Study Series 21-03

North Korea's College and University and Higher Education System in an 'Era of Knowledge Economy'

Jeong-ah Cho
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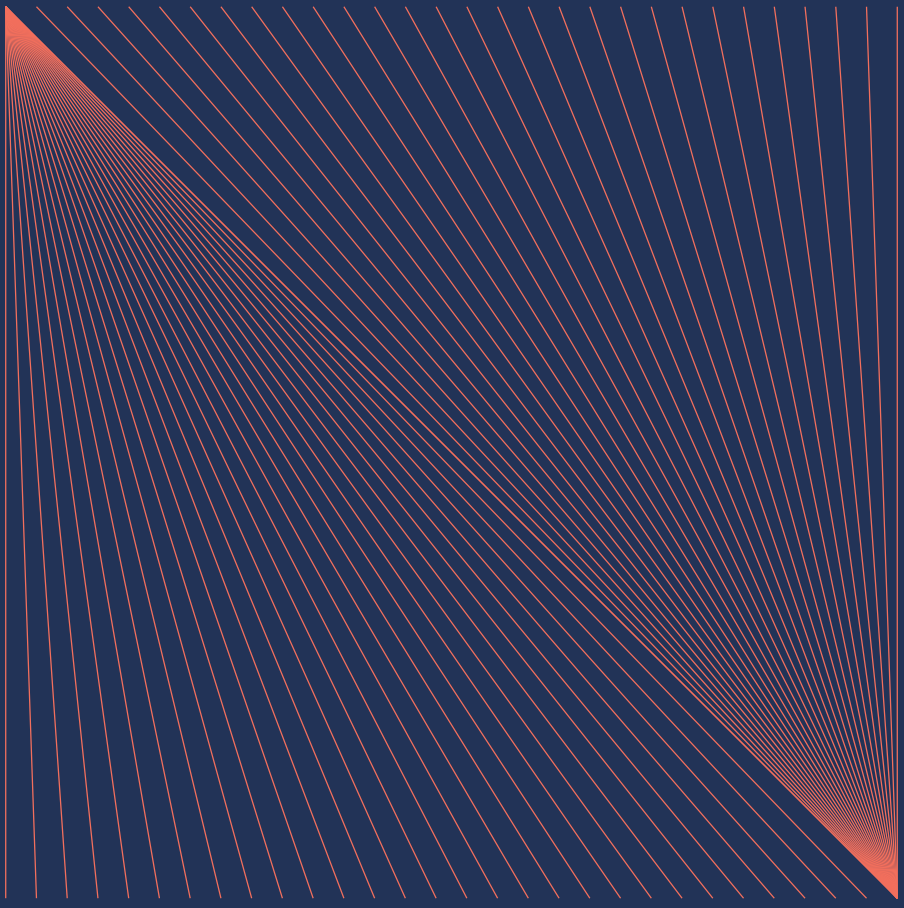

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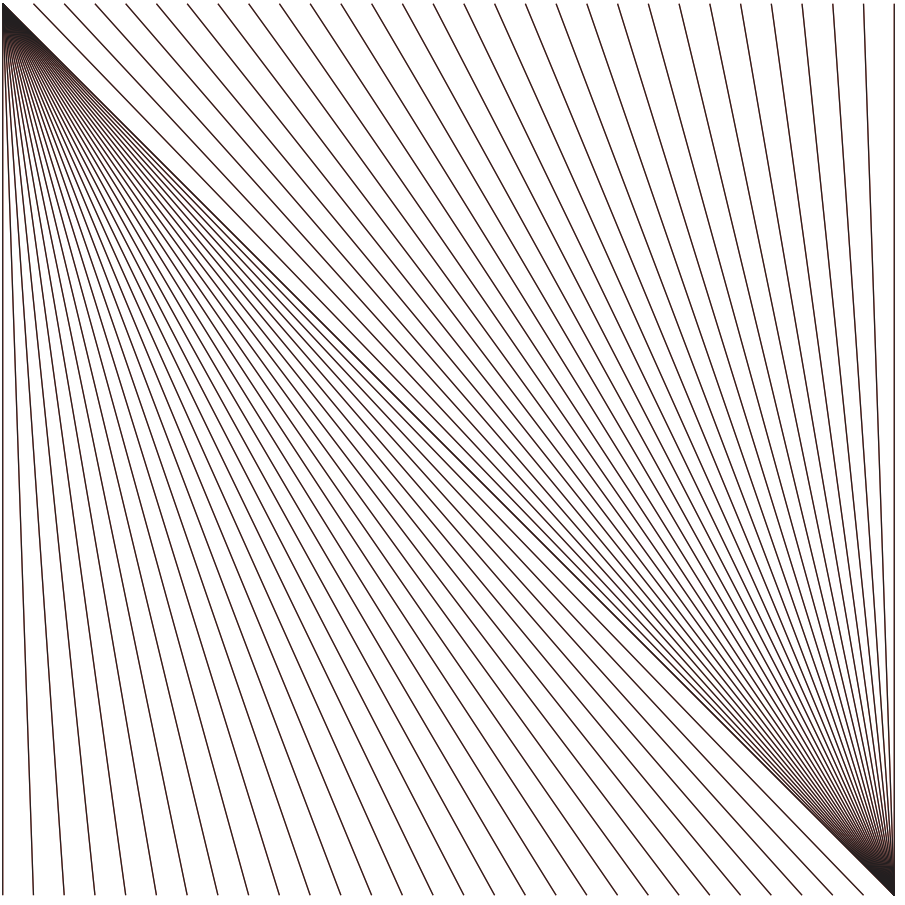

