Higher education in the knowledge and innovation economy: Evolving toward Leapfrog Campuses

Arthur M. Harkins, Ph.D.
Profesor de Educación y Estudios de Innovación
Colegio de Educación y Desarrollo Humano
Universidad de Minnesota

310J Wulling Hall
East Bank Campus
Minneapolis, MN  55455
USA

harki001@umn.edu
tel +1 612-624-5244
fax +1 612-624-3366

PERFIL DE TRAYECTORIA ACADÉMICA

Arthur M. Harkins, Ph.D., is an associate professor in Educational Policy and Administration at the University of Minnesota. He is a faculty member in Comparative and International Development Education (CIDE) and the Department of Sociology. He is faculty director of the Graduate Certificate in Innovation Studies. With others, he recently developed a CIDE doctoral concentration in Global Youth Policy and Leadership.

Harkins’ most recent work is focused on social and economic challenges driven by rapid technological change, international competition, and the global effort to overcome obsolete methods of human capital development. His longer-term view is informed by the Ray Kurzweil’s hypothetical Technological Singularity, a profoundly important convergence of several key technologies projected to occur over the next few decades.

Harkins is co-author or co-editor of five books, including Cultures of the Future with M. Maruyama, and StoryTech: A Personalized Guide to the 21st Century, released in July, 2006. His most recent articles focus on new forms of knowledge production in universities and the application of intelligence-amplifying software in the education of college and pre-college students. With John Moravec, he is co-editor of the new electronic journal, Global Leapfrog Education.

Harkins has been a consultant and speaker to many public and private organizations, among them colleges and universities, media, professional societies, the military, computer and power companies, and city, state, and national governments. He has been a regular commentator for National Public Radio, Minnesota Public Radio, and several Minnesota radio and television stations.
RESUMEN DE TRABAJO

This essay asserts that nearly every youth and adult, including collegiate undergraduates, is already practicing an implicit skill set with strong ties to the broad development goals of tertiary education, especially those common to applied skills associated with changing ideas. We claim that the average undergraduate exerts far more inventive and innovative activity than credit is given for, and that tertiary education should address itself to facilitating processes of invention and innovation while collaborating with undergraduates to produce knowledge.

We believe that the means for providing this support are to adopt the Leapfrog Principle and to develop its functionalities on selected Leapfrog Campuses. The core components of the Leapfrog Principle are to identify Jump Points for leaping ahead of legacy traditions and practices; to involve students in this process; and to reframe students as working members of the intellectual economy.

The arguments for this association are two: (1) that the ‘ordinary’ undergraduate could benefit enormously from continuous contact with Leapfrog Campuses based on Leapfrog principles, especially if the undergraduate body is part of a society moving toward continuous innovation; and (2) that colleges and universities would gain enormously from inputs of information, knowledge, and ideas from its undergraduates. The proposed task of a Leapfrog Campus becomes two-fold: (1) to assist the ‘ordinary’ undergraduate to become ‘extraordinary’ in ways that emerge from collaborations between the two parties; and (2) to evolve the Leapfrog Campus and its undergraduates as co-leaders, with faculty, in knowledge development and its subsequent innovative applications.

PALABRAS CLAVE

Nueva economía mundial; El desarrollo de los conocimientos; Leapfrog Campus; Educación superior; Innovación continua sociedad; Singularidad tecnológica

Introduction

We submit that the ordinary undergraduate’s skill set includes a host of capabilities common to the professional practices of practical colleges and research universities. We believe that such
skills should become the core of knowledge producing, innovation-focused curricula and pedagogies.

These skills may be understood as evidence of an implicit professionalism demonstrated in countless daily acts carried out by literally billions of ordinary people. We define implicit professionalism as the protean layer of competencies, skills and performances that characterize expressions of personal and social capital and their potential growth. It is these complex forms of implicit professionalism that knowledge creating, innovation focused Leapfrog Campuses, through creatively constructed services, can and must develop to serve undergraduates. Mexico is an excellent candidate to initiate Leapfrog Campuses within its borders and beyond, as are many other nations.

Some of these skills, all associated with expansions of personal and social capital, are:

**Thinking systemically:** perceiving existing patterns and constructing alternatives to them.

**Thinking simulationally:** conducting “what if?” thought experiments and mental rehearsals using controlled imagination and projections.

