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U.S.-DPRK EDUCATIONAL EXCHANGES: ASSESSMENT AND FUTURE STRATEGY

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OVERVIEW AND ASSESSMENT

NOTES ON THE SU-KCUT RESEARCH COLLABORATION AND EXCHANGE PROGRAM[1]

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The practice of university science, like so many other human activities, is being dramatically altered by the pervasive presence of high-speed digital networks. These networks have facilitated cross-national data sharing and active collaboration among scientists widely separated by terrestrial geography. C. S. Wagner documents how science, once largely a product of national science and technology policy and funding, is becoming driven by invisible colleges of scientists from around the globe connected via modern communications networks.[2]

Of course, these networks of scientists, like the underlying digital networks that support them, are not distributed uniformly. Rather, some parts of the world are better connected than are others. A look at the world's major communications routes shows the largest bandwidth to be located primarily in (and connecting) the United States, Europe, and Asia.[3] Similar patterns emerge when one examines the world's leading universities. For example, Ortega and Aguillo mapped web links between the top 1000 world universities and concluded, "The results show that the world-class university network is constituted from national subnetworks that merge in a central core where the principal universities of each country pull their networks toward international link relationships. The United States dominates the world network; within Europe stands out the British and the German subnetworks."[4] North Korea and its universities are not significant players in any of these contemporary networks. Many of their academics are aware of this (see the discussion below) and this awareness has led to a willingness to build collaborative exchanges with other major research universities—even those in the United States. There exist significant opportunities to identify areas of mutually beneficial enduring academic cooperation between the United States and North Korea. This brief chapter provides an outline of one such cooperative venture and concludes with some suggestions for increasing academic exchange and

research collaboration between the United States and North Korea.

KCUT Collaboration

In late spring of 2001, representatives of Syracuse University (Harblin and Thorson) met in New York with Donald Gregg (then president of the Korea Society [TKS]) and Frederick Carriere (then TKS executive director and vice president) to discuss the possibility of a research collaboration in information technology between Syracuse University (SU) and a university in North Korea (Democratic People's Republic of Korea or DPRK). Neither Thorson nor Harblin was a Korea expert, though Thorson had worked on e-Government projects in South Korea and had also done related work in China and Russia. Gregg responded positively to the SU expression of interest and immediately arranged a meeting for Harblin and Thorson, together with Carriere, at the DPRK Mission to the United Nations in New York. The talks with the Mission were encouraging, and later that spring a delegation from the Mission, led by DPRK's permanent representative to the UN, together with Gregg and Carriere visited SU at the invitation of then SU Chancellor Kenneth Shaw. Jongwoo Han, a key member of the SU team, provided valuable counsel regarding protocol for the visit. At the closing dinner, Chancellor Shaw and members of the SU Board of Trustees articulated a strong desire by SU to extend its involvement on the Korean Peninsula to include the DPRK. As we later learned, this clear expression of university-level commitment was quite important to the DPRK's (as well as TKS') willingness to engage with SU.

The site visit by the DPRK to SU went well and, ultimately, the Mission suggested that Kim Chaek University of Technology (KCUT) would be an appropriate partner for SU. KCUT, located in Pyongyang and named after General Kim Chaek, who fought alongside Kim Il-sung in Manchuria, is the leading technical university in North Korea. Kim Il-sung University, KCUT, and the State Academy of Science's University of the Sciences are arguably at present the top science and IT research universities in the DPRK. Interestingly, it has been reported that Kim Jong-il visited KCUT in September of 2001 and formally advised the university to construct a digital library. As it would turn out, standards-based open source software for that library became the central shared research focus for the early meetings between KCUT and SU.

Once KCUT was identified as SU's partner institution in the DPRK, SU and KCUT each agreed to provide a group of researchers. The interdisciplinary SU team was composed of faculty members and researchers from the Maxwell School, the L.C. Smith College of Engineering and Computer Science, and the School of Information Studies as well as the Systems Assurance Institute, the English Language Institute, and the University Library. The director of KCUT's Information (Computer) Center led the KCUT team.

