

# **YOUNG PROFESSIONAL PAPER SERIES**

Volume I • Spring 2014

(Part I: Jin Noh)

**Integrating and Retaining World-Class Scholars:  
The Key to Innovation in Korea • Jin Noh**

**On Understanding and Responding to the Hermit Kingdom:  
The Effect of Current U.S. Foreign Policy Formulation Modeling  
and the DPRK • Andrew Kwon**

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Printed in the United States of America

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## INTRODUCTION

The Young Professionals Paper Series (YPPS) is an initiative launched under the Research Directorate of the Sejong Society of Washington, DC. The YPPS program was designed to generate original policy literature by young professionals and graduate students on issues relating to the Korean peninsula. The program provided participants with the unique opportunity to be mentored by established Korea policy experts throughout the research and writing process, and to ultimately be published in cooperation with the U.S.-Korea Institute at the Johns Hopkins School of Advanced International Studies.

Sejong Society received an outstanding number of submissions after our initial call for papers, on topics ranging from nuclear security on the Korean peninsula to the effectiveness of humanitarian aid in North Korea. After a successful research exhibition by our two finalists, Jin Noh and Andrew Kwon, in December 2013, the Sejong Society and the U.S.-Korea Institute at SAIS are pleased to announce the inaugural publication of the Young Professionals Paper Series.

## ABOUT THE AUTHOR

**Jin Noh** is currently a Master's in Public Policy student at the University of California, Berkeley where he is pursuing his studies in clean energy technologies, policies, and markets. Prior to attending Goldman, he was an analyst at SRI International where he focused on various science and technology policy issues, as well as innovation-driven economic development strategies. He also previously worked at World Vision, Korean American Sharing Movement, and InterAction. Jin received his B.A. in Public Policy Studies from Duke University.

# Integrating and Retaining World-Class Scholars: The Key to Innovation in Korea

By Jin Noh

## Why Top International Scholars Are Important for Innovation

Having exhausted the “catch-up” model of economic growth, South Korea has recognized the importance of developing home-grown innovation capacities. Lower-cost manufacturing competitors, automation technologies, and the realities of being a small country with limited natural resources are some of the factors driving Korea to transition from an emerging, manufacturing-based economy to one that is more advanced and knowledge-based. To achieve this end, developing and attracting talented human capital is an important ingredient in generating new knowledge and technologies, which in large part take place at world-class universities. Until recently, most countries relied heavily on their own universities and institutions to cultivate talented scientists, engineers, and scholars, but as human capital has increasingly become mobile through advancements in transportation and information technologies, these high-skill people are being sourced from every part of the world.

At the same time, the rise in human mobility has led to increased access to and competition for top international talent. The competition is particularly fierce among knowledge-based economies for such talented individuals since they are rare assets who are more difficult to train, develop, and replicate than, for example, a manufacturing worker. Not only are these individuals rare, but they are also impactful. Multiple studies of “star scientists,” who have among the best publication, citation, and patenting records, have documented how these rare individuals have outsized impacts in improving the financial, employment, and innovation state of firms and industries. For example, one study found that co-authorship of a firm’s scientists with a star scientist on five articles resulted in 5 more

products in development, 3.5 more products on the market, and 860 more employees.<sup>1</sup> Other studies even revealed a signaling effect for “star scientists”—i.e., employing a Nobel laureate alone increased the value of a firm by more than \$30 million and boosted IPO proceeds by \$24 million on average.<sup>2</sup> The networking and cluster effect is also at play for star scientists since they attract other stars.

Therefore, the key to creating a world-class research university is to attract the best scholars regardless of their country of origin.<sup>3</sup> The faculty scholars are the primary drivers of the quality of research and graduate programs at any university. To allow these scholars to contribute to cutting-edge research and thrive at a university, they must be successfully integrated in their university and research environment. In the case of South Korea, a concerted effort is being made to recruit international scholars, but not to integrate them in Korea. This paper will explore the issues surrounding the difficulties in integration and retention of foreign scholars in Korea and will propose solutions based on a literature review of international best practices.

## Recruitment of International Scholars

Leading countries such as the United States and United Kingdom have taken advantage of this increased human mobility by attracting top international students and scholars to raise tuition revenue, make up for their shortage of qualified scientists and engineers, and catalyze their research and innovation economy. South Korea, meanwhile, has joined the global “arms race” to capture the increasing international flows of high-skilled talent. But the country has lagged behind some of its Western counterparts in attracting and integrating these talented individuals, which presents a challenge for Korea’s knowledge economy.

South Korea struggles with a net out-migration of talented students. When looking at student migration between Korea and the United States, for example, 72,153 students from South Korea went abroad to study in the United States for the 2009–2010 academic year; by comparison, the number of U.S. students studying abroad in Korea amounted to just 2,137 students.<sup>4</sup> Overall, just 22,600 foreign

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<sup>1</sup> Zucker, Lynne G., and Michael R. Darby. 1966. “Star scientists and institutional transformation: Patterns of invention and innovation in the formation of the biotechnology industry.” *Proceedings of the National Academy of Sciences* 93 (23): 12709–16.

<sup>2</sup> Ibid.

<sup>3</sup> Cowan, Michael, Donald P. Jacobs, Lord Oxburgh, Henry Rosovsky, and Hugo Sonnenschein. 2001. “Elevating Seoul National University to a World-Class Research University.” *Findings and Recommendations from the Panel on Educational Excellence*.

