

Appendix A: Potential Manifestations of the Leapfrog University

The following documents contain examples that illustrate potential applications of leapfrog thinking at the University of Minnesota.

Examples of Potential “Leapfrogging” Activities

Arthur Harkins and John Moravec

A specific example of undergraduate knowledge production and application:

- Collaborative first-year seminars/laboratories that focus on the discovery and construction of new knowledge, including practice in its applications.

A specific example of leapfrog undergraduate activities based on knowledge production:

- Undergraduate-developed virtual enterprises are created in collaboration with on- and off-campus entities.

A specific example of a graduate curriculum model that produces KN production and leapfrogging:

- Graduate school creates transdisciplinary masters and doctoral programs, uncoupled from departmental “ownership.”
- Students design customized curricula and new “fields” based on their individual professional development needs, culminating in Plan B and thesis projects.
- Students develop portfolios of work and place these on the Internet.

A specific example of pedagogy to support curricula that can produce knowledge production and leapfrogging:

- An increasingly larger proportion of undergraduate and graduate classes become seminars, workshops, and laboratories intended to support knowledge production and leapfrogging.

How all of the above can move the University toward leadership rather than followership:

- Create a state of organizational chaordia* where the system is edgy and goal-generating through leapfrogging.
- University leadership will shift from administering the chaordic system to managing and leading it. Chaordia is defined as the creative ‘event horizon’ between chaos and order.

*Chaordia is defined as the productive relationship between creative chaos and contextual order.

To: Dean and Vice Provost Gail Dubrow
From: John Moravec, Ph.D. student, Educational Policy and Administration
104 Burton Hall, moravec@umn.edu, 612/325-5992
Date: March 7, 2006
Re: A proposal for transdisciplinary innovation in graduate education

This memorandum outlines my ideas for a transdisciplinary “Master of Innovation¹” program to be administered by the Graduate School and Provost’s office in response for your call for proposals for innovation in graduate education. The requirements from your request for proposals demand brevity. I therefore consolidated many of my thoughts into bullet points. If you, or any member of your team, would like clarification on any of these items, do not hesitate to contact me at any moment during your selection process or afterward. I am committed to the success of these ideas and look forward to your feedback.

Description of the initiative proposed

“Traditional” students comprise the student bodies of today’s universities. Increasingly, however, universities are finding they will need to market and deliver educational products to life-long learners. As knowledge workers, students will no longer be content to learn and practice in discipline-specific environments. Future students will increasingly demand personalized education that meets their individual human potential development needs. Interdisciplinary and *transdisciplinary* approaches to knowledge transfer and production are critical for the success of individuals and organizations in an economic reality that is increasingly demanding of innovation. As a large “Research I” university, the University of Minnesota must strategically position itself to leverage its knowledge capital toward the development of innovative, new knowledge production.

I propose that the Graduate School, in coordination with the Office of the Senior Vice President for Academic Affairs and Provost, create a *Coordinating Office for Transdisciplinary Programs*. The office, reporting to both the Graduate School and Provost, will administer a transdisciplinary, master’s level program that will enable students to maximize their individual, innovative knowledge production potential.

Because successful completion of the proposed program is dependent on the individual student’s personal leadership, admittance to the program will be competitive and dependent on the prospective student’s demonstrated history of leadership as well as intellectual achievements. Prospective students accepted into the program are required to select two co-advisors from two different academic departments for their designed field of study. If the advisors concur that an existing program could meet the student’s needs, the student would be required to instead apply for or transfer to the existing program. If no developed field of knowledge presently exists, the student, in consultation of the

¹ This is a suggested title, and may need to be changed in the future to avoid confusion with the existing Innovation Studies program.

faculty advisors and Graduate School will develop a customized academic program, combining core coursework from the relevant contributing fields in addition to elective coursework of the student's choosing.

At the end of the program, the student will submit (and defend) either a professionally-relevant portfolio of work completed (Plan B) or a Plan A thesis. Following the successful defense, the Graduate School will award the student a "Master of Innovation" in the field of their creation (e.g., "Master of Innovation in Educational Business Design").

