A Case for Using Specific Technology-Facilitated Skills in the “Knowledge Age”—Training for Current Business Needs

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Although academicians, individuals, and societies in general have been made aware of “future shock” implications, globalization, and increasing technological developments affecting everyone at accelerating rates, it is clear that not enough has been done by educational bodies in most cultures to prepare individuals who now often find themselves victims of a skills gap. The investiture of financial and human capital in skills preparation or re-training, though recognized by businesspersons, economists, and many scholars for decades, is often now characterized as “too little and too late”. Now in the second decade of the 21st century, many developed economies are finding that the demands on individuals and organizations in this climate of continuous change are great, yet the means and processes to deliver the multiplicity of necessary skills is distressingly lacking. Individuals and institutions, who belong to what are considered “developed” societies, and are living in this era of accelerating skill demands are either becoming victims of this shift in social parallels and are either unaware of the demand for lifelong learning or are unwilling or unable to face the requirements. What can be done to address this deficiency in this era of the “Knowledge Age”?

With expertise and equipment ever expanding, societies have moved from the Industrial Age (approximately 1800 to 1950s), into the Technology/Information Age (1960s to 1990s) and now into the Knowledge Age or knowledge-based society in which we tap the resources of human capital, mass customization, global organizations and increasingly are putting greater value on non-cognitive and affective skills. We are also seeing business producers promulgating the business model directly with customers who sometimes are now referred to as “prosumers”, e.g., Dell Computers, Amazon, e-Bay, etc.[[1]](#footnote-1) The idea of going direct has accommodated the desires of modern day consumers for choice, speed, variety, quality, and customization. Networking directly with consumers has created the need for many technological skills now required by e-commerce, including software and web development, artificial intelligence framework as used in data mining, communications technologists and specialists, etc. Network marketing has not just become well known, it is becoming the dominant form of sales model with the multitude of skills required to support it. Are we training students to master these new skills? Network marketing works in the business environment, but providing skills to client/consumers can also work in educational models, but development in that area still lags.

The shift in unskilled labor to skilled labor is ever mounting. And more importantly, the skills that one has do not remain static. New training and re-training are necessary to maintain one’s current career status as well as allow that person to move vertically or laterally in the workforce. However, it can often be seen that in today’s educational models, parents and community members are disappointed by results. Most youth don’t find themselves in the job market until they are in their late twenties. The National School Board Association (U.S.) reports that “by age 25 only 25% earn a BA, [and] 5% earn an associate’s degree.”[[2]](#footnote-2) A ***perceived*** decline is reported even though educational achievement is rising, according to the Education Commission of the States’, *Bridging the Gap.* With continued organizational downsizing and restructuring, multiple career changes continue to grow. These continuing developments accentuate the role that lifelong learning and flexibility must preoccupy anyone wanting to remain active in the workforce, or indeed be active as a contributing member of society. One poll based on a study indicates that the average job lasts about 2.5 years.[[3]](#footnote-3) Consequently, lifelong learning will be a must. Wikipedia, in part, defines lifelong learning as one that “not only enhances social inclusion, active citizenship and personal development, but also competitiveness and employability?” Is the task to instill the *need* for lifelong learning in our students a possibility?