<sup>4</sup> “Open Doors Fact Sheet: South Korea.” 2011. *Open Doors: Report on International Educational Exchange*. Institute of International Education.

students studied in Korea in 2006—significantly lower than the 100,000 foreign students who studied in Japan.<sup>5</sup> On the bright side, Korea has typically had relatively high return rates compared with other student-exporting countries such as China and India, and its elite Korean universities have benefited from the hiring of many foreign-trained Korean professors. Top-ranked Seoul National University is home to 52.6 percent of professors who received their Ph.D. in the United States, while nearly 80 percent of the faculty at science and engineering-focused schools such as the Korea Advanced Institute of Science and Technology (KAIST) and Pohang University of Science and Technology (POSTECH) earned their doctorates in the United States.<sup>6</sup>

Korea’s challenge appears to be one of student perception of quality and brand of the teaching and research at Asian institutions versus the quality and brand at Western institutions. According to one study of international mobility, a high world university ranking, which favors Western institutions that are generally positioned at the top end of these rankings, played a significant pull factor for graduate students in engineering. Favorable research environment and industrial employment prospects were also important pull factors in the “big science” fields, which again favor Western institutions.<sup>7</sup> Due to these perceptions, Korean universities have not ranked highly in various world rankings as shown in table 1. Rather, Korea’s top universities have historically served as intermediate-level exporting institutions that supply talented undergraduate and graduate students to high-ranking Western research universities to complete their doctorate studies and assume overseas faculty positions, resulting in a student “brain drain” and lost economic and innovation opportunities for Korean higher education institutions.

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<sup>5</sup> McNeill, David. 2008. “South Korea seeks a new role as a higher-education hub.” *Chronicle of Higher Education*, March 21: A1.

<sup>6</sup> Kim, Sunwoong. 2010. “From Brain Drain to Brain Competition: Changing Opportunities and the Career Patterns of US-Trained Korean Academics.” In *American Universities in a Global Market*, edited by Charles T. Clotfelter, 335–69. Cambridge, MA: NBER Books.

<sup>7</sup> Furukawa, Takao, Nobuyuki Shirakawa, and Kumi Okuwada. 2013. “An empirical study of graduate student mobility underpinning research universities.” *Higher Education* 66: 17–37.



**Table 1: Times Higher Education Overall Rank and International Score for Asian Universities in Top 200, 2012–13**

University	Country	Overall University Rank	International Outlook Score (out of 100)
National University of Singapore	Singapore	29	92.3
Nanyang Technological University	Singapore	86	90.5
University of Hong Kong	Hong Kong	35	81.7
Hong Kong University of Science and Technology	Hong Kong	65	78.1
City University of Hong Kong	Hong Kong	182	64.0
Chinese University of Hong Kong	Hong Kong	124	62.6
Peking University	China	46	54.1
Tsinghua University	China	52	37.2
<b>Yonsei University</b>	South Korea	183	33.4
Tohoku University	Japan	137	32.0
<b>Korea Advanced Institute of Science &amp; Technology (KAIST)</b>	South Korea	68	31.1
Tokyo Institute of Technology	Japan	128	29.6
<b>Pohang University of Science &amp; Technology (POSTECH)</b>	South Korea	50	28.8
University of Tokyo	Japan	27	27.6
<b>Seoul National University</b>	South Korea	59	27.0
Kyoto University	Japan	54	26.3
National Taiwan University	Taiwan	134	24.6
Osaka University	Japan	147	23.6

Source: *Times Higher Education* World University Rankings (WUR) Top 200 overall rankings are calculated from scores in teaching (30% of overall score), international outlook (7.5%), industry income (2.5%), research (30%), and citations (30%).

South Korea has also struggled to a certain degree in recruiting full-time foreign faculty, though the numbers and proportions have improved over the past two decades (figure 1). This pattern is also reflected in the relatively low “international outlook” scores for South Korean universities in table 1 measuring the internationalization of students and staff. Of the more than 52,000 full-time faculty members in Korean universities in 2007, just 2,212 were full-time foreign faculty (4.2 percent of the total)—a significant increase from the 379 foreign faculty (1.5 percent) in 1990.<sup>8</sup>

<sup>8</sup> “Higher Education Statistics: Full-time Foreign Faculty Rate of Full-time Faculty (University).” Ministry of Education. 2008. Accessed November 27, 2013. [http://english.mest.go.kr/web/1734/site/contents/en/en\\_0232.jsp](http://english.mest.go.kr/web/1734/site/contents/en/en_0232.jsp).

In spite of these increases, the foreign faculty data may actually be misleading because many scholars classified as “foreign faculty” are often English instructors who do not contribute significantly to research or are ethnic Koreans with foreign citizenship—making the actual number of “true” foreign faculty lower than published. By comparison, depending on the science or engineering discipline, foreign-born doctorates held from 22 percent to 33 percent of full-time faculty positions in the United States, according to pre-tenure faculty data analysis by the Harvard Graduate School of Education.<sup>9</sup> Furthermore, in a study of U.S.-born science and engineering (S&E) doctorate recipients from 1998 to 2002, South Korea was not listed among the top postdoctoral or employment destinations. Sixty-one percent of the 1,624 U.S.-born S&E doctorate recipients from 1998 to 2002 who reported in the study that they planned to work or study abroad said that they had planned on going to Canada, the UK, Germany, France, Japan, Switzerland, or Australia for postdoctoral study or employment.<sup>10</sup>

Figure 1: Foreign Faculty Employment at Korean Universities



Source: Ministry of Education, South Korea

<sup>9</sup> Harvard Graduate School of Education, “The Collaborative on Academic Careers in Higher Education (COACHE).”

