Practicing Global Openness in Education: From Elementary Schools to Graduate Schools

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Abstract

An experience-based summary of global open education is presented solely for promoting its practices. My life has been benefited from practicing open education, first at an elementary school and later at a graduate school. The openness has been local because of the lack of globalization mechanisms in education. It is fairly recent that we have effective global educations mechanisms for global interactivity and global two way communications such as the web and cyberspaces. Compared to local open education, global open education removes the boundaries of ages, organizations, nations, sexes, and disciplines. Many unseen barriers exist to prevent global open education, mostly originating from survival intuitions and fights embodied in life itself. Since the barriers are rooted in the nature of life, it is hard to practice global openness in education. Hence it is important to cooperate for us to practice it to see real advances in our knowledge.

1. Public education: The dawn of global education as the foundation of a national business model

Historically it has been distinct that *public education* has served as the fundamental mechanism of the power shift to a public nation from an aristocratic country. Many republics and even public government-based empires have been created by this mechanism to recreate ever expanding bureaucrats and private enterprise leaders to govern such nations[1*, 2].

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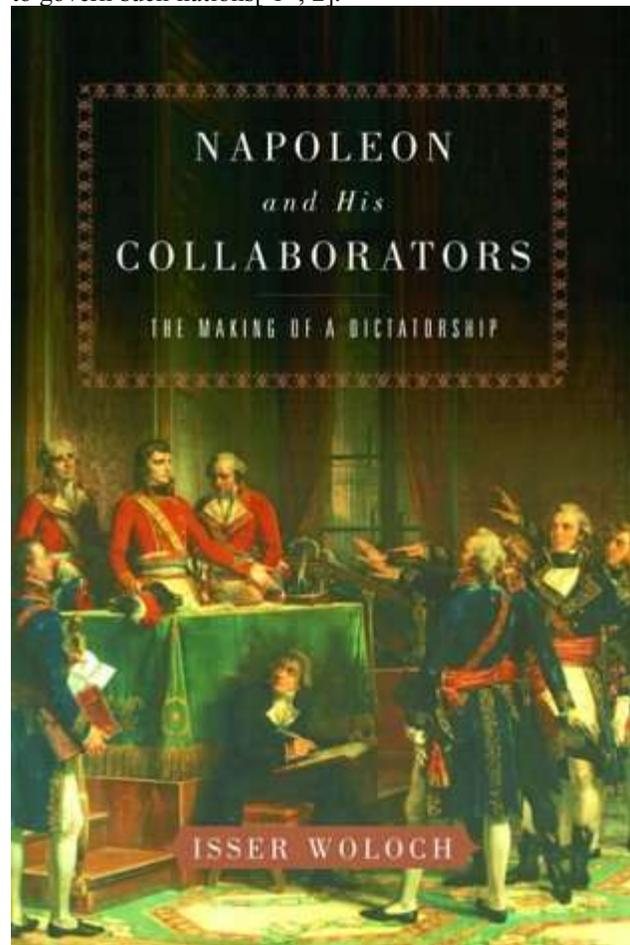
*[1] One typical case is that of Napoleon Bonaparte. An encyclopedic description states what he had as a national business model to use public education as a key mechanism: "In 1808, when Napoleon reorganized the French educational system under the jurisdiction of the University of France, the University of Paris was reopened. Faculties of literature, law, medicine, and science, together with a later-abolished faculty of theology, were established at the Sorbonne, which had been designated the seat of the academy of Paris (one of the 17 educational districts into which France

was now divided) and the seat of the University of Paris itself. A library was established at the Sorbonne in 1808; its collection today numbers more than 3 million volumes. Under terms of the Orientation Act of 1968, which reformed French higher education, the university was reconstituted as 13 autonomous teaching and research faculties. These were founded during 1968-71."

