Toward Higher Ground:

new visions, new voices for the 21st century

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Thinking Education: The Challenge of Higher Education in the High-Velocity World

JIM CARROLL, futurist and author, said he would talk about the future of education, first setting the stage by describing what he calls "the high-velocity economy." He sees very rapid, continual change ahead; those organizations with the ability to deal with it will succeed.

Carroll listed a number of corporations and organizations for which he has provided guidance as a futurist, including the Disney Corporation. "They are one of the most innovative and creative organizations on the planet, but they too are experiencing an environment that is rapidly changing." Entertainment and broadcasting industries are seeing high-velocity change in terms of consumers, products and delivery of products. Carroll shared an example: "Disney has gone from zero dollars in revenue from the Hannah Montana show to $2.5 billion in revenue just in the past five years." Carroll is confident that being able to adapt to high-velocity change will be as critical to success in education as it is in all other realms.

Carroll described a report from Australia that was produced by government, education and business leaders who were working to determine what Australia would need to do to try to keep up in terms of global competitiveness. "Buried in the report was one of the most fundamentally profound observations I have ever seen, and it came from their education system. They concluded that 65 percent of current preschoolers will ultimately work in jobs or careers that do not yet exist. … How can higher education continue to do the same things we are doing today when we are facing such rapid change in the future? How do we align ourselves with a mindset in which we can change and evolve faster?"

Carroll said a recent U.S. study "estimated that half of what one learns in the sciences the first year of college is revised or obsolete by the time one graduates four years later. How can higher education deal with that reality?" He indicated that the rate of change in discovery and innovation in technology leads companies like Minolta to consider a digital camera to be obsolete six months after it comes to market.

Carroll shared the following quotation from Rupert Murdoch: "The world is changing very fast. Big will not beat small anymore. It will be the fast beating the slow."

"Our ability to innovate, to do things differently, will define our success in the future," Carroll said.

Carroll then spoke about the current economy. "We have been on a roller coaster for months; it has been relentless. We wake up each morning to a new world of terror driven by economic headlines. The most important thing you can do right now is to *focus on the future*. Economic recovery is only a matter of time."

Carroll indicated that we have three choices at this point:

- We can panic.
- We can do nothing.
- We can choose to innovate, change and adapt.

"When you go back to your institutions after this conference, you need to focus on the third option. The first two simply do not make sense.

"I have been likening our reaction to the fast pace of economic meltdown to the stages of bereavement: shock, denial, anger, bargaining, depression, testing and acceptance. You need to ask yourself where you want to place yourself in the seven stages of economic grief. I say we need to move beyond anger and denial to acceptance that it is a different world. We can move to the acceptance stage more quickly by focusing on the future and the opportunities ahead.

"The future of higher education is huge." Carroll shared the following observation from Microsoft: "Probably about 50 percent of the U.S. gross domestic product will be taken up by training and knowledge activities within the decade." Carroll then spoke about what is happening with "the knowledge economy." The reality is, he said, that "American workers today, whether in a trade or profession, are in a situation in which the knowledge they have is continuously going out of date and needs to be continuously replenished. What is there to be concerned about when we have such massive growth potential?"

Carroll presented the following observations about current trends in knowledge, as well as questions that those in higher education should ask themselves based on these trends:

1. **Knowledge is growing exponentially.** For example, the rate of discovery based on research into gene variants for common diseases is increasing rapidly: One or two were discovered each year beginning in 2000; thousands were discovered in 2007. "This knowledge reorients the entire medical system, from one where patients are treated once they are sick to one where patients are treated for what they are likely to develop as a result of their genetic makeup. The volume of medical knowledge is doubling every eight years, and similar changes are occurring in other trades and professions." *How is our fundamental business model challenged by exponential growth? Should we continue to focus on providing a fundamental body of knowledge over four years of higher education and then send graduates out into the world?*
2. **The foundation of knowledge generation has changed.** Academia was once the home of most of the fundamental research that occurred in the world; a majority of new discoveries took place in the world of higher education. "Higher education is no longer the central force in the generation of knowledge," Carroll said. "There are different terms for what has replaced it: peer-based knowledge, community knowledge or the infinite global idea cycle. For example, in terms of

renewable energy and green technologies, some of the research and development is occurring in the world of academia, but it is also occurring in the global idea machine. Ten years ago, knowledge generation was based on peer-review journals (a slow, careful and deliberative process) — but today, backyard tinkerers are plugged into a global network of peers. The impact of this trend is that the rate of scientific discovery speeds up; the new way leads to much faster innovation." *What is the role of traditional academia in the era of community knowledge? How should our business model change to respond to this new reality?*