<sup>10</sup> Burrelli, Joan S. 2004. *Emigration of U.S.-born S&E doctorate recipients*. National Science Foundation, Science Resources Statistics.

The relatively low number of foreign faculty in South Korean universities is somewhat surprising since Korea possesses certain advantages in attracting such talent. As a percentage of GDP, South Korea ranked as the third-best country in R&D expenditures in 2009 at 3.56 percent, ahead of some notable countries such as Japan (3.36%), the United States (2.90%), Germany (2.82%), and Singapore (2.43%).<sup>11</sup> Korea is located in the nexus of East Asia and has a mature economy with robust automotive and electronics industries, including Hyundai, Samsung, and other internationally recognized brands. The country is also home to Western-educated elites and maintains a high quality of life. Furthermore, foreign professors in Korea are paid at globally benchmarked compensation levels and earn more than their Korean counterparts. As of 2007, foreign professors received on average 80 million won (approximately \$71,000) per year, which is twice the annual salary for a Korean professor at a public university.<sup>12</sup> At the top end, POSTECH announced in 2010 an ambitious effort to invite 10 Nobel laureates to its university for a three-year stay by offering \$1 million in cumulative salary and an additional \$4 million in research and living costs.<sup>13</sup>

In addition to the aforementioned perceptions of teaching and research at Asian institutions, the difficulties in attracting foreign faculty may be tied to the perceived risks in their professional and career development by coming to South Korea. As multiple studies have shown in the U.S. case, the primary reason for international scholars' migration to the United States is its research environment: access to better research facilities, access to the international scientific community, greater exposure to productive research, and opportunities to fulfill research interests.<sup>14</sup> Despite all the cultural and language barriers in coming to the United States, the pre-tenure stresses of early-career faculty often outweigh stresses associated with being foreign-born.<sup>15</sup> Unlike going to the United States, however, foreign faculty generally view the move to South Korea as a larger risk considering they must uproot themselves from existing social and professional networks and move to a country with an unfamiliar

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<sup>11</sup> World Bank database.

<sup>12</sup> McNeill, David. 2007. "South Korea Brings in Foreign Professors by the Thousands but Is It Ready for Them?" *Chronicle of Higher Education*, February 27.

<sup>13</sup> Rhee, Byung Shik. 2011. "A world-class research university on the periphery: The Pohang University of Science and Technology, the Republic of Korea." In *The road to academic excellence: The making of world-class research universities*, edited by Philip G. Altbach and Jamil Salmi, 101–27. Washington, DC: World Bank.

<sup>14</sup> Libaers, Dirk. Forthcoming. "Foreign-born academic scientists and their interactions with industry: Implications for university technology commercialization and corporate innovation management." *Journal of Product Innovation Management*.

<sup>15</sup> Theobald, Rebecca Bayless. 2007. *Foreign-born Early-career Faculty in American Higher Education: The Case of the Discipline of Geography*. Ph.D. thesis, University of Colorado at Boulder. ProQuest (UMI 3284469).

research environment and lesser research reputation. The risks of a career setback are compounded by the short-term nature of contracts and the lack of clear contractual terms on promotion, teaching obligations, and resources in Korea.<sup>16</sup>

To reverse such trends, South Korea devised programs such as the Brain Pool program, established in 1994 to invite foreign scholars on short-term stays to conduct joint research, and Brain Korea 21 (BK21), launched in 1999 to develop graduate education and research capabilities. More recently, the Korean government established the World Class University (WCU) program in 2008 to hire “outstanding foreign scholars” over the next five years. Funded with 825 billion won (\$750 million) by the Ministry of Education, Science, and Technology (MEST) and administered by the National Research Foundation (NRF) of Korea, the WCU program is designed to boost Korean universities’ research capacities by establishing new academic departments or by hosting international scholars in Korean universities to foster collaborative research in fields “supporting economic growth.” NRF reports that more than 1,000 foreign academics applied for the program, including more than 400 from the United States, 11 Nobel laureates, and 18 members of the U.S. National Academy of Engineering.<sup>17</sup>

### Integration and Retention of International Scholars

While the recruitment of top-flight international scholars is slowly improving, the integration and retention of these scholars present an even greater challenge and represent an overlooked problem at Korean universities. Data on the scope of the integration and retention problem is largely unavailable, but an Education Ministry survey of 288 foreign academics in 2006 found that foreign professors in Korea work on short-term contracts spanning four months on average before returning to their home country.<sup>18</sup> Although this finding may stem from the way contracts with foreign scholars are structured, it is more likely that these foreign scholars have decided to leave Korea after a short stint due to the difficulties in integrating into the Korean research community and in advancing their professional careers. Considering most of these foreign scholars took great risks and paid high up-front costs in their personal and professional lives in coming to Korea, it seems more likely that these foreign

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<sup>16</sup> McNeill, David. 2013. “In South Korea, Foreign Professors Can Have a Hard Time Fitting In.” *Chronicle of Higher Education*, January 7.

<sup>17</sup> McNeill, David. 2010. “South Korea Creates Grant Program to Lure Top Foreign Scholars for Its Universities.” *Chronicle of Higher Education*, October 10: 20–27.