A delegation led by KCUT Vice Chancellor Jong Kwan Chon visited SU

in March 2002. The main focuses of these meetings were on building trust, identifying shared research priorities, and establishing some basic operating principles. For example, all quickly agreed that the objective was serious research exchanges and not mere study tours. This meant it was important to have continuity in the makeup of both the KCUT and SU research teams. It was also agreed that despite technical and political difficulties in communications between the US and DPRK[5] we would make every effort to share information between delegation visits.

In this regard the importance of the effective facilitation of communication by both the DPRK Mission and TKS cannot be overstated.

The success of this first visit led to an invitation to SU to send a science delegation to KCUT in June 2002. During these meetings in Pyongyang both sides agreed to expand resource commitments under a written plan which established the leadership of a KCUT-SU Joint Coordinating Group (JCG). In December 2002 KCUT returned to SU for a meeting of the JCG. This meeting produced an agreement to send a team of research scholars from KCUT to SU in spring of 2003 to work with SU researchers on projects including digital libraries, machine translation, and decision support.

Five KCUT researchers together with one protocol officer/translator[6] arrived in Syracuse in April 2003 for one month of intensive research collaboration with SU scholars. The director of the KCUT Information Center, who has participated in every joint KCUT-SU meeting to date, led the KCUT delegation. Research meetings were conducted in English and dealt with digital libraries, decision support, formal methods for proving program correctness, and English language training. These sessions resulted in science presentations in English of research results by KCUT and SU participants and an academic paper, written jointly by representatives of KCUT, SU, the DPRK UN Mission, and TKS, presented at the APSAC meetings at the East/West Center in June 2003.[7]

An outcome with long-range important consequences was the adoption by the KCUT digital library of the Dublin Core[8] for encoding semantic information library contents.[9] Among other things, a digital library replaces the traditional physical card catalog with a computer-driven and remotely accessible directory of library holdings. At the time that the KCUT-SU collaboration began, there was, to our knowledge, no digital library in North Korea.[10] However, KCUT was in the early stages of designing a digital library and a construction site had been identified. As a consequence of the adoption of international standards, the KCUT digital library, now completed, is in a position, with the appropriate Internet connections, to share data with other digital libraries around the world. Thus these research exchanges do affect scholarship and practice.

KCUT Vice Chancellor Jong again headed a team of five KCUT researchers and one protocol officer to SU in March 2004. All KCUT researchers had

been to SU previously, and the central research focus remained on adapting open source software to support the KCUT digital library. Researchers from both SU and KCUT gave research presentations in English at the end of the program. That the visits could be conducted in English reflected both the dedicated effort of the Koreans together with a strong training program provided by staff from SU's English Language Institute.

The research collaboration was producing tangible results. In November 2005 KCUT, SU, and TKS agreed to undertake efforts designed to enhance the program. SU Chancellor Nancy Cantor, Korea Society Chairman Donald Gregg, and KCUT Chancellor Hong So Hon signed a memorandum of understanding in Syracuse to expand the existing scientific research collaboration. The parties agreed, subject to export control and licensing considerations, (1) to implement twin integrated information technology labs (Twin Labs) at KCUT and SU to enhance and accelerate further joint research; (2) to continue the successful technical English language training programs begun in Beijing in August 2005 as the first step in the development of the Regional Scholars and Leaders Seminar program (RSLS); and (3) to exchange students and junior faculty members from each other's institution.

Following up on the MOU, SU submitted a licensing request to the U.S. Commerce Department in 2005 for permission to export a small quantity of low-level computing equipment for a Twin Lab at the KCUT digital library. (An identical lab would be located at SU.) While this request was denied, finally the denial was made on foreign policy grounds rather than national security ones. As it turned out, the request was considered at a low point in the Six-Party Talks, when the political atmosphere in Washington was extremely negative with regard to the DPRK.

KCUT's digital library opened in January 2006. Lab space was set aside within the complex to house ongoing research activities of the SU-KCUT research collaboration. During the 2008 visit of the New York Philharmonic Orchestra to Pyongyang, journalists were shown the digital library and one reported being able to access her Facebook account from the library.