Audience that will benefit from this proposal

The audience that will benefit from this proposal involves all stakeholders and actors that are involved in innovative production in the emerging knowledge economy. These individuals and organizations include (and are not limited to):

- Present and future knowledge workers and innovators
- Traditional and non-traditional students
- University faculty and staff
- Businesses
- Governments (local, state and national)
- Non-governmental organizations

Expected impact

The intended outcome of the proposed program specifically meets the Graduate School's goals to a) innovate in the design of graduate education to produce excellent student experiences and outcomes; and, b) develop institutional policies and practices that facilitate interdisciplinary teaching, research, and training in graduate education. By focusing on individual knowledge production, the program also complements the Graduate School's diversity initiatives. Additional outcomes include:

- Demonstrate that the Graduate School and the University of Minnesota are leaders in innovation-based education.
- Produce professionals that are leaders in the innovative fields they create.
- Create new value networks and knowledge networks within and beyond the University.
- Contribute to the continued socioeconomic growth of the State of Minnesota through innovative research and education.

Steps needed to implement the new initiative

Please see "proposed project timeline," below.

Evaluation criteria

Products generated from the implementation of this proposal are intangibles and are therefore difficult to quantitatively evaluate. As part of the program's operation, a supervisory committee will need to be formed to determine criteria for evaluation, evaluate the program and provide recommendations for improvement. Long term evaluation criteria should include:

- Change of University and Graduate School ranking in international surveys.

- Amount and quality of innovative knowledge and innovative application of knowledge produced within University.
- Impact on socioeconomic development in Minnesota, nation and world.

Implementation partners

Implementation partners in the formation of a coordinating office would span University-wide leadership and will include the active collaboration of:

- Graduate School
- College deans
- Office of the Senior Vice President for Academic Affairs & Provost

Estimated cost of implementation

The most significant initial development costs would be from several FTE adds to Graduate School staff: Director of Transdisciplinary Programs, marketing coordinator/specialist, and support staff. Additional funds will need to be budgeted to cover overhead operating expenses and an initial marketing budget. Program costs may be recovered through student enrollment fees. Through new industry-university collaborations, operating costs could be further reduced, and transform the program into a profit center.

Proposed project timeline

An ambitious timeline for this project is proposed:

- *Now - Fall 2006*: develop finalized implementation plan, hire staff for Coordinating Office
- *Fall 2006*: Open Coordinating Office for Transdisciplinary Programs reporting to the SVP for Academic Affairs and Dean of the Graduate School
- *2006-2007 school year*: begin program development for colleges and faculty, begin nationwide publicity and marketing efforts
- *2007-2008 school year*: pilot program with up to fifteen students to develop best practices in the program, identify problems that may emerge, and provide effective corrections
- *2008-2009 school year*: program operates at full capacity

Prognosis

The creation of a truly transdisciplinary graduate program will propel the Graduate School of the University of Minnesota into a leader of knowledge production and innovation in the global economy. The focus on each individual student's interests and potential will produce more positive student experiences and provide a framework to support active, responsive knowledge production and distribution from underrepresented groups. This model will help the University become one of the top three research universities in the world in the next decade and beyond.

Appendix B: Brainstorming Notes

The following brainstorming notes are an example of leapfrog thinking being done by an academic unit that is investigating the creation of a novel advanced professional degree program.

Title Alternatives

- Leadership in Knowledge-Oriented Organizations
- Strategic Educational Leadership
- Strategic Information and Knowledge Leadership
- Strategic Global Education & Knowledge/Innovation Leadership
- Human capital development

Assumptions

- Cross-Disciplinary using resources of U of M local and international communities.
- Cross-Program U.S. and International Business Systems Design and Management.
- Serve knowledge-based economies (or those trying to become).
- Create knowledge and innovation workers.
- Designed to serve knowledge-based economies and create knowledge-innovation workforces.
- Learning collaborative format (LCF)
- Create and manage complexity
- Create a knowledge and innovation workforce.
- Create knowledge and innovation leaders
- Synchronous/asynchronous format.
- Discuss, discover, create trends and normative futures in global education, organization.