<sup>18</sup> McNeill (2007).

scholars would choose to stay in Korea as long as they could advance their research careers—similar to how foreign-born faculty in the United States tend to tolerate other obstacles as long as they can pursue their research interests.<sup>19</sup>

Multiple anecdotes have been published as well documenting the difficulties on professional integration in South Korea, many of which will be subsequently discussed. One of the major causes for international scholars leaving Korea after short-term stays is that the language and cultural barriers in Korea are too high to overcome. Culturally, foreign professors in Korea, especially those from Western countries, have had difficulties adjusting to the kind of top-down university administration, communication, and learning structure that is typical among East Asian countries. Mutual misperceptions between foreign and Korean researchers have been sources of conflict and have limited foreign-local collaboration. On the one hand, foreign researchers tend to underestimate the capabilities of their Korean colleagues, while on the other, Korean researchers tend to view foreign researchers as lazy for not putting in 14-hour workdays that are typical of Korean business culture and as unfairly favored due to the tax benefits and other privileges granted to foreigners.<sup>20</sup>

Students in particular have not been entirely receptive to foreign professors and their Western teaching styles. Their sentiments are often reflected in negative class evaluations that ultimately affect the contract renewal of foreign professors.<sup>21</sup> Foreign professors sometimes suffer from a perception of inferiority since they are teaching at a Korean university instead of a more highly regarded American institution. Others have cited the difference in learning styles. For example, unlike in Western classrooms, Korean students tend to rely more on rote memorization and expect the professors to feed them all the information needed to pass an exam. Cultural differences also extend to grading policy, where foreign faculty members tend to view grading as an empirical process as opposed to an evaluative one, and to the rules of what constitutes cheating and plagiarism.<sup>22</sup>

Language is also a major barrier to effective integration of foreign scholars due to the lack of high-level English proficiency among Korean students, faculty members, and university administrators. The insufficient English language abilities of students prevent them from communicating with foreign professors during lectures, Q&A sessions, and lab meetings. In addition, foreign faculty members are challenged with the lack of availability of English-language faculty meetings, administrative

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<sup>19</sup> McNeill, “South Korea Brings in Foreign Professors.”

<sup>20</sup> Altbach and Salmi, *The road to academic excellence*.

<sup>21</sup> Kennedy, Gary. 2010. “Foreign profs face obstacles in Korea.” *Korea JoongAng Daily*, August 30.

<sup>22</sup> Gress and Ilon (2009).

assistance, and resources. Faculty meetings are often held in Korean, with little to no effort to include foreign faculty in the decision making of their department; Korean university administrators contend that department decisions are best left up to native Koreans because they best understand the culture. Furthermore, administrative resources are often available only in Korean, which prevents foreign faculty from accessing critical resources and locating funding.<sup>23</sup>

In addition to the language and cultural barriers, professional development concerns are a major problem in retaining talented international scholars in Korea. Compared to the U.S. system, foreign scholars in Korea have had even more difficulty in obtaining tenure and advancing their careers. Some foreign professors have cited a sort of “feudal” system within Korean universities that favors seniority instead of performance when it comes to career advancement.<sup>24</sup> That is, tenure is automatically granted after working for a set number of years served rather than having it granted based on performance. For example, prior to 2001, only three faculty members in Seoul National University’s history failed the promotion process since most faculty members were eventually granted tenure. That stands in stark contrast to the U.S. system, where many junior faculties are not granted tenure due to the rigorous research standards.<sup>25</sup> Furthermore, foreign professors have complained about the Korean system’s overemphasis on narrowly focused metrics, such as the number of publications, as a challenge to career advancement in Korea.<sup>26</sup> Since foreign faculty are generally expected to publish in international journals, which take more time to publish especially in highly ranked English ones, the emphasis on these metrics as a measure of academic performance in Korea limits foreign faculty members’ career advancement and favors local faculty who can publish more frequently in local Korean journals. Despite the abundance of research funds made available by the government, foreign faculty have also complained about the funding situation in Korea. Until 2008, foreign scholars were barred from grant support from the National Research Foundation, which was then known as the Korea Research Foundation. Even as this restriction was lifted, foreign professors have missed out on major research funding opportunities since funding announcements are often in Korean. Even those who have secured funding have complained that they are unable to freely use their funds across different years for the project and not allowed to change allocations for overhead, equipment, students, and other spending

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<sup>23</sup> Gress and Ilon, “Successful integration.”

<sup>24</sup> Kang, Shin-who. 2009. “SNU Foreign Professors Face Cultural Shock.” *The Korea Times*, October 12.

<sup>25</sup> Cowan et al. (2001).

<sup>26</sup> Cowan et al., “Elevating Seoul National University.”

categories as they see fit to best conduct their research.<sup>27</sup> Although spending restrictions are not unique to foreign scholars in Korea, it has negatively affected their perception of the funding environment in Korea.

## Implications

Through such programs as Brain Pool, BK21, and WCU, South Korea has demonstrated its global aspirations to become a hub for higher education, research, and innovation. Korea is quickly developing a reputation as a strong research environment due to heavy government investment in R&D funds and the state-of-the-art research facilities and laboratories, as evidenced by the recent additions of the International Science and Business Belt (ISBB) and Institute for Basic Science (IBS) project.<sup>28</sup> However, while significant resources are being invested in attracting international scholars, the university and research ecosystem in Korea has not sufficiently adapted to absorb and integrate foreign scholars. In a sense, foreign scholars are brought into Korea but left to their own devices as barriers in language, culture, and professional development persist. Foreign scholars in Korea are not provided with adequate resources and information to advance their research careers and collaborate with Korean partners. As a result, not only are foreign scholars thwarted in their career development, but the integration problem also tarnishes Korea's reputation as a research destination for future international prospects and limits its collaborative research and learning opportunities with other top scholars in the world.

