

From: Pierre Pierre, CEO
Spatial Thoughtware, Inc.

Dec 22, 2011

COMMENT 1

We are a small, innovative startup developing Algorithmic Geometry education for high school 11-12th graders. This is a best-in-world (in the 9-12 educational sector), cutting edge modernization of spatial problem-solving. Algorithmic Geometry is interdisciplinary Math-Computer Science, teaching the practice of mathematics as done in the spatial applications software industry. I'm attaching a recent NSF Proposal Summary.

The point of view we represent is probably the extreme in core mathematics curriculum innovation - what we call Math Education for the 21st Century.

The signal strategic issue: Our goal is to give U.S./Canadian students a quantum leap forward in their Math problem-solving knowhow (the "standard" math curriculum having fallen decades behind high-tech industry in its portrayal of how mathematics is actually practiced.). That is, the goal of the project is NATIONAL competitiveness. WE ARE NOT DOING THIS PROJECT TO DEVELOP STUDENTS IN INDIA, CHINA, RUSSIA, ISRAEL, TAIWAN, KOREA, IRAN, etc.

What does it mean to "Publish" results? How to maintain Comparative Advantage for U.S. students?

How can high-impact, cutting edge breakthroughs in Education be managed so as to give U.S. students comparative advantage? This question boils down to: How can we manage the dissemination of cutting edge breakthroughs so that they have time to benefit U.S. students before getting out to the rest of the world?

Clearly, the notion on "publishing" needs to be challenged as too non-selective a means of dissemination. Anything that is published is globally disseminated in this era where nations like China, India, Iran are constantly scouring the Internet to pick up innovations for free. U.S. taxpayers have every right to insist that the benefits of educational research be enjoyed preferentially by U.S. students. Why else would they be spending their tax \$ on R&D? To help kids India and China get ahead, and sell their knowhow underpricing American workers? You may want to do a poll or focus group with average taxpayers to get a clear justification for taking the complicated steps needed to design a national dissemination system.

How would a national dissemination system work?

The US needs a National Research Intranet (similar to how a large multinational manages its proprietary IP). At minimum, this is a password-controlled system that uses VPN communications, and has safeguards against theft of laptops, mobile devices and desktops. It needs a highly-skilled security team involved in its design and operation. There needs to be a legal framework (Congress needs to get involved) defining National IP Assets. These are IP assets owned both privately by US companies, jointly with the USG, or USG exclusive. There should be a National IP Director who reports to the President. Treaties and Trade Agreements must be explicitly approved by the National IP Director during their negotiation, to maximize long-term US Competitiveness.

Time spans. The US would keep the wraps on its most cutting edge scientific, engineering, and educational innovations for a reasonable period of time during which competitiveness was established and enjoyed in the US. This could be 5 years for some projects, 10 years for others. The time period should depend on how much time it takes to fully implement the innovation plus several years of exclusive advantage. Ideally, around the time just before the IP

is to become obsoleted by something much more powerful, that's when it should be released globally (or "published").

Graduate Student access to National IP. Grad Student education is one of the "leaky" faucets whereby U.S. taxpayers are subsidizing foreign competitor workforces. The rules need to be tightened up so that National IP Assets are safeguarded in our Universities. Many academics (secure in their employment) tend to be "globalists", insensitive to the economic challenges experienced daily by their fellow Americans who have to compete in a lowest-cost global labor market. The ultimate insult is to use these taxpayers money indiscriminantly educating grad students who will take the benefits home, from where they can undercut U.S. labor rates. The USG must separate itself from this unhelpful attitude on the part of academics.

The more transformative and powerful the breakthrough, the longer it should be kept under wraps. Much of the incremental (paradigm-extending) research could be published earlier. The challenge for the USG is, can USG scientists determine on their own what constitutes the more transformative projects vs. those of lesser impact? Usually, only the proponents of radical innovations can make this recognition early on. A "crowd" review within the Intranet is likely the best way to be deciding national R&D investment priorities in the future. The USG bureaucrats have to first learn how to engage and trust the broad scientific community in making wise choices. Clearly, a secure National R&D Intranet would be needed to begin harnessing crowd-power.

Summing up, the essential policy question is, how can the fruits of taxpayer-funded R&D maximally benefit the U.S. workforce (preferentially over global competitor nations who are actively, illegally stealing IP from the U.S.? A national R&D Intranet, modeled upon the best corporate Intranet designs, is the solution to this problem, combined with some "period of exclusive advantage" as National IP, after which innovations would be published to the world.

If you would like my help developing this further, just ask.

Pierre Bierre
Director, Algorithmic Geometry Project
CEO, Spatial Thoughtware
Math Education for the 21st Century