Scope: Global Markets

- Academic Sector
- Military Sector
- Private Sector
- Private Sector (HRD)
- Government Sector
- NGO's
- P-K-12
- Tourism
- Retired/Boomers
- Mass Communication Media

Issues/Factors/Considerations

- ICT
- Knowledge systems
- Innovation
- Creativity
- Knowledge management leadership
- Knowledge production management
- Knowledge distribution management
- Cultural design
- Strategic global leadership
- Reflective/creative thinking
- Policy formation and analysis
- Strategic research and development
- Systems assessment and evaluation
- Global systems dynamic (communication and travel)
- Competitors and collaboration in global context
- Strategic systems thinking
- U.S. and international business systems designs and management
- International law
- Risk management
- Anticipatory systems
- Entrepreneurship

Appendix C: Selected Comments Received

Electronic comments received from participants and other persons are included in this index. Unless if given explicit permission to share personal information, names are hidden.

In response to version 1.0 from a state legislator:

Mon 2/20/2006 10:17

John and Arthur,

I have read your press release and proposal. I congratulate you on moving forward with a concept that is fresh and aggressive. I would caution however, that if you try to move within the current structure and system, you are fated for failure.

Consider creating small, flexible and responsive substructures within a few critical departments that have complete autonomy from the department proper. As long as "innovation" is answerable to the existing system, innovation will always be stymied and the system will revert towards the status quo.

Just a thought. . . Good luck.

In response to version 1.0 from an academician outside of the University community:

Mon 2/20/2006 12:09

hi art

I am not certain what you and moravec mean about leap frogging and who you are aiming this at faculty or administration. and what do you think this will lead to?

keep me posted.

there are some changes blowing in the wind and some leapfrogging at a number of levels internationally. what it will take for the univ to leap frog the leap frogs or to survive in the rapids of change will prove interesting.

i think the State has already made some very creative leaps to give the U that edge what more might imagination find

In response to version 1.0 from a University staff member:

Thu 2/23/2006 10:45

John,

[...]

In reading your proposal, I think there are a few pieces missing:

- 1) In your discussion of "stimulating the involvement" (bullet 2), I think you are missing a significant and largely untapped segment of the university population-

staff who are also students. It is tempting to seek outside input & experts when attempting bold changes, but what would happen if the University made a more concentrated effort to learn from the people who work closely at the University level AND learn within it? I would add this group to "the involvement of first-rate retirees, volunteers, alumni, & creatives"... I guess I'm thinking of this as the Harvard vs. Japanese rugby team [...] talked about today...

- 2) I think the press release helps the outside critics understand the context of UMN in a grander context, but there is other data missing. I have yet to see anything describe and define what a "top 3 research" public institution is. Synergy and being more interdisciplinary are critical pieces, but those words are just ways of making groups be more resourceful with less resources.
- 3) Since you want the media to buy in to this, I would look at angles that appeal to the individualistic nature of the general public. What does "leap-frogging" mean to joe-taxpayer? [...]
- 4) There are programs already at the University that are considered to be # 1 in their respective fields (i.e. Child Development, WHRE Tech Ed, Law school is #19) What can the broader University learn from these schools/programs/depts. and apply it to the University as a whole?

In response to version 1.0 from a University staff member:

Sun 2/26/2006 20:40

A couple more thoughts...

1) How can companies like 3M, Honeywell, General Mills & Gillette contribute to "leap-frogging"? What is unique about the ties these international (GLOBAL!) companies have to UMN?

2) The admissions office loves to play up that fact that the University of Minnesota is the largest URBAN campus in the United States. Diversity is also part of the sales pitch. I guess I'm thinking of the bridge connecting the west/east bank...I've always thought that is a cool symbol of the diversity & presence of the university in the city. What if that "bridge" didn't exist-how would knowledge & ideas be shared? Even the passive advertising tells a story & communicates identity. How could the geographic location of the campus contribute to Bruininks vision? Leap-frogging? Becoming a top 3 research institution?

In response to version 2.0, posted on the Education Futures blog (www.educationfutures.com):

Wed 3/8/2006 06:22

Please consider the performing arts for a possible model of individualized faculty/student relationships. My two studio teachers were the guiding force behind my secondary and

undergraduate degrees. This seven-year relationship to extraordinary expertise formed me much more so than the content and provided a seamless transition to undergrad work even though that period spanned the years 1975-1982 and two states. A self-generated learning contract each semester was just part of the normal scope of life and included suggestions for designing extra-curricular activity (i.e., “You won’t understand this music until you’ve heard Mr.X play it live, and fallen in love with someone”). My present doctoral work has a more codified (albeit less adventurous) learning plan. It is called the dissertation proposal.