3. **The velocity of knowledge is accelerating.** The typical video game makes 60 to 70 percent of its money in the first four or five days after it is released, Carroll said; everything is focused on maximizing revenue at the beginning. The next generation of televisions, LED televisions, is expected to have only 18 to 24 months to maximize revenue before they are obsolete and replaced by the next generation of televisions. "Ideas can go from concepts to an industry literally overnight," he said. "Anyone can put an idea out into the global idea machine where someone else can grab it and build on it. Knowledge is being impacted by velocity." All areas are affected; for example, in construction, new methods, new materials and new priorities, such as eco-design, are changing the way buildings are built. In every profession and career, the ability to keep up with new knowledge and to act upon it defines success. College graduates will encounter constant change in their work lives. *Can we challenge ourselves to deploy knowledge faster? Or do we have a fundamental business model that is slow to react in a world that is quickly catching up?*
4. **Exponential growth of knowledge leads to massive career specialization.** It increases the volume of knowledge workers are expected to have, Carroll said, and it speeds up the pace of developments that can impact careers. "If knowledge is doubling every eight years, no single person can keep up with it. That fosters greater fragmentation of skills, and thus greater competition in the marketplace for niche-oriented skills." For example, in terms of the trades, there is a huge volume of new technical knowledge to master. There is a niche for manufacturing engineers who understand all the new manufacturing methodologies and thus can help companies compete with offshore manufacturers. There is a need for manufacturing engineers who are "process transformation specialists," focused on how to streamline an existing manufacturing process. "We are reaching a world in which everything around us is getting plugged into everything else. And as everything is getting plugged in, manufacturing is fundamentally changing." *Is our future narrow in terms of what we deliver? Is our future wide? Do we focus on narrow niches, wide areas of knowledge, or both?*
5. **Fundamental structural organizational change is occurring.** How we think about careers and jobs is undergoing a substantial change. There are unique ideas as to what constitutes a career, Carroll said. "Evidence of this shift is that

baby boomers tend to ask, 'What do you do for a living?' while those under age 25 ask, 'What do you like to do?' Watch for this. The new generation prefers to get work done in odd hours, using BlackBerrys; they care less about structure. They define their lives not by what they do for a living, but what they like to do. It is a fundamental, significant transformation — and I don't think we appreciate the depths of what it means in terms of the future of knowledge." Carroll shared additional insights from a survey of recent graduates in the emerging workforce:

- More than 50 percent think self-employment is more secure than a full-time job.
- They think two to five years is a "long-term career."
- Sixty-seven percent admitted that on the first day of a new job, they were already looking for their next job.
- They have short attention spans and expect multiple experiential careers.
- They know they will need continuous, regular knowledge replenishment to help them deal with that reality.

"But it's not just happening with them," Carroll said. "There is a prediction that in the U.S., 60 percent of consulting engineers will be freelancers — nomadic workers for hire — making their specialized skills available to organizations on a just-in-time basis. Do you think a lot of Fortune 1000 companies will hire full-time employees after the current economic situation is resolved? No, because they will recognize the cost of employees in terms of health care and other long-term investment. Increasingly, American workers will become nomadic workers for hire. We are witnessing the end of the concept of the organization as we know it. As far back as 1987, an op-ed in the *New York Times* referenced a 'world without walls,' where corporations would hire people with specialized skills on a demand basis. What's fascinating here is that we are seeing the development of the extreme specialist at the same time that we see the emergence of the extreme knowledge generalist." Carroll referred to "hospitalists": People who understand all the medical specialists and understand how hospitals work; their role is to guide patients through the increasing complexities of the system. This career is expected to grow from the current 12,000 hospitalists to 130,000 by 2010. *We have to acknowledge these two key trends — the fast emergence of niche skills deployment and the emergence of masters of generalization — to determine how to educate people to simply understand the high-velocity knowledge niching that is occurring in the world today.*

6. **By 2020 or sooner, it will be all about "just-in-time knowledge."** "In a world of fast knowledge development, none of us will have the capability to know much of anything at all," Carroll said. "The most important skill we will have will be the ability to go out to get the right knowledge for the right purpose at the right time."

