and technologies (see Carlson, 2016). Online education providers must deal with inclusion standards, appropriately addressing the legal challenges associated with required captioning for the hearing impaired. Witness the National Association of the Deaf (NAD) litigation (case numbers 3:15-cv-30023, and 3:15-cv-30024) against MIT and Harvard University. At issue, was the perceived failure to provide accurate and comprehensive captioning for online course materials. Therefore, there is a need to have built-in proactive preparation, before a course goes online, and ahead of the registration process (Moore, 2014). This has been responded to, in part, by creating teams comprised of accessibility officers, with new policies and training programs for comprehensive access. For effectiveness, now, and going into the future, HE providers must incorporate innovative and assistive teaching technologies (see Mathewson, 2016c; Betts, 2015).

Instructor skill-sets remain a critical factor in the HE teaching-with-technology environment, to achieve greater success related to student learning preferences, and business and government stakeholder societal interests, and outcomes. Instructor self-efficacy is regarded as a predictor of technology use (Corkett & Benevides, 2013).

Therefore, faculty must be encouraged to incorporate teaching technologies in their courses. On-going innovative technology use training for faculty is therefore imperative. Instructors, however, are being incentivized in the system to train, to improve their efficiency and productivity regarding education technology (Kurshan, 2015). Devaney (2016) reports HE instructors have indicated a preference to participate in training for online software, classroom management strategies, and digital device training. Some stakeholder concerns regarding examination authentication are now being reduced with proctoring technology availability, such as *ProctorU* (see Bergstein, 2012).

#### **4.5 Supportive Career-Oriented Developments Trends in U.S. HE Provision**

Entrepreneurial training for personal job creation has become an essential as part of the curriculum of a growing number of colleges. Some of these initiatives are being combined with accelerated courses to address the employee-readiness needs of high-tech companies. Partnerships with accounting, business and entrepreneurship training providers, such as *Fullbridge*, have become an important part of curriculum development and delivery. Such partnerships and national professional associations are helping to close the skills gap for employment readiness, thereby providing necessary leverage for accessing careers with present and future higher value-added income streams.

Additionally, digital badges are also facilitating the qualified entry-level recruitment process. Not regarded as substitutes for degrees, badges act as add-ons to degrees to help students display academic and non-college skills and accomplishments that are not conveyed on transcripts (Fain, 2016). Bethke (2015), cites Susan Manning, professor at the University of Wisconsin-Stout, who perceives that partnerships that give rise to digital badges permit competencies and achievements to be converted to marketable credentials. Regarding transcripts, HE institutions are looking to *block chain technology* to enable students to hold and share their own official records directly with others, for example, degrees, transcripts, certifications, and badges, in a manner that is safe, tamper-proof, and trusted (Stansbury, 2016).

As reinforced by Carter's report (2016e), in today's HE environment, there is much greater focus on education that provide good paying jobs, with high-level hiring needs, but with low-level technology displacement of workers. Related to this were the following subject matter areas: computer and information sciences, engineering, architecture, management, health professions and finance. This has positive implications for HE course offerings, accessibility, career choice, and higher income-earning and gender-equality futures. It further points to a need for college administrators to link disadvantaged and minority students, to career streams with higher value-added, and technology-related supply chains.

#### **5. Discussion and Conclusion**

Table 1 below summarizes some key desired and purposive outcomes by stakeholders highlighted in the U.S. demand and supply HE ecosystem and framework discussed. The details, although developed from largely secondary sources, suggest a range of available options and methods to enable more students to gain greater access and accessibility, to higher value-added jobs and career streams.