The skills that will be required will not and cannot only be the “hard” skills, but also what might be considered “soft” skills including what are being publicized as 21st Century Skills by the Partnership for 21st Century Skills and the American Management Association. Partnership for 21st Century Skills (P21) provides its membership the tools and resources to assist by combining the 3Rs with the new 4Cs (Critical Thinking and Problem Solving, Communication, Collaboration, Creativity and innovation).[[4]](#footnote-4) The promoting of these “higher” skills training can be accomplished only by redesigning students’ educational experiences to increase completion rates. There must be structured pathways to certificates and degrees followed by evaluation of educational practices (Is industry getting what it wants and needs from a trained/degreed individual?). Education will also need to focus on dramatically improving college readiness. The 3Rs do not diminish in importance in conjunction with the 4Cs. The promotion of these combined skills will help close skills gaps because career and technical training will help students prepare students for existing and future jobs in regional and global economies. To further promote and assess, partners in education and industry must more clearly re-define roles by reviewing respective tasks of current education and employment needs, ascertain if support structures (feeder schools responsible for entry-level skills) are adequately preparing students (through assessment), collaborate with private sector, government, and philanthropy to support the goal of preparation, and finally create incentives and opportunities for student and institutional success. Many high-growth skill areas currently exist (including healthcare, education, accountancy, software development and application, to name a few; however, it is clear that we will no longer be able to educate and train individuals for jobs that do not yet exist. Who could have predicted cell phones for almost everyone, ipads, Kindles, Smart phones, hand-held GPS, text messaging, Twitters and Tweets, MySpace, YouTube, Facebook and Wikipedia? Employers seek individuals who have the new essential of communication/ collaboration/ interpersonal skills, critical thinking/problem solving skills, creativity and leadership skills necessary for the global economy. In the “Knowledge Age”, the learning paradigm has changed. According to Camille Preston of Aim Leadership, “Fifteen years ago, people who had access to information were in power. Now with the internet, everyone has access to information. Information is no longer a differentiator. What’s important is your ability to cull from all the information that exists. Information drives insight, which is really at the core of wisdom [knowledge].”[[5]](#footnote-5) As educators, we must realize that schools thrive on relevant information. In our rapidly changing world overflowing with new technology, our teachers and students require the *right* information, from accurate sources today. Having direct access to industry information gives the competitive edge needed to succeed. Student performance and learning can be improved when enhanced teaching through technology is implemented as the norm. Learning paradigms must, therefore, shift. Glenn provides a sampling of these “Learning Paradigm” shifts as paraphrased from a table illustrated below:[[6]](#footnote-6)

|  |  |
| --- | --- |
| **20th Century** | **21st Century** |
| Memorize | Know, think, do |
| Textbook | Research |
| Passive | Active |
| Work alone | Work with others |
| Teacher centered | Student centered |
| Siloed curriculum | Integrated curriculum |
| Evaluation by teacher | Evaluation by self, peer, “real world” |

Sources: Joanne M. L. Glenn (NBEA Consultant); Eve Lewis (South-Western Cengage Learning); Tim Magner (Partnership for 21st Century Skills); Connie Forde, (Mississippi State University); Camille Preston (Aim Leadership LLC).

Instructional methodology must, therefore, change in order to better meet the needs of our rapidly changing economy. We will not only require knowledge managers but knowledge workers who both function actively in this era of perpetual change and continued acceleration of knowledge. Businesses are *decreasingly* accepting of this role. The common worker must be encouraged to maintain a sense of curiosity about areas where his/her career is changing—or be at risk of losing his job. In order to be more competitive, businesses are continually hiring contract or temporary workers whom they do not have to train or re-train to any significant extent, thus reducing company training expenses.

Changing viewpoints in workforce development reflects the new 21st Century Skill set. The National School Board Association provides a sampling of these changes through its website toolkit (NSBA, 2012).

|  |  |
| --- | --- |
| **From:** | **To:** |
| Competition | Collaboration |
| Win/Lose Conflict | Win/win conflict |
| Destructive (fighting) | Constructive (helping) |
| One-sided | Shared |
| Rejecting others’ points of view | Accepting others’ points of view |
| Others as enemies | Others as colleagues |
| Suspicion | Trust |
| Commitment to self or group goals | Commitment to total organization goals |

Source: <http://www.nsba.org/sbot/toolkit/chinv.html#Organizational>

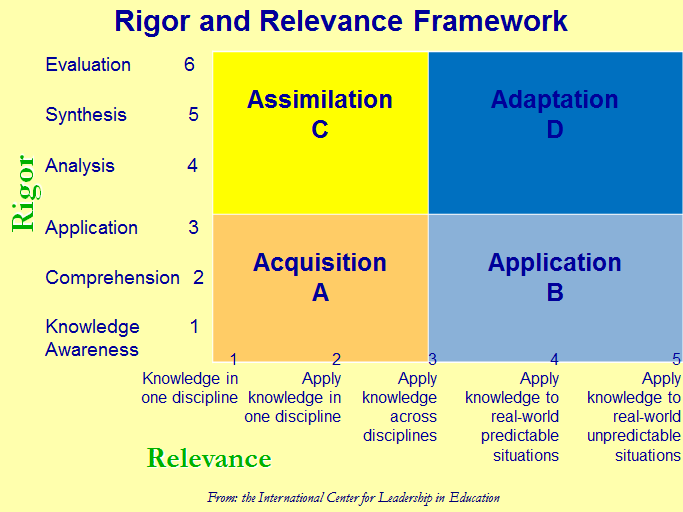
Technology can assist with the shift to “Knowledge Age” skills. As Cedric Price, renowned architect, is credited as saying, “Technology is the answer, but what was the question?”[[7]](#footnote-7) Business educators must look at ways that have either proved to be effective by practice or extensively research ways that use primary data to assist in the process of training for these skills.