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<sup>27</sup> Kennedy, "Foreign profs face obstacles."

<sup>28</sup> Cowan et al., "Elevating Seoul National University."

**Table 2: Times Higher Education Research and Citations Scores for Asian Universities in Top 200, 2012–13**

University	Country	Research Score (out of 100)	Citations Score (out of 100)
Pohang University of Science & Technology (POSTECH)	South Korea	63.9	88.2
University of Tokyo	Japan	89.9	71.3
Hong Kong University of Science and Technology	Hong Kong	64.6	68.9
National University of Singapore	Singapore	87.2	67.2
Peking University	China	67.9	64.3
City University of Hong Kong	Hong Kong	41.8	64.1
University of Hong Kong	Hong Kong	85.9	62.1
Korea Advanced Institute of Science & Technology (KAIST)	South Korea	68.9	58.4
Kyoto University	Japan	74.8	57.8
Tsinghua University	China	76.4	55.2
Nanyang Technological University	Singapore	66.9	54.5
Tokyo Institute of Technology	Japan	56.1	52.0
Tohoku University	Japan	55.6	48.9
Yonsei University	South Korea	50.6	48.6
Seoul National University	South Korea	81.4	48.0
Osaka University	Japan	55.7	46.4
National Taiwan University	Taiwan	65.7	45.5
Chinese University of Hong Kong	Hong Kong	63.1	45.1

Source: *Times Higher Education World University Rankings (WUR) Top 200* overall rankings are calculated from scores in teaching (30% of overall score), international outlook (7.5%), industry income (2.5%), research (30%), and citations (30%). “Research” measures the volume, income, and reputation of a university’s research, while “citations” measures research influence.

As a result, South Korea’s innovative capacity is not developed, which is the opposite of what was originally intended in striving to attract the top international scholars. Various indicator data suggest that even as Brain Pool, BK21, WCU, and other programs have been established over the past two decades, South Korea’s performance has not improved in certain critical basic research metrics such as highly cited publications and international collaboration. On the positive side, much like other Asian countries, South Korea has experienced significant growth in the number of science and engineering articles published by Korean scholars in the Science Citation Index (SCI) and Social Sciences Citation Index (SSCI) with 10.1 percent average annual growth from 1999 to 2009, behind China at 16.8



percent but ahead of Singapore (8.2%), Taiwan (7.7%), and India (6.9%).<sup>29</sup> With about 75 percent of total public funding of university R&D going toward applied research,<sup>30</sup> it is also no surprise that South Korea ranks highly in the number of S&E patents per capita, ahead of nearly every major Western and Asian nation over the past decade.<sup>31</sup>

Yet, despite this growth, South Korea has not fared as well in research influence and collaboration. It trails most major Western nations in S&E publications on a per capita basis, as shown in figure 2. South Korea's publications are also not among the most highly cited, though a select few universities such as POSTECH have scored relatively well in terms of citations (see table 2). According to the National Science Foundation, the "Asia-8 nations," which includes South Korea, India, Singapore, Taiwan, scored relatively low in the index of highly cited articles at 0.36 for 2010, a slight increase from 0.10 in 2000. This index measures a country's share of world's top 1 percent cited articles divided by its share of world articles for the cited year window. By comparison, the United States, European Union, and Japan had index scores of 1.76, 0.94, and 0.61 respectively.<sup>32</sup> Furthermore, South Korea has rated poorly in internationally co-authored S&E articles. In 2010, only 4.4 percent of its S&E articles from SCI and SSCI journals were co-authored with an individual from an institution outside of South Korea, a slight increase from 2.3 percent in 2000. Although it outperforms India (3.3%), Taiwan (2.2%), and Singapore (1.8%) in this regard, it trails most Western countries, among them the United States (42.9%), Germany (18.8%), United Kingdom (18.7%), France (13.8%), and Canada (10.1%). South Korea also does not have as many internationally co-authored S&E articles as China (13.0%) and Japan (8.2%).<sup>33</sup>

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<sup>29</sup> National Science Foundation. "Table 5–17 S&E articles in all fields, by country/economy: 1999 and 2009." *Science and Engineering Indicators 2012, Chapter 5: Academic Research and Development*: 1–54.

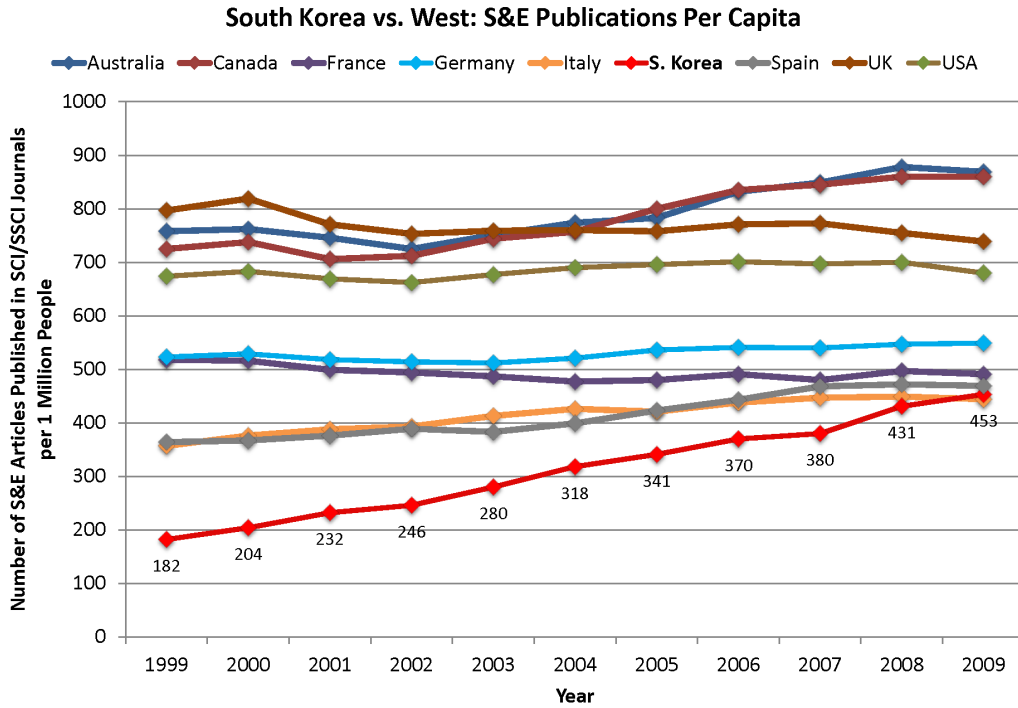
<sup>30</sup> Rhee (2011).