Carroll then shared 10 key trends in the current era:

- Rapid knowledge obsolescence
- Rapid knowledge emergence

- Disappearance of existing careers
- Rapid emergence of new careers
- An ongoing need for continuous knowledge replenishment
- The migration of knowledge generation further away from academia
- A massively increased challenge from overseas knowledge generation
- The fast emergence of new "micro-careers"
- An economy that succeeds through knowledge deployment
- A fundamental transformation in your role

"The information presented last night paints a picture of what can happen if we don't do a better job of knowledge deployment throughout this economy, in the context of how quickly things are changing." Carroll explained that the high-velocity world is pushing toward just-in-time knowledge, which will lead to "fundamental changes in the typical, centuries-old relationship colleges have had with students. Today we are in a situation where we have a very short and concise knowledge relationship. But that is not the reality of the world students are graduating into." Carroll reiterated that workers' ability to get the new knowledge they need throughout their careers "will have a fundamental impact on the future success of this nation in the global economy. So does the role of higher education need to change to one related to the lifelong, ongoing replenishment and rejuvenation of knowledge? That is a massive shift. But, as Molly Broad said last night, this is the time for change, a time to challenge our assumptions and habits."

Carroll asked, "How do we adapt to this new reality? Innovation is absolutely critical. Are you Chrysler or Honda?" He described how Chrysler tears down and rebuilds its factory lines once a year, and then tries to sell the 700,000 cars it turns out. Honda can retool in two to three days and produce those cars that are currently selling. One company does the same thing over and over; the other reacts rapidly and with agility to changing circumstances.

Carroll then listed some of the excuses — "innovation killers" — that people in organizations will make if they are not innovative:

- We've always done it this way.
- It won't work.
- That's not my problem.
- You can't do that.
- I don't know how.
- I don't think I can.
- That's the dumbest thing I ever heard.
- I didn't know that.

- The boss won't go for it.
- Why should I care?

In conclusion, Carroll listed what the participants should do to be innovative and take advantage of future opportunities once they get back to their campuses, playing on the themes he introduced throughout his presentation:

- Observe
- Think
- Change
- Dare
- Banish innovation killers
- Try
- Question
- Grow
- Do
- Enjoy

"I have found that those people who focus on the future and its opportunities — who do the first nine things on this list on a continuous basis — are the ones who enjoy their work and approach the future with enthusiasm and relish," Carroll said.

The audience then had a chance to respond. Bruce Poch, vice president and dean of admissions, Pomona College, commented, "What I just heard was a complete defense of liberal education in the United States. It is not the development of specific knowledge and skills but the development of critical thinking that will lead from one innovation and change to the next. So, thank you."

Steve Handel, senior director of higher education relationship development, the College Board, asked Carroll how he keeps up with current trends and what's ahead. Carroll replied that he listens, does research, communicates with people in many different professions and asks questions.

Janet Irons, senior associate director of financial aid and senior admissions officer, Harvard College, asked, "My guess is that our knowledge about *Beowulf* is not 'exponentiating.' Do you see a growing bifurcation between what we learn in humanities and what we learn in the sciences and, if so, what does that mean in the future in terms of how they are taught and who needs to learn about both?" Carroll replied, "A lot of what I am talking about is the scientific-driven impact of where we are going with knowledge. But the concept that I keep going back to is just-in-time knowledge. We should be teaching students how to learn, to learn faster and to get the right knowledge for the right purpose, regardless of their degree program; we need to equip them with the capabilities to keep upgrading their knowledge."

Mabel Freeman, assistant vice president for undergraduate admissions and first-year experience, The Ohio State University, said, "You did not address political structures and how they can get in the way of innovation at big public universities." Carroll responded, "Government is a ponderous process; I hope the new U.S. administration will innovate. Something needs to change; we need to do things in a new, faster way."

Tom Weede, vice president of enrollment management, Butler University, asked, "What does all of this have to do with the future of tenure?" Carroll replied with his own question, "Will the ingrained fundamental cost structures of academia permit us to go forward into this future in which we need to do things quickly? I think if we look back 10 years from now, we will have witnessed some significant changes in tenure. I think endowments that have collapsed by 30 to 40 percent will have a significant impact on that."