It seems greatness lies in managing the fundamental tension between fully individualized knowledge generation and the continuous development of the human condition (i.e., all of us getting along). For me, my artistic training was fundamental to both.

In response to version 2.0 from a doctoral candidate:

Thu 3/9/2006 09:29

Interesting concept. I'm glad that you are requesting ideas for application to university improvement; I think the document would be improved most by reaching toward the concrete ground of examples throughout.

As a doctoral student who has often felt unduly constrained by requirements within my department and program, I decided to concurrently enroll in the Masters in Liberal Studies (MLS) program in order to secure some support for a more interdisciplinary approach to my own learning. Additionally, when frustrated by the lack of attention by my Ph.D. program's faculty to what I consider to be a central issue to the future of our discipline in society, I gathered peer involvement in a faculty-less doctoral seminar on the topic, inviting outside resources from outside the department and outside the university.

I wonder what kind of progress in thinking we might make if some parallel to what I have done were institutionalized and supported directly. What if doctoral students were as a matter of course invited to identify important questions not being addressed by their own faculty, either in terms of research or teaching, and to come up with some plan for learning in those areas? This might shift our understanding of what it means to earn a Ph.D.

from one of emphasizing learning and producing knowledge to a greater emphasis on considering and generating important questions, on meta-analysis of the very disciplinary map upon which we are asked to base our own routes and borders.

A separate suggestion follows from the concept of open sourcing, and is one which was raised as a topic of discussion during the graduate assistant unionization campaign. This idea is simple: make available to all eligible graduate assistants a comprehensive list of assistantships to be filled in the following term, including those

within and without the department (perhaps limiting the breadth to single colleges) and provide this list by a date which ensures that students have a chance to present their interest and qualifications for any position. As it currently operates in my department, the only positions which we hear about are A) those which our advisors and our faculty feel are right for us individually (or perhaps right for others, more cynically); and B) those which apparently no one immediately wants and which therefore need to be posted more publicly to recruit a taker. Collaboration is not present in this system so much as hierarchical (and controlling) thinking. I wonder if everyone's interests would not be better met by inviting all stakeholders to participate in the overall puzzle.

Those are my specific thoughts. While I realize that your document has a broader scope, I wonder if having a wealth of more concrete examples of application of principles would not strengthen your document.

Appendix D: Workforce Transitions and Human Capital Development

These heuristic scenarios of workforces and their supporting technologies are intended to convey a remarkably profound shift away from learning and performance as ends in themselves in favor of continuous innovation as a process of working, living and learning. A major casualty of such change is the loss of stability in the job market and parallel growth in the opportunity or work market.