<sup>31</sup> Rhee, "A world-class research university."

<sup>32</sup> National Science Foundation. "Table 5–29 Index of highly cited articles, by selected S&E field and region/country: 2000 and 2010." *Science and Engineering Indicators 2012, Chapter 5: Academic Research and Development*: 1–54.

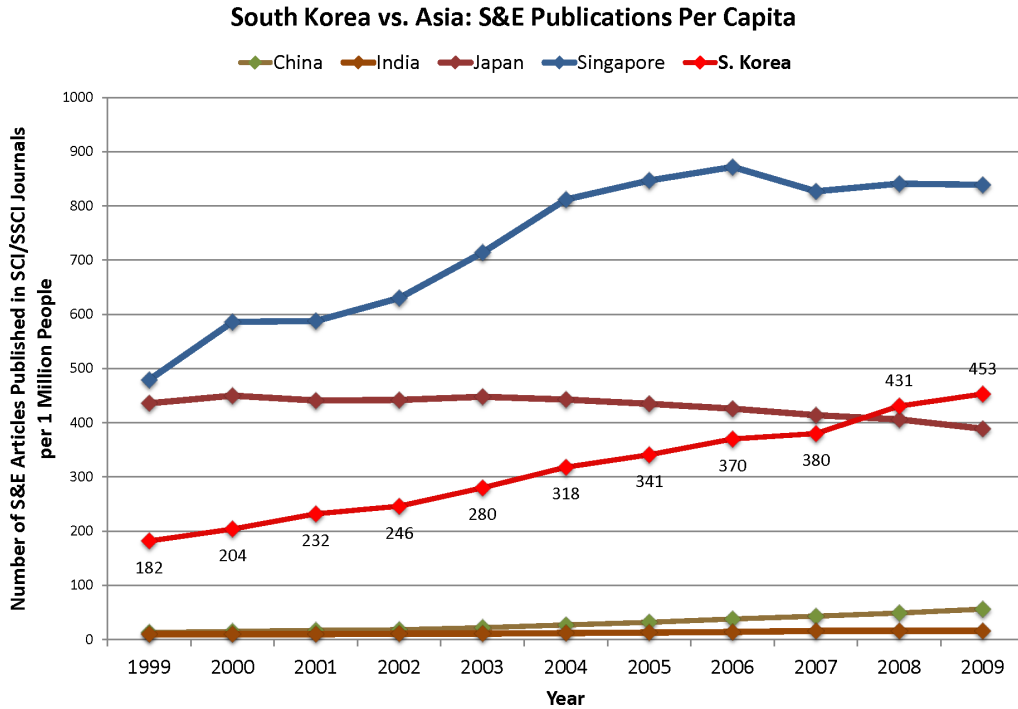
<sup>33</sup> National Science Foundation. "Table 5–18 Share of internationally coauthored S&E articles worldwide, by region/country: 2000 and 2010." *Science and Engineering Indicators 2012, Chapter 5: Academic Research and Development*: 1–54.

Figure 2: South Korea vs. West: S&E Publications Per Capita



Source: NSF, NCSES, *Science & Engineering Indicators 2012*

Figure 3: South Korea vs. Asia: S&E Publications Per Capita



Source: NSF, NCSES, *Science & Engineering Indicators 2012*

Granted, there are limitations to relying solely on these indicators. In addition to the limitations of the indicators themselves, the overreliance on indicator data and lack of expert external reviews have been frequently cited as criticisms of Korea's performance evaluation system. One could also argue that Korea's faculty globalization programs require a longer period of time to see the results bear out and that other factors outside of globalization are important to improving metric outputs. Furthermore, data on how foreign scholars in Korea perform relative to their Korean counterparts, and whether foreign scholars improve the performance of Korean universities would be more pertinent than these country-level indicators, but unfortunately, such data are not currently publicly available from the ministry.

Despite these limitations, the aforementioned indicators provide a decent snapshot into the state of basic science and engineering research in Korea and worldwide and demonstrate how Korea has not significantly improved its research influence and international collaboration since the start of its faculty globalization programs. Foreign scholars have been recruited to Korea for this purpose, yet the slow growth and relatively low scores for Korea in research influence and international collaboration suggests that these programs may not be effectively recruiting or integrating top foreign scholars into Korean universities.