With changing societies and the altering economic re-structuring (BRICS—Brazil, Russia, India, and China), technology has played a major role in training for this growth. Emerging economies such as Turkey, Indonesia, South Africa, and Nigeria have also grown considerably. Methodology toward training the workforce of these economies is rapidly shifting to online education models--such as the Open University of the UK (1970s), followed by Open Education Resource movement, based on the idea that knowledge is a public “good” and technology could be used to share, use and reuse it. (MIT’s OpenCourseware initiative, Rice University’s Connexions, the OpenLearn, of the Open University of the UK among others have promoted online education in order to help meet the needs of the growing demand for higher education and technical training. Open Education Resources (started in 2002) are most often free and freely available.[[8]](#footnote-8) All levels of education can use them, and they are reusable without having to seek permission of the author. They are often available in various formats, but most usable in a digital format. Collaboration can save academics considerable time and expense. The recent movement toward the offering of Massive Open Online Courses (MOOCs) have gained considerable attention by many universities. Although there is much controversy as to where and how MOOCs are evolving, they are presently promoted by many universities to attract new students in starting programs at reduced or no costs. Getting credit for those courses is not often possible; however, completion certificates are often given, although completion rates are usually very low. Their value is often questioned by a number of academics due to a lack of effective management because of large enrollment and, therefore, usually as a consequence of large numbers, limited feedback most participants receive.

The use of online models of open and distance learning (ODL) can help academia reap the best content to diversify course offerings and answer such questions as what is relevant to current needs in relation to employers’ demands. Also, non-cognitive skills are gaining increased emphasis in such areas as leadership training, communication, flexibility, ethics, and collaboration—all part of the new Knowledge Age skill set. The potential for integrating these new skills into the curriculum can be more easily met with collective resources. The crux of open educational resources (OER) and MOOCs is that their development should be able to help educators to select optimal choices of course content. However, quality measures and matters must be considered so that what we say we are providing (objectives) is what we actually provide at an acceptable level of understanding (measurement).

Education’s role in offering the 3Rs and now the 4Cs puts educational authorities and delivery systems at full thrust if they are to be most effective and efficient. Several models that have in the past proved to be successful are Registered Apprenticeships and Career Academies. Both of these models partner with business and industry to determine what specific skills are needed and then offer the necessary career preparation with the skills training and at the same time earn a degree. Many technical schools, colleges, and universities often find work placement and internship courses offered within programmes to be effective in real-world skill applications. At the Bermuda College, we increasingly offer both of these options to our students depending upon the programme in which they are enrolled. With rapidly changing skill sets, the transition from high school to postsecondary education (technical schools, community colleges, etc.) is more challenging and complex. Rigor and relevance must go hand-in-hand. Technology can help in this process through various distance and online delivery systems.

The Rigor/Relevance Framework® is a very useful structure that can help examine curriculum, instruction and assessment.[[9]](#footnote-9) As such, it is based on two dimensions of higher standards based on Bloom’s taxonomy and student achievement. The four quadrants are composed of A (skill acquisition), B (knowledge application), (C) assimilation (higher knowledge taxonomy levels), and D (adaptation of higher level skills to new applications. The Rigor and Reference Framework is illustrated below:



The premise of the Rigor and Relevance Framework is that you can improve something that can be measured. Skills and the level of their mastery can be more readily measured with this knowledge taxonomy and application model. If skills are not mastered to a desired level one can continue to present applications at higher taxonomy levels until the desired level of skill is mastered.

In conclusion, modern day digital tools can help build present-day knowledge age skills such as the 4Cs through the networking of humans through technology in order to build knowledge in creative ways and with options that meet individual needs. We are today moving to learning environments where the student must be doing most of the “thinking” and “working” as opposed to the facilitator/teacher, who must provide an appropriate path with stimulating applications. Technology skills can help both the teacher and the learner and also help them measure our successes with greater ease. After all, it is more difficult to improve results if we don’t measure them. As Albert Einstein has said, “Problems cannot be solved at the same level of awareness that created them.” We must increasingly utilize technology to individualize and meet the needs of the rapidly changing economies and provide educational opportunities at affordable prices for the ever-increasing numbers seeking the skills that the 21st century demands.

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