Subsequent to the export license request denial by the U.S. Government (USG) and as an expression of good faith, SU sent a shipment of uncontrolled items including lab desks, chairs, tables, and file cabinets to KCUT in spring of 2007. Work on the establishment of a Twin Lab at KCUT remains a priority and SU expects again to initiate an export control request. (This process has been delayed by the political environment following the sinking of the *Cheonan*.) Also, in accordance with the 2005 agreement, a three-week technical English program was held in Beijing in 2006 and 2007. With regard to the scientist exchange program, SU and the Korea Society, with the collaboration of Korea Fulbright Foundation, received a grant from the United Board for Christian Higher Education in Asia to support a five-year program designed to bring five to six DPRK junior faculty members annually

to SU. To date no scholars have come to the United States under this program and the grant has expired.

In January 2010 KCUT Chancellor Hong and three colleagues (including the KCUT team leader) made a second trip to Syracuse. A main agenda item was to see if a way could be found to send KCUT junior faculty to SU for an extended period of research and study. Note that the DPRK is already sending researchers for extended periods to countries such as the UK, Germany, and Canada. The situation with regard to the United States is, of course, caught up in larger political issues such as the movement toward normalizing diplomatic relations between the two countries. These sessions were collegial and constructive. SU Chancellor Cantor reiterated SU's long-term commitment to its relationship with higher education in the DPRK generally and to KCUT in particular. Chancellor Hong responded by inviting Chancellor Cantor to visit KCUT. In addition, a new shared research priority was identified: green data centers.

In response to Chancellor Hong's invitation and in collaboration with the American Association of Universities[11] (AAU), SU Chancellor Cantor has agreed to lead a delegation of AAU presidents to meet with counterparts in the DPRK. Financial support has been provided by the Henry Luce and Richard Lounsbery Foundations. The DPRK has agreed to host the delegation, though precise timing will depend, to a large extent, upon the larger geopolitical environment.

Scaling Up

The scope assigned for this chapter was the bilateral exchange relationship between SU and KCUT. However, it is important to note that the hope has always been to grow this effort beyond SU and KCUT. In particular, the KCUT-SU relationship has gone through a series of phases. The first phase, reported on here, had as its primary research focus the adaptation of open source software for use as back-end support in the library and the identification of appropriate international standards for use in categorizing information held in the library. The second phase, the Regional Scholars and Leaders Seminar program, enlarged participation to include China and South Korea in addition to North Korea and the United States.[12] The RSLS sessions were held in Beijing and emphasized information sharing and developing language and presentation skills necessary for participating in international scientific meetings. The third phase involved North Korean undergraduate teams of computer scientists participating in the Association for Computing Machinery's (ACM) annual International Collegiate Programming Contest.[13] This was the first time North Korean teams had ever participated in this international science competition. The fourth phase saw the establishment of the U.S.-DPRK Scientific Engagement Consortium aimed at exploring

collaborative academic scientific activities between the two countries. This latter activity is reported on in chapter 8 of this volume.

Concluding Thoughts

1. In the present political environment, sustained engagement by a U.S. university with a DPRK counterpart requires an informed understanding and commitment on the part of the university's top administrative officers. This understanding should include awareness that there almost certainly will be ups and downs in the relationship and that bridge funding may at times be required to keep initiatives alive. SU has been fortunate to have had chancellors and board members who value the important role universities can play in opening productive relationships with countries with whom the United States has significant political differences.

2. Related to the point above, it is a difficult environment in which to obtain external funding. Often what is required is flexible discretionary funding that permits quick responses to collaborative opportunities when they arise. An example would be the workshops SU and TKS conducted in response to the DPRK desire to field teams in the ACM intercollegiate computing contest. Yet, especially in these economic times, it is often difficult for a funding agency to provide support absent a lengthy review process and a clear statement of deliverables. SU and TKS have been especially fortunate that the Henry Luce Foundation, the Richard Lounsbery Foundation, the United Board for Christian Higher Education in Asia, and several private donors have been willing to provide much needed flexible financial support.

3. These exchanges are not merely information transfers from the United States to the DPRK. Learning takes place in both directions. As Chan Mo Park (a computer scientist and past president of South Korea's elite Pohang University of Science and Technology) recently noted, "North Korea has solid expertise in computer algorithms and software development. Collaborations in these areas can be win-win for both sides."[14] Moreover, opportunities for cooperation often emerge in unplanned ways. As an example, the DPRK's involvement in the ACM Intercollegiate Programming Contest came about as a result of the SU-KCUT collaboration but participation involved DPRK universities beyond KCUT.