   As the contents of public education, the main successful line on top of literacy has had the skeleton:

   Science -> engineering -> commerce -> finance
for accelerated formation of national power. Needless to say, there have been a military educational line. Ironically, too powerful weapons to destroy the entire meteorology of the globe and then the entire life on the earth [3,4], has made this line basically ineffective and obsolete, although still practiced.
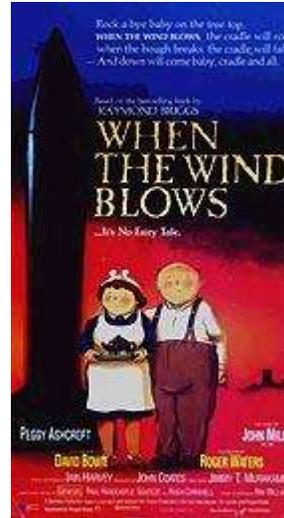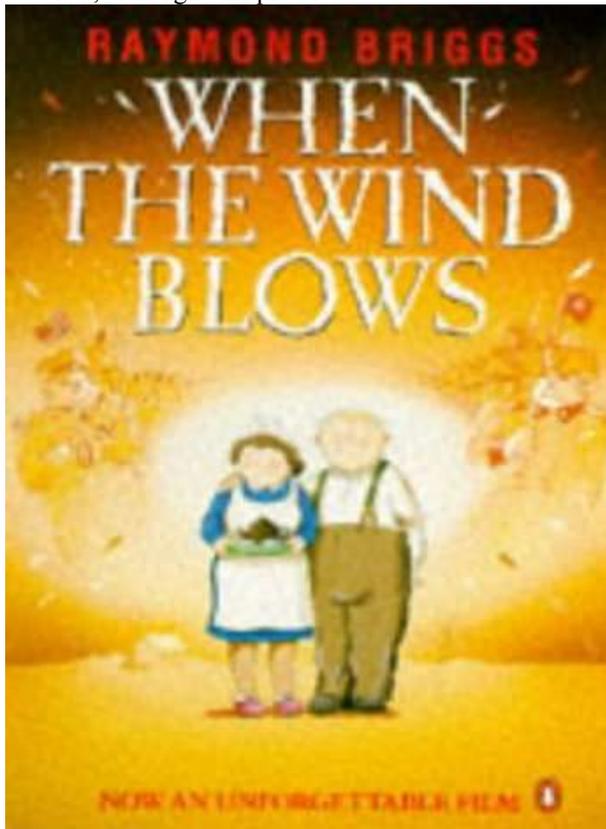
2. Research universities as a spirally growing national business model

   The notion of the *research universities* was coined as a national business model by 16 American universities at the end of 1800s. After founding the Association of American Universities (AAU) in 1900, the research university model based on a peer and open review system of professional society's created by AAU as the core, had made America the world leading country in research, industry, commerce and financing in 30 years [6]. Further, since it is *open*, it has been *spirally growing* as we see today. Thus the research university model is shown to be a firm national business model to spirally grow the nation run by the model without limitation, advancing knowledge through discoveries and inventions.

   Its limitation was clearly observed when the nuclear winter simulation was conducted by the U. S. A. and Soviet Union team chaired by Carl Sagan [3]. This is a clear message conveying that mere advancing knowledge may end up with destroying the entire life on the earth.

3. Meiji restoration as a fast catch up national business model

   Thirty years earlier than AAU was founded and after three hundred years of closing the country to the world, Japan has opened up the country in 1868 to catch up the world progress as fast as possible. It is generally called the Meiji Restoration. The Meiji Restoration model is basically a public education model. The emphasis is on enlightenment of people using imported knowledge combined with a re-engineering model to analyze existing advanced systems and to crack them down to reutilizable resources. As the core of its higher

education system, imperial universities were established, not as research universities defined above, but as enlightenment universities to illustrate already found knowledge outside the country. As a natural consequence, higher education in Japan has produced the bottom level number of Nobel laureates. On the other hand, it has successfully produced bureaucrats, business leaders, politicians, military power, and professors as enlighteners. Since the model is for fast catch up, after the maturity of the country reaching the level of the world, the leaders of Japan are lacking the abilities to clearly see the future and to advance knowledge. Their common everyday saying "*unclear future*" to describe the future of Japan as reported in new is a definite evidence of the nature of their business model established at the Meiji Restoration as a national business model.

4. Cyber education as a global national and international business model

The University of Aizu is modeled to enhance the research university concept eliminating inhumane aspects by explicitly adding "for Humanity" to the logo.