**Thriving in the midst of changes, challenges, and unknowns:** developing perspectives, knowledge, and choices to cope with and leverage complexity and uncertainty.
Creating and manipulating alternative pasts, presents, and futures: creating and managing virtual time; developing flexible definitions of social and personal time; selectively associating alternative pasts and futures with multiple presents.

Developing and responding to goals and challenges: setting goals and objectives; anticipating and detecting goals to success; designing solutions to impediments.

Understanding and effectively utilizing existing information: accessing and selectively employing information in pursuit of opportunities and problem resolutions.

Constructing and utilizing personally applicable knowledge: selectively transforming information into personal usable knowledge; building a personally styled capability to add intellectual and other forms of variety to the world; enhancing decision-making options.

Constructing and utilizing knowledge related to contexts, processes and cultures: perceiving, designing, and constructing real and virtual contexts suitable for specific tasks; compiling and utilizing many perspectives on given subjects; enhancing decision-making options.

Effectively utilizing current and emerging ICT systems: staying atop the technologies that permit modern learning and economies; being first in the adoption and effective use of hardware, software, and networks.
Acquiring and assessing knowledge of selected global trends: constructing “big pictures” of the world using different resources for each picture; becoming a global thinker and citizen; employing big pictures to help contextualize relatively localized problems, opportunities, goals and means.

Writing and speaking in a unique voice: developing and utilizing personal uniqueness; applying uniqueness alone and with cohorts, groups, and teams; developing personal identify and character.

Taking personal responsibility for intentions and performance quality: ethically accepting accountability for personal actions and inactions; accepting personal and social assessments of performance quality.

These skills may be understood as evidence of an implicit professionalism demonstrated in countless daily acts carried out by literally billions of ordinary people. Again, we define implicit professionalism as the protean layer of competencies, skills and performances that characterize expressions of functional personal and social capital. It is these complex forms of implicate professionalism that a knowledge creating, innovation focused Leapfrog Campus, through individually constructed services, can and must develop to high levels among its undergraduates.

Leapfrog Campuses for 21st Century Skills

Leapfrogging means to get ahead of the competition or the present state of the art through innovative, time-and-cost-saving means. One example of leapfrogging is Finland’s jump to
wireless phones, saving that country the cost of deploying an expensive copper wire system. Another example is present in some of the Kent, Washington (USA) public schools, which now permit students to use wireless Web devices to help them access information to better pass tests. Leapfrogging has become a major strategy of developing countries wishing to avoid catch-up efforts that otherwise portend a high likelihood of continued followership. A similar approach to gaining the lead rather than assuming a persistent runner-up role has been adopted by many industries, schools, and individuals.

World-wide in many fields, commons-based peer production through open sourcing drives maximum participation in the innovation process. An example of open sourcing is a participatory democracy, in which everyone communicates with elected representatives. Another is the company suggestion box (Toyota has one every few feet along the assembly line). While the concept of open sourcing has largely been associated with the computer software industry, the idea is obviously transferable to tertiary education, innovative leadership and management. Previously locked-in situations, either organizational or personal, can be unlocked through the involvement of new people, new information, and new knowledge.

A new emphasis on undergraduates as creatives is required. Some of the critical questions associated with this emphasis, in association with Leapfrog Campuses, are:

- How can Leapfrog Campuses vastly expand their impact on undergraduates and vice-versa?
- How can undergraduates routinely produce tacit and explicit knowledge, and then employ it innovatively with the assistance of Leapfrog Campuses?
• Can Leapfrog Campuses move to create expectations of innovative leadership among its undergraduate students and their faculty?

• How can this daily expression of personal capital growth become part of expected services delivered by Leapfrog Campuses?

• How can Leapfrog Campuses expand both personal capital and social capital, in part by making the substance of each more individualized and purposively developmental?

• Can Leapfrog Campuses shift from industrial/information-age models of human capital preparation to knowledge/innovation models?

• Can Leapfrog Campuses seriously focus on recognizing and developing the uniqueness and variety of undergraduates through technology-supported, individualized learning services?

• Can Leapfrog Campuses focus more on student innovations as opposed to context-free testing and rigidly constrained paper topics?

• Can Leapfrog Campuses become more experiential and experimental as they move toward knowledge based, innovation-supportive learning services?

• Can Leapfrog Campuses support development of the innovative individual through lifelong subscription services?

• Can Leapfrog Campuses provide new subscription networking for their alumni, productively linking them to one another and to undergraduate students?