<b>Table 1: Stakeholders' Desired and Purposive Education Investment Outcomes</b>			
<b>Demand-side: Desired Outcomes</b>		<b>Supply-side: Desired Outcomes</b>	
<b>Households:</b>	<ol style="list-style-type: none"> <li>1. High value-added jobs upon completion</li> <li>2. Ability to repay student loans</li> <li>3. Quality instruction and caring</li> <li>4. Access and accessibility</li> </ol>	<b>Old Classical Colleges:</b>	<ol style="list-style-type: none"> <li>1. Enrollment and retention</li> <li>2. Favorable graduate rates</li> <li>3. Cost-recovery</li> <li>4. Entrepreneurial skills with badges and partnerships</li> </ol>
<b>Regulatory bodies:</b> -- Accreditors -- Government	<ol style="list-style-type: none"> <li>1. Assessment: ADA compliance, rules</li> <li>2. Specified performance outcomes in terms of gaps or identified deficits</li> <li>3. Employability, workforce needs</li> <li>4. Proof of schools fulfilling their missions; impact on student success</li> </ol>	<b>MOOCs (newer and college extensions):</b>	<ol style="list-style-type: none"> <li>1. Enrollment</li> <li>2. Retention</li> <li>3. Favorable graduate rates</li> <li>4. Cost-recovery</li> <li>5. Entrepreneurial skills with badges and partnerships</li> </ol>
<b>High-tech businesses:</b>	<ol style="list-style-type: none"> <li>1. Evidence of what students have learned in college</li> <li>2. Employee-readiness for high-tech jobs</li> </ol>	<b>Businesses -- High-tech -- Textbook publishers</b>	<ol style="list-style-type: none"> <li>1. Evidence of what students have learned in college</li> <li>2. Employee-readiness for high-tech high-value-added jobs</li> <li>3. Book Sales with courseware</li> </ol>
<b>Teachers and their unions:</b>	<ol style="list-style-type: none"> <li>1. Conditions of work</li> <li>2. Job security</li> <li>3. Concern for students' welfare</li> </ol>	<b>Government: -- Boards</b>	<ol style="list-style-type: none"> <li>1. Readiness of HE students to participate in global high-tech</li> <li>2. Competiveness for GDP growth</li> </ol>

Highlighting the dynamics of the existing and still evolving stakeholder interrelationships, one understated beneficial career-related outcome of higher-valued partnered world-of-work relevance to HE, has been the incorporation of advanced technologies and innovation, as inputs into instruction sets for job- and career-related outputs. The usually high correlation between those high value-added product creations with more lucrative paying jobs and careers (see Carter, 2016d), have additional benefits: higher valued national output levels and GDP, by the retention, creation or expansion of innovative jobs.

The student retention issue from an HE institutional provision perspective suggests this: Course offerings on different campuses need a better system to trace and record individual student movements from one campus to another. This warrants a rethink the related concepts of retention, graduation, survival and societal contribution upon HE completion (see Kaufman, 2011; OLC, 2015). Privacy issues aside, a social security ID type number, that can follow student migration from school to school, from college to college, and from campus to campus may offer new retention insights. Adopted, this can assist differentiation between those who may have moved from one campus to another, or to another college altogether, from those who otherwise may have dropped out from the HE system---completely. This brings into sharp relief, those, who having left temporarily, may have re-entered later, as returning mothers (OLC, 2015). The application of the Internet of Things (IoT) with big data analytics, and an education ID, together can reduce over-reliance on institutional usage data alone (see Porter, 2015), for possibly, more accurate country-wide data on graduation and retention rates. Increased business sector instruction partnerships, may also provide near seamless transfers with internships offers, from the classroom to higher valued career workplaces. This suggests a more decisive jump onto the next education innovation curve and frontier, as have some traditional institutions (see Rutgers Business School, 2016) to the IoT, addressing the related TIPSS (Trust, Identity, Privacy, Protection, Safety, and Security) risks, with Big Data capture and data analytics (Hudson, 2016). Together, this may enable improved “origin and destination” studies.



Content provision through interventions, direct collaboration, and corporate partnerships, with high-tech companies providing their own employees as mentors and instructors, and thereby shaping the careers of graduates, represent the crossroads between education and international competitiveness on one hand, and on the other, cost reductions in recruitment for a technologically-ready workforce. There is also a need for research regarding a determination of reliable causes for student college substitutions or migrations, as combinations of either, a response to quality, convenience, or cost. Another area for investigative research might be, HE career outcomes effectiveness: the extent to which students upon college completion return to parental homes, and still needing support. Useful too would be studies monitoring changes in LMS platform use as communication tools, and its integration with next generation digital learning environment technologies. Finally, of value too would be evidentiary support, tracing any widening of the adoption of the IoT, as business and entrepreneurial classroom instruction models in HE.

From the foregoing, it can be stated that there are several techniques available for adoption and adaptation to address the supply and demand issues facing HE provision, for producing more career-oriented purposive results, and in-demand desired stakeholder outcomes. Inclusion and diversity elements can result in a higher level of the female labor force participation rate, as part of wider access to the higher value-added education, and supply chain involvement in technological production, for more rewarding careers, and greater equitable income distribution. This however depends on curriculum design changes, the level of institutional technology adoption with increasing faculty use, and the extent of the use of learning management systems. The MOOC model shows flexibility upsides for delivery and provision, that seemingly is presenting less of a challenge for cost-recovery goal through increasing monetization. However, enhanced corporate content partnership arrangements offer good reasons for optimism, and the self-actualization of student career-desired and national outcomes.

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