Let me first refer a page at the beginning of the book "Cyberworlds" [5] based on a Japan-France Workshop on Synthetic Worlds held at the University of Aizu in mid 1990s:

"Think. Do we live our life to end up sucked into black holes? Is that the destiny of the human race? Numerous people die on this earth from hunger, from disease, or even through futile hostility. If this is one side of human reality, the other side is presented here. Can we not synthesize better worlds and then make them real? Living in the digital era, a bit in a computer can be transformed into a step movement through devices such as stepping motors, linear cars, and direct control robots. Now we can be the creators of synthetic worlds. Let us cooperate toward a common goal. Cyberworlds is the manifesto and the records of the pioneers in this field. Yes, it is a book of wisdom and an open invitation to synthetic worlds, still very primitive and humble. Further, we should not let fear of failure stand in our way; to err is human.

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I drafted it to signify the meaning of the logo of the University of Aizu, stating "To Advance Knowledge for Humanity". It is intended to deliver a firm message when I coined it in 1992: The globe consists of regions, and the University of Aizu in a serene setting between Mt. Bandai and Lake Inawashiro, aims at a global and humane higher education as a research university to practice the web-based global research and education through it to ultimately practice a global and open national and international business model.

For the purpose of fostering understanding of the true meaning of research universities, I also distributed copies of book "To Advance Knowledge" by Roger L. Geiger published by Oxford University Press in 1986 [6] to professors joining the University of Aizu from fourteen different countries.
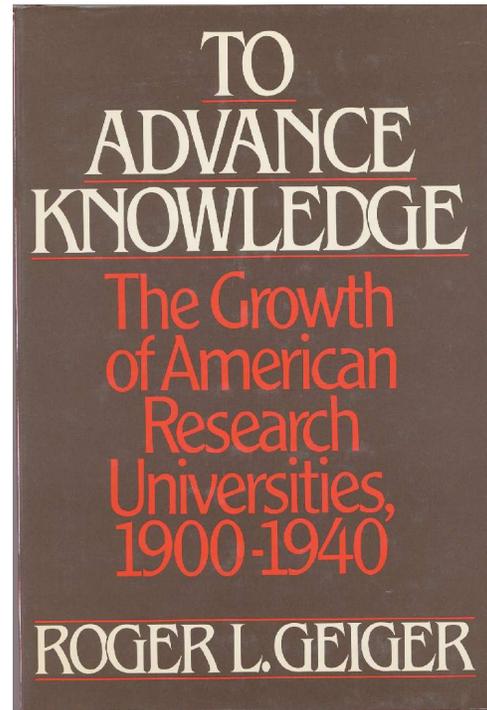
The open resources on the web have the potential for global research and education removing all boundaries. Mechanisms based on research university national business model are to be generalized to reach the level of an international business model. I have been pursuing the research university international business model of the University of Aizu in Tokyo Metropolis.

Experimental practices at a one year professional IT master course named IT Professional Course (ITPC) opened in 2000 at Hosei University has produced successful results in bringing students into global and open business startups, for example to run a matchmaking office for attorneys-at-patent based on open software. Open software used are Linux to build client-server systems and PostgreSQL to implement database servers. For the undergraduate first year students at Faculty of Computer and Information Sciences of Hosei University opened in 2000, Linux kernels has served as an excellent material for practicing application migration to different processors on Linux kernels.

Such practices are directly targeted at realizing an open and global graduate- and undergraduate- research university curricula for IT professionals as the core of a global world business model to shift the world industry from computers to *web-based information appliances.*

It is intended to extend such cyber education to turn ever expanding population in developing countries into creative, innovative and humane IT professionals through solar battery operated two way broadband satellite communication systems. It is expected to brake the current disastrous prediction of population study authorities stating that the population explosion in developing countries will case the undersupply of even primitive literacy education instructors at public schools. It is clear that a simple public school model cannot save the population on the earth, and in contrast, the web-based global and open education model, in short a *cyber education model*, turns it into valuable world growth resource to advance knowledge for humanity. Humanity education for IT professionals requires extensive research. We know very little on it. How to and where to submit original works as well as how to perform peer reviews on the web pose other key research themes. Since they are the key elements of the web-based international business, we cannot go any futher without finding answers to them. Yet, there is no shortcut. Web-base journals and web-based reviews are popular practices and at least we need to follow these lines. Currently popular varieties of web-based computer contests are easily extended to web-based peer review systems and is among the most promising approaches. It is worth noting that Russia and Eastern European countries are quit advanced on web-based publishing [7, 8].