Guided by these questions, we have been reviewing global trends in higher education and have developed several approaches for enhancing the agenda to move Leapfrog Campuses to the forefront of world colleges and universities. This will be no small task. It will require a great deal of creativity and innovation, not just more variations of the same.
What drives our ideas and interests can be summarized in terms of the following: a) an emphasis on initiative and proaction rather than reaction; b) policies that foster leapfrogging activities instead of catching up; c) reconsideration of the balance between disciplinary and interdisciplinary programs; d) recognition of the relationships between internationalization and globalization (especially the need to synergistically integrate these two concepts); e) an emphasis on innovative knowledge production, distribution and utilization; and f) development of lifelong learning programs that reach larger numbers and varieties of students and stakeholders.

For these tensions to become creative and productive, Leapfrog alternatives to current campus planning must be energetically put into place.

**Leapfrog Campuses as Processes**

We must look *beyond* the horizon as well as *toward* the horizon. The most important of the University’s potentials is Leapfrogging. The practice of leapfrogging allows us to proactively and creatively build preferred futures through strategic reassessments and realignments of perceived challenges, opportunities and priorities. This requires rapid change and a commitment to innovation among all levels of the University community. We suggest these Leapfrog steps for promoting the University’s forward motion and leadership:

- Through globalism and internationalism, foster development of interculturally competent and socially responsible cosmopolitanism among students, faculty and staff.
- Through learning to innovate, create learning and research environments that better facilitate the creation, innovative application, and sharing of new knowledge.
• Through proaction vs. reaction, anticipate and build for preferred University futures rather than respond to current challenges and trends.

• Through leadership vs. followership, demonstrate the University’s potential and capacity to drive new genres of knowledge production in the 21st century.

• Through undergraduate knowledge production and innovation develop students that are not simply able to recall knowledge, but are also able to create new framings, meanings and applications of knowledge.

• Through raising staff productivity as knowledge workers, utilize the strengths of Leapfrog Campuses as diverse but collaborative learning organizations and build value for internal and external markets.

• Through innovative modes of knowledge distribution, identify, create and utilize new and future-oriented formats for sharing the knowledge constructed by Leapfrog Campuses.

However, we must temper our overall enthusiasm with some necessary and daunting questions:

How can individual campus units Leapfrog beyond choking rules and regulations?

Should we evolve a new leadership philosophy based on leading higher education systems rather than administering them?

How much creative chaos can be permitted and tolerated on Leapfrog Campuses?

How does a Leapfrog Campus create suppleness, initiative, and much faster reactions to threats and opportunities?
Do Leapfrog campuses require expanded forms of variety, such as interdisciplinarity, transdisciplinarity, and even post-disciplinarity (individual learning contracts)?

How much “requisite variety” (the variety required to succeed as a Leapfrog Campus) is needed to avoid sluggishness, brittleness, and decline?

Our concern is that colleges as such may not easily answer these questions, leading to the probability that selected components of campuses may develop into Leapfrog Campuses while others may not. It is appropriate to conclude this essay with beyond the horizon guidance from Ray Kurzweil, one of the world’s premiere artificial intelligence experts.

In 1999 Kurzweil proposed that advanced societies are moving toward the Technological Singularity, a transformation composed of ever briefer, overlapping S-curves of change. Such increasingly unpredictable rates and directions of exponential change were to be driven by ubiquitous, high-volume networks associated with integrated artificial intelligence and genetic engineering. Kurzweil’s projection included the assumption that, as the Singularity approached, software supported education would erode the teaching roles of faculty and propel them toward new roles in support of what we have chosen to call CIS, or continuous innovation societies.

Kurzweil projected a fascinating role for advanced learning systems: creating virtual realities on- and over-the-horizon to partially compensate for the reduced efficacy of forecasts and the impossibility of prediction. Kurzweil’s future is one that we have chosen to accept as a reality for knowledge-driven innovation societies. We believe it is already in an early stage of development, and has already strongly impacted the workforces of advanced societies. Such impact produced the knowledge industries, but rapid change is already demonstrating a growing
capacity to automate or off-shore much codified knowledge and the means to produce it. The CIS is a natural outcome of these processes, already long demonstrated in the automation and off-shoring of white collar information, industrial, and agricultural work, and now moving rapidly into knowledge and innovation work.

Every country will need all the help it can get to benefit from these changes and not be overwhelmed by them. Evolving toward Leapfrog Campuses could increase many fold the numbers of creative minds involved in knowledge production and innovation. It is our belief that no society can afford to ignore its youth -a largely untapped human capital resource- if it is to become or to remain globally competitive.

References


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