4. All parties should have some "skin in the game." It is important to develop a sense of what each party can do to help move collaboration forward. SU was able to locate financial support for travel and living

costs. KCUT constructed a digital library, allocated scarce human resources to the collaboration, and helped with in-country expenses when the SU team was in the DPRK.

5. More broadly, efforts should be made to encourage longer-term faculty, and ultimately student, exchanges between the DPRK and the United States. A goal here should be to realize the Korean Fulbrighters' hope for a peninsula-wide Fulbright program.[15] However, political realities render a named and USG-funded Fulbright program unlikely in the United States and the Koreas at this point. So, as an initial step private funding should be identified that could support a Fulbright-like effort in the hopes that the political atmosphere would eventually make a full Fulbright program possible.[16]

    Such a program would provide future academic leaders in the North a window on educational systems that are quite different from their own. And this would provide a softer and perhaps more palatable introduction to these differences than if they were initially to have similar exchanges with the South.

6. If such exchange programs were to move forward in the sciences they would quickly run up against the antiquated export control regime of the United States. Sustained academic exchanges with the DPRK at present require extremely onerous and expensive legal oversight to ensure that programs do not unintentionally run afoul of export control restrictions. In the most basic case this means that equipment sharing will generally require a costly export license. More subtle are the deemed export restrictions that make even talking about many technical topics problematic unless the substance of that discussion can be shown to already be in the public domain and not otherwise in violation of regulations. Moreover, these regulations are often subject to reinterpretation and thus provide a chilling context antithetical to the trust building so critical to any serious sustained academic exchange. It is tempting to argue that these controls are necessary for national security. And doubtless some are. However, it is also important to note that open collaborations (of a sort that would almost certainly run afoul of current deemed export restrictions) among working scientists characterized relationships between Soviet and U.S. academic scientists during the Cold War. Indeed, Caltech Feynman Professor Emeritus (theoretical physics) Kip Thorne, who participated in many such exchanges, has suggested that these played an important role in the peaceful ending of the Cold War.[17] Finally, much equipment falling under these controls is easily available for purchase throughout China and is present at DPRK universities and

technical institutes. The bottom line here is that we should move toward export policies that facilitate the free flow of ideas.[18] If we evince fear of the spread of ideas we should not be overly surprised when those with whom we disagree do the same.

7. Academic exchanges are but the tip of an iceberg composed of many academic procedures, legal agreements, regulations, and understandings. If these are not attended to, relationships will fail. Included here is everything from visas, housing, health insurance, food, and banking to the evaluation of transcripts, coordination (and even definition) of credits, and types of degrees. One way of beginning to build trust would be to work collaboratively on a web-based, culturally empathetic concordance of DPRK, U.S., and ROK academic terms and regulations. The ongoing construction and refinement of such a concordance would be useful to participants (a similar project was completed with the first waves of post-Soviet scholars coming to Syracuse) and, importantly, the result would be helpful to all those thinking about participating in exchanges.

8. Find areas "safe" to both the U.S. government and the DPRK within which to develop programs. Each country has its third rail issues (nuclear technology, biotechnology, human rights, and so on). There remains, however, a huge area within which collaboration is feasible. The SU experience has been that as trust builds so widen the areas of allowable cooperation.

9. Internet connectivity, as was argued above, is becoming increasingly central to a university participating in the world of education. It is a positive sign that DPRK now has its own country code top-level domain (.kp). Within DPRK there is a widely-used academic internet. DPRK students are familiar with the use of web browsers and the use of web resources. However, this internet is a "walled garden" isolated from the larger global Internet. At the same time the capacity to connect to the Internet is present. (Reporters covering the recent 65th anniversary of the DPRK ruling party found a modern media center permitting Internet access from their personal computers set up for their use at Koryo hotel.) As argued above, today's research universities simply cannot afford to be isolated from the dynamism of the Web. In this regard, the apparent official agreement by the DPRK government to permit Pyongyang University of Science and Technology students fairly open web access is a positive sign. More generally, it should be hoped that the DPRK will engage in more academic projects involving Internet-based collaboration and that USG policy will encourage such connectivity (and this relates back to

current export control policy). It may be a good omen that recently in San Francisco, Secretary of State Clinton, while discussing Syrian students' use of the Internet to criticize officials, said, "That's why the United States in the Obama Administration is such a strong advocate for the 'freedom to connect.' And earlier this year, last January I have a speech [sic] our commitment to Internet freedom, which, if you think about it, is the freedom to assemble, the freedom to freely express yourself, the right of all people to connect to the Internet and to each other, to access information, to share their views, participate in global debates."[19] Perhaps following the statement of Secretary Clinton the USG will see fit to permit export to the DPRK of equipment helpful to more widespread connectivity with the Internet.