Other closely related important issues include four themes:
1. Early education: How to make global education available to younger generations; education takes time.
2. Regionally rooted education: How to root global education in regions to construct cultural ecology to ferment creative cultural environments; the world obviously consists of regions and people there.
3. Culture education: How to educate cultural heritage and inherit cultural accumulation; the height and the depth of educational contents largely originate in the cultural heritage.
4. Æsthetic education: How to educate refined sense as the ultimate goal for quality education rather than quantity education.

These four themes are closely related to our vision into the future. It is clear without roots there is no life nor culture. They are also tied with ethics. Upright people serve as the backbone of our future.

3. Practicing experiences of global openness education at elementary and secondary schools

On August 14, 1945 when I was a seven years old elementary school boy, there was a real refreshing and vitalizing event to get exposed to a sudden openness in education after so many years of wartime nationwide information freeze and control. Almost all facts had been closed by our government for long. Realizing the discipline on facts was *science*, I have decided to dedicate my life to science and choose university professorship to pursue and prevail science. Still science for me is a true refreshment, romance and culture. At the time I reached the fifth grade in my elementary school, I organized a student open research group getting fifty students to join and my funding proposal being approved by the school. We researched on the science of the material world, and we were quite convinced on the existence of a consistent truth to govern the material world when we encountered with the theory of elementary particles.

Just before my going to the secondary school, the head of the chemistry student research group, Mr. Hata, visited my home and appointed me his successor. At the secondary school, there was a movement of new open education. The whole afternoon classes were replaced by student open research activities, having teachers as advisors. The halves of the school achievement scores were based on such open research activities. I mostly relied on university reference books to find out necessary details on practicing science. In Joseph McCarthy' advise to the U. S. President Truman and the resulting McCarran Act had forced Japan to stop open education, monitored by newly created assistant principals. Our student strike for three months was unsuccessful to move the closed education back to the open and refreshing education. We all suffered from mental choking. No more active student participation to education had created dark campuses all over Japan. It was like back to our wartime. All official school textbooks have been controlled and censored by our government and the major parts of wartime records of outside invasions were deleted. Thus, open education has been refreshing for people, but nightmares for dictators.

4. Practicing experiences of global openness education at undergraduate and graduate schools

After boring high school years having students working almost entirely in university entrance exams, I was hoping to do open research at the University of Tokyo. There was neither open research nor open education. After watching what could be done to it, I have started an open study student group TSG (Theoretical Science Group) in 1959. It is still active and we celebrated the 50th anniversary in 1999. I saw many Vaio machines brought into the celebration party and leaned that Vaio machines had been developed by ex TSG members working in Sony as information home appliances rather than as computers. It indicate the potential of open education. Also, when Department of Information Science was created in 1975, many TSG members enrolled as students. Later, after my open systems education based Berkeley UNIX source code, a numbers of them has become systems experts and worked to build the entire networked educational and administration systems based on BSD UNIX in 1993 for the University of Aizu.

At a graduate school, I had pushed open research and with other graduate students, formed a research group that could pursue model-based scientific research to study bioengineering. Computing the models of nonexistent molecules presented me the thrilling fact of a creation of cyberworlds inside computing as the cyber genesis [9] in late 1960s. Researches on open worlds inside computers, cyberworlds, was the purpose of founding Information Science Laboratory at Faculty of Science of the University of Tokyo in 1970. It has been promoted to Department of Information Science in 1975. It was a natural extension to coin and found the University of Aizu with the goal to research on further open and global cyberworlds and extend open and global education. Its facility has included one workstation for everybody on campus with 24-hour open campus year round. Open recruiting of faculty members has succeeded to gather the majority from the world to make it promising as an ever growing international research university.

5. dali 2001

It is truly a manifest of the ultimate goal of open and global education to see dali 2001 here at the University of Aizu. "dali", Digital and Academic Liberty of Information, conveys it by its creation and by people joining here. It stands as my life and hopefully everybody's life. It particularly stands for the lives of Vilbrand's family.

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