## Policy Recommendations

In an effort to resolve or mitigate these issues, the following policies are recommended:

### *Recommendation 1: Refine faculty globalization objectives*

Currently, Korea's faculty globalization programs are being broadly interpreted such that universities are recruiting foreign scholars primarily to boost the number of foreign faculty on paper and thereby boost the country's ranking instead of actually internationalizing faculty departments and research. However, these nominal faculty globalization achievements will most likely wane as foreign scholars increasingly realize how many universities are more interested in attracting foreign scholars with little or no attention given to how they will be integrated into the Korean research environment.

Therefore, through faculty globalization programs such as BK21 and WCU, the national government needs to refine its globalization objectives to include how well foreign scholars are being integrated and whether foreign scholars are staying at Korean universities. Before granting funds, NRF could evaluate whether the applying university has plans in place to orient and integrate foreign scholars in its campus environment. On the back end, after funds are granted, NRF could evaluate a university's

performance in effectively integrating foreign scholars to determine future funding prospects for the university. Regular evaluations could be conducted through surveys that collect data on the publication, tenure, and collaboration record of foreign scholars and ask them about their experience in Korea.

*Recommendation 2: Transition to an all-English standard in classrooms and campuses*

While cultural barriers point to a deeper societal issue that cannot be addressed easily from top-down policies and interventions, the language barrier is an issue that can be relatively easy to address by making English use ubiquitous in all facets of the university and research community. Many of Korea's top universities—including KAIST, Seoul National University, Sogang University, Yonsei University, and Korea University—have already begun transitioning to all-English undergraduate classes. Others, such as Gyeongsang National University, have established English-only campus zones where everything (e.g., classrooms, dormitories, and coffee shops) and everybody (e.g., waiters, guards, and janitorial staff) in the zone is immersed with English and English speakers. Several of the top Korean universities have also made strides in increasing the availability of English-language meetings and resources. POSTECH is pushing for the entire university's administration to become bilingual, for example. Bilingual graduate students, Korean faculty, or more experienced foreign faculty members are also being assigned as liaisons for foreign faculty in locating and securing research funding and navigating university administration.

However, these changes have been met with opposition from older Korean faculty at several universities who feel alienated by these policies. Many Korean professors have difficulties in lecturing in English, while Korean students have felt their learning was limited by the use of English in the classroom, for example. Many Korean students in particular have voiced their displeasure in being taught in a foreign language when they had chosen to study in Korea instead of abroad. Notably, Euh Yoon-Dae was denied reelection to the four-year position as president of Korea University due to his policies to hire only Korean faculty capable of teaching in English and his goals to increase to 60 percent the number of courses taught in English.

Despite challenges from Korean students and faculty, the South Korean government must take the lead in pushing for English-use policies at universities, labs, funding agencies, and all other parts of the academic and research community. English is the language of science, and it is therefore important in conducting internationally visible research and attracting and retaining international scholars. Almost every major highly cited scientific journal is published in English, which is also the most common

language for communicating with international collaborators. Other countries, such as Italy<sup>34</sup> and France,<sup>35</sup> where English is not the native language, are pushing for similar policies for similar reasons despite resistance from native-born scholars. Likewise, South Korea must push through this resistance. Because the Brain Pool, BK21, and WCU programs are run by NRF, it can establish and enforce English-use policies for any university that accepts funds from these programs. NRF should also make funding announcements and peer review available in English. The current piecemeal and bottom-up approach does not seem to be working effectively, and this recommendation would simply be a natural extension of the Brain Pool, BK21, and WCU programs that better ensure their success.

*Recommendation 3: Transition to a performance-based incentives system where tenure and promotions can be achieved based on merit, not seniority*

To attract foreign faculty and retain them in Korea, Korean universities need to adopt a U.S.-type tenure-track model that allows exceptional scholars to achieve tenure based on merit rather than length of service. Currently, professors in Korea are more akin to civil servants than to academics or scholars. The reason for adopting such a model is that foreign scholars are coming to Korea first and foremost to advance their careers. Having their performance unrewarded financially or with a career promotion has the potential to cause current foreign scholars in Korea to leave and to deter future scholars from coming to Korea. In addition, adopting a U.S.-type tenure-track model would improve the outputs and outcomes of Korean universities. Studies have shown that Korean professors have demonstrated minimal initiative to increase and improve their performance since they know that they will be granted tenure and other promotions based on seniority.<sup>36</sup> While the U.S. model is hardly without flaws, it would establish more performance-based incentives that are currently lacking in Korea.

Changes appear to be under way at a number of top universities in Korea. University presidents have recently been attempting to establish U.S.-type merit-based systems for conferring tenure and scholarships, for example. The time it takes to reach full tenure has also been shortened at some Korean universities, such as KAIST and POSTECH, to mirror the U.S. model. At POSTECH, all assistant professors are required to apply for and pass their tenure review within seven years of their initial appointment, and those who fail are granted a one-year grace period. POSTECH also introduced a performance-based compensation system in 2000 that determined faculty salary based on teaching,

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<sup>34</sup> Williams, Megan. 2013. "Elite Italian University Struggles With Shift to English." *Chronicle of Higher Education*, June 3.

<sup>35</sup> Beard, Stephen. 2013. "Proposal to allow English in French universities irks some." *Marketplace*, May 22.