WORKFORCE TRANSITIONS AND HUMAN CAPITAL DEVELOPMENT

Prepared by Arthur Harkins and George Kubik

Five learning approaches

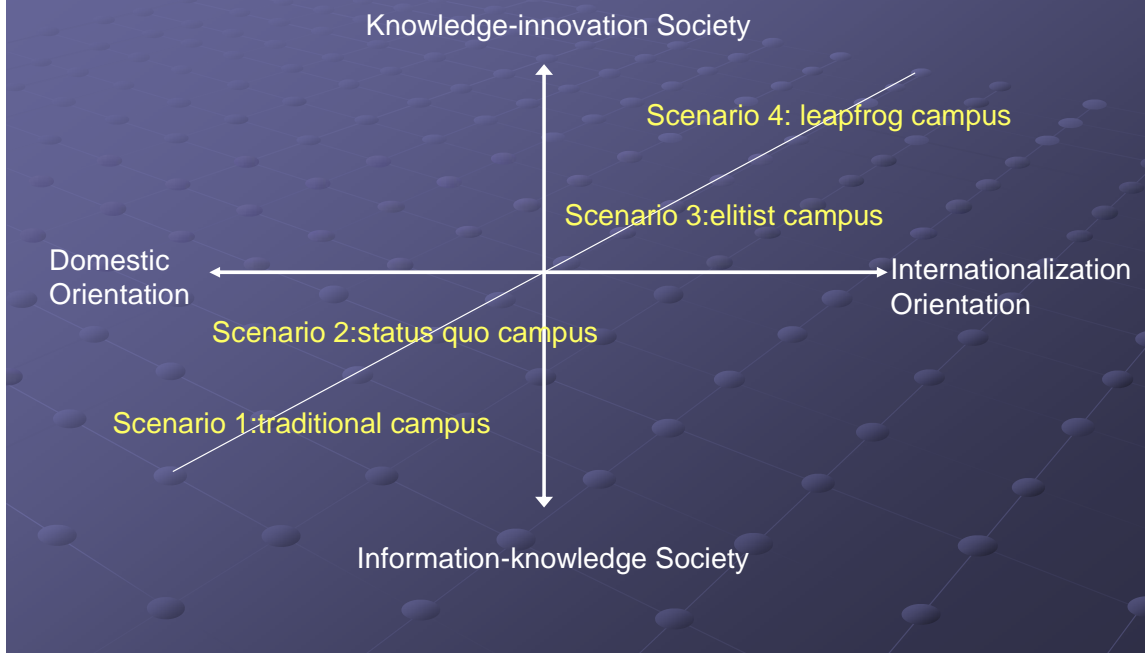
Learning system attributes	Earlier industrial training	Generalized mass education	Information/knowledge transition	Cybernetic supports: Person-focused electronic performance support systems	Performance/innovation-based learning for Continuous Innovation Society
Primacy (learning is performance)	Performance (learning is secondary)	Learning (performance is secondary)	Performance (performance is focus)	Performance (learning is unnecessary)	Creativity, innovation & learning are synchronous
Purpose	Prepare individuals for specific task performance	Prepare individuals for general task performance	Provide explicit information to enhance performance	Guide performance	Advise, consult, guide, facilitate, perform-for, innovate-with
Approach	OJT preparation	Class preparation	Inform	Coach (perform-with-for)	Partner, innovate-with
Occurrence	Episodic instruction	On-going tutoring	On-demand information	On-demand performances	On-demand innovations
Focus	Group cohort	Age cohort	Group (organization) members	Employees	Integrated systems within contexts

Basis	Informal training program	Academic curriculum	Electronic information base	Software-based explicit knowledge	Individualized creativity within chaotic, emergent context
Learning sequence	Learning occurs prior to performance	Learning occurs prior to performance	Need-driven	Event-driven	Continuous (concurrent and post-performance)
Delivery platform	Human & machine-based	Human-based	Machine-based (electronic information base)	Agent-based for individuals-in-context	Agent- & human-based upgrades of distributed competence software
Learning initiative determinant	Trainer determines how individuals will learn	Teacher determines how individuals will learn	Need-driven	Event-driven	Learner-tool-task-context co-determine nature of innovation base learning
Context	Context dependent (partial)	Context independent	Context independent	Context dependent	Context creative
Person dependency	Muscle-command worker enticed to repetitive labor	Brain-information worker enticed to repetitive work	Mind-knowledge worker asked to adapt continually & to innovate occasionally	Software-backed knowledge worker choosing to adapt continuously & innovate frequently	Students are strategic, innovative, & knowledgeable, generating new information, automating DC software, & continuously innovating in new contexts, software, & PBL
Delivery location	OJT/classroom	Classroom	Computer node	Software network nodes	Anywhere, anytime, anyplace (user, task, context-determined)
Delivery time	Unscheduled/scheduled	Scheduled	On-demand (anytime)	On-demand (anytime)	Continuous (anytime)
Performance	1. Individual cognitive	1. Individual	1. Ability to use information	1. Ability to use	1. Motivation of user

determinants	aptitude/motor skills 2. Quality/quantity of training	cognitive aptitude 2. Quality/quantity of education	base 2. Quality of information base	performance support systems 2. Quality of performance support systems	2. Quality of DC, PBL & PBI systems 3. Quality of interaction with context
Workforce implications	High relevance, but usually lags behind needs	"Just-in-case" relevance; sometimes only chance of applicability	High situational relevance but very inefficient to store or access due to information mgmt. limitations	High situational relevance; essential for supporting PBL	Uploaded situational competence/innovations to points of need "just-in-time" or "just-ahead-of-time"

Appendix E: Misc. Materials Submitted by Participants

Four Scenarios



From **Yuki Watabe**, Ph.D. student, Educational Policy and Administration, University of Minnesota, e-mail: wata0028@umn.edu