10. We have found the DPRK scholars with whom we have worked to be serious, skilled, and sincere. They are eager for collaboration and are as curious about how our universities are organized for the multiple purposes of teaching, research, and community service as we are about theirs. That there are not more links between our universities is costly for all involved. The longer this remains the case, the more difficult it will be to remedy the situation and we hope that the suggestions made above are helpful as starting points for generating and implementing responses to this unfortunate and ultimately costly situation. If we want a better future, we must all work to create it.

Notes

[1] The work reported here was supported in part by grants from the Henry Luce and Richard Lounsbery Foundations.

[2] C.S. Wagner, *The New Invisible College: Science for Development* (Brookings Institution Press, 2008).

[3] Hyunjin Seo, *Structure of National Image in the Age of Networks: An empirical analysis of online social relations and information use* (unpublished PhD dissertation, Syracuse University, 2010).

[4] J.L. Ortega and I.F. Aguillo, "Mapping world-class universities on the web," *Information Processing & Management*, 45, 2 (March 2009), 272-279.

[5] A member of the DPRK group commented that at that time there were fewer than ten netmen in the DPRK with unfettered access to the Internet. At the same time there were said to be only two telephone lines, one primarily for fax and the other for voice between the Mission in New York and Pyongyang.

[6] From the Flood Damage Rehabilitation Committee or FDRC. FDRC was a standing committee of the DPRK Ministry of Foreign Affairs. FDRC later morphed into the Korea America Private Exchange Society (KAPES), also affliated with the Ministry of Foreign Affairs.

[7] Thae Song Sin, Hak Su Kim, Stuart J Thorson, Thomas D. Harblin, Donald P. Gregg, Frederick F. Carriere, Song Ryol Han, and Song Nam An, "Bilateral research collaboration between Kim Chaek University of Technology (DPRK) and Syracuse

University (US) in the area of integrated information technology," Asian Studies on the Pacific Coast Annual Meeting, 2003.

[8] Dublin Core Metadata Initiative. http://dublincore.org.

[9] In our original meeting with KCUT officials they were planning to use a unique encoding system (and associated proprietary software) developed in the DPRK.

[10] Kim Il-sung University is now about to open its digital library, the University of Sciences is nearing ground-breaking on its first digital library and the Yongbyon science facility now has a digital library. In meetings with representatives of the State Academy of Sciences last December, one of us was told that these libraries were, with the possible exception of the one at Yongbyon, all patterned after the KCUT facility

[11] The AAU is a very significant collaborator here. It is comprises top public and private research universities in the United States and Canada. Having presidents from some of these universities beginning to think about engagement with the DPRK is an important, even necessary, step in developing the requisite institutional trust for expanding exchanges with the North.

[12] H. Seo and S. Thorson, "Academic science engagement with North Korea," KEI Academic Paper Series on Korea, 4, 4 (2009).

[13] Stuart Thorson and Frederick F. Carriere, "Dark horse," NCNK Newsletter (March 2007).

[14] Richard Stone, "Will Korea's computer-savvy crown prince embrace reform?" *Science* 330 (October 8, 2010): 161.

[15] Korean-American Educational Commission. "World peace and the Fulbright program, the Fulbright conference and banquet for the 50th anniversary of the Fulbright program in Korea" (Seoul, Republic of Korea, 2000).

[16] For an argument as to why starting these kinds of programs earlier rather than later is cost effective, see J. Agresto, *Mugged by reality: The Liberation of Iraq and the Failure of Good Intentions* (Encounter Books, 2007).

[17] Personal communication, USC, February 2010.

[18] Mitchel B. Wallerstein, "Losing controls: How U.S. export restrictions jeopardize national security and harm competitiveness," *Foreign Affairs* (November/December 2009).

[19] Hilary Clinton, http://www.state.gov/secretary/rm/2010/10/149542.htm, October 2010.