<sup>36</sup> Cowan et al. (2001).

research, and public service accomplishments over the preceding three years, a practice that is being more widely adopted among private universities in Korea.<sup>37</sup> Furthermore, faculty mobility among universities in Korea has increased, which is one way for academic scholars to advance professionally, demonstrating a break from a system that values seniority and loyalty over individual performance record. A survey in the fall of 2005 of 182 universities in Korea revealed that 18.2 percent of new hires were transfers from another university, representing a major increase from previous years.<sup>38</sup>

However, in a country where a faculty position traditionally ensures lifelong employment, these universities attempting such reform have met strong resistance from Korean professors, sometimes resulting in the ouster of university leadership. In the case of KAIST, Robert Laughlin left his position as president in 2006 due to his policies being “too radical,” after he had implemented a peer review process that shed approximately 25 percent of the university’s 550 faculty members and hired 135 others. Ultimately, his policies lowered the average age of the faculty and increased the number of foreigners working at KAIST.<sup>39</sup> Most recently, the current university president, Suh Nam-pyo, a former MIT professor, met resistance as he implemented strict tenure-track examinations, though he was eventually reappointed in 2010 for another four-year term.<sup>40</sup>

Unfortunately, in this case, it is difficult for the national government to directly encourage and implement a system of performance-based incentives. Traditionally, the Korean government has assumed strong control over higher education through direct intervention in or regulation of institutional management, but now it mostly exerts influence indirectly through competitive grants and funds. Although the government has greater influence with its public national universities such as Seoul National University, it has recently been increasing subsidies for university operating budgets for private universities as well by which the government can push its higher education agendas. However, most of this influence is limited to setting standards, such as subjecting universities to institutional performance indicators relating to student employment, financial aid, and educational expenditure per student, not with how a university is managed.

Instead, most of the leadership for this policy recommendation will have to come from individual universities, which will need to engage Korean professors and help them understand that these changes are needed for international competitiveness. Considering POSTECH was established in

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<sup>37</sup> Cowan et al., “Elevating Seoul National University.”

<sup>38</sup> Rhee, “A world-class research university.”

<sup>39</sup> Kim, “From Brain Drain to Brain Competition.”

<sup>40</sup> Na, Jeong-ju. 2012. “KAIST—graveyard for foreign presidents.” *The Korea Times*, July 16.

1986 and modeled after the California Institute of Technology, it may have been easier to make these changes since it has a limited institutional history of how tenure and promotions are granted. Regardless, changes from a seniority system to a performance-based system are needed to attract and retain foreign scholars who would otherwise leave for better career prospects.

*Recommendation 4: Pursue a targeted strategy for recruiting foreign scholars who are likely to stay in Korea for the long term*

To improve the retention of foreign scholars in Korea, government policy makers and university administrators should pursue a targeted approach in recruiting foreign scholars who are more likely to stay in Korea for the long term. Currently, Korea has had relative success in recruiting older scholars who are retired or near retirement and young post-docs who are unable to find permanent or tenure-track positions in their home countries. While the older scholars generate more headlines since they have a long list of accomplishments and awards, the young post-docs may present a greater long-term value to Korea's research community. As Western countries struggle with an overproduction of doctorate graduates relative to the supply of permanent and tenure-track positions available, many are turning to international opportunities. By targeting this young demographic, Korea has a chance to domestically cultivate a new generation of promising international scholars who eventually have stronger ties to Korea as they develop social networks and start families in Korea.

Furthermore, the recruitment of foreign scholars should be targeted in a few strategic fields of science where Korea has a unique competitive advantage in terms of scholarship and infrastructure. Given the small population of the country, Korea has struggled to develop a critical mass of expertise in any given field, which may be a concern for foreign scholars in coming to Korea. Although transportation and communication technologies have allowed scholars to collaborate with other experts in their field across borders, the physical location of field expertise still plays a significant factor in research collaboration as demonstrated by numerous cluster effect studies. Location also affects the peer review process because the lack of critical mass in a certain field may cause funding proposals to be evaluated and awarded by non-field experts. As a result, a comprehensive study of Korea's research landscape and advantages needs to be conducted to understand the near-critical-mass fields for which foreign scholars should be recruited. POSTECH followed a similar hiring strategy for a few high-impact

research areas since it could not hire professors in every academic field.<sup>41</sup> With a larger expertise base in a given field, international scholars within that field may be more willing to come to and stay in Korea.

In addition to the fields of science where Korea has a unique advantage and a critical mass, Korea could target research areas where other countries are not providing sufficient research funds. For example, professor emeritus Perry McCarty of Stanford University says he accepted an invitation to the WCU program because of his research interests in advanced wastewater treatment, an area that has lacked strategic funding support in the United States.<sup>42</sup> Therefore, Korea could conduct a comprehensive study of the international research landscape and determine funding gaps for areas of research that are critical to global science for which Korea can fulfill. International scholars in these underserved fields would then be enticed to come to and stay in Korea for research.

## Conclusion

Recruiting and retaining top international scholars is important for South Korea's goal to become a world-leading innovation economy. Korea has recognized the importance of globalizing its university faculty as evidenced by the government's initiating the Brain Pool, BK21, and WCU programs. Thus far, Korea has directed its focus on recruiting foreign scholars to Korea through these programs but has neglected to put forth the same effort in integrating foreign scholars into Korea's academic and research environment. Foreign scholars have cited language, culture, and professional development barriers as reasons for dissatisfaction and for leaving Korea after a short-term stay. The poor effort to integrate foreign scholars has correlated with Korea's minimal improvements in highly cited publications and international collaboration, which faculty globalization was supposed to increase. Therefore, to achieve real globalization and improve Korea's innovative capacity, a greater focus on the integration of foreign scholars is needed.

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<sup>41</sup> Rhee (2011).

<sup>42</sup> Rhee, "A world-class research university."





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