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CONTENTS

1

Introduction

Education is an area in which policy changes have been most profound under the Kim Jong-un era. The North Korean government has defined the current period as the era of the 'information industry' and the 'knowledge economy,' and views the development of science and technology that will promote these period-leading changes as the future determinants of its national power. It has been proclaimed in North Korea that "while scientific technology is the engine leading national economic development, the mother of scientific technology is education"[1] to emphasize the importance of nurturing individuals well-versed in science and technology. The vision of 'Making All People Well-versed in Science and Technology' of the Kim Jong-un era demonstrates North Korea's policy designed to achieve their national goals of establishing a 'powerful socialist country' and a 'prosperous economy' through the cultivation of human resources in science and technology.

Based on this belief, North Korea has tried to implement various changes to its education system, curriculum, and teaching methods starting with reforms to its elementary and secondary education system in 2012. The North is also attempting structural and policy changes to its higher education system with an eye to international trends in education. While North Korea's education policies had focused on revising the elementary and secondary education system to make it more substantive during the early years of the Kim Jong-un regime, attention has since been towards structurally revising the higher education system to achieve the goal of 'Making All People Well-versed in Science and Technology' since the mid-2010s. Considering the case of China where structural reform to its higher education system was carried out in conjunction

1) *Rodong Sinmun*, September 4, 2019.

with the policy of reform and openness, recent changes to North Korea's higher education system can be conceived as an important factor that indicates the future direction of North Korean society. From this perspective, this study collects basic information such as the current state of North Korean colleges and their curricula, and uses this data to analyze the characteristics and direction of recent changes to North Korea's higher education system.

This study examined official documents such as major statements by Kim Jong-un and materials from the Workers' Party of Korea (WPK) meetings, as well as other publications from North Korean news outlets and periodicals on education to understand North Korean policies and discourse on education. In particular, Kim Jong-un's speeches at the National Conference of Teachers held in 2014 and 2019 are the most crucial materials for understanding the direction of North Korea's higher education policies and some of the main issues in education. In addition, materials from the 7th WPK Congress held in 2016 and the 5th Plenary Meeting of the 7th Central Committee of the WPK held in 2019, as well as new-year statements shed light on policy changes and key issues at each stage of the process. Among North Korean publication, this study concentrated on *Rodong Sinmun and Kyoyuk Sinmun*, while other periodicals related to education were referenced to identify whether and how the direction of national policies was actually being implemented in the field. Noteworthy is how recently published periodicals on education have actively introduced and studied the education policies, systems, curricula, and teaching methods of countries around the world that, in turn, have shown the direction in which the North Korean government is trying to implement an education reform.

To create a list of North Korean colleges and understand their characteristics, this study collected the names of colleges that have appeared in North Korean news outlets since 2012. North Korea does not publicly reveal the current status of its college system through official documents. The number of colleges is only occasionally mentioned as "approximately 300" or "approximately 500" in *Rodong Sinmun* reports. There are no statistics regarding education that can be accessed from the outside. Basic statistics that are regularly reported to international organizations such as UNESCO only include a few pieces of primary data such as the number of schools and students at elementary and middle schools and the number of teachers per student. The number of categorized higher education institutions, the number of students attending, and the list of schools remain unknown. Under these circumstances, the process of creating a list of North Korean colleges is the most basic level of task but also the most difficult one. The primary sources examined in this study are North Korean newspapers such as *Rodong Sinmun* and *Kyoyuk Sinmun*, and periodicals such as *Kodŭng Kyoyuk, Kyowon Sonjon Suchop*, *Inmin Kyoyuk*, and *Yoksa Kwahak*. Periodicals including *Kisul Hyoksin* and *Palmyong Gongbo* were reviewed to search the names of colleges in the fields of science, technology, engineering, and medicine (STEM). The study explored the names of colleges listed in both North Korean phone books published in the early 2000s as well as classified documents obtained in 2006 that included the curriculum of a few colleges, and names listed in the 'North Korean Human Geography (http://www.cybernk.net) site' compiled by the Institute for Peace Affairs (IPA). College names noted in the 'North Korea Directory' published by South Korea's Ministry of Unification as

well as the 'North Korea Directory (朝鮮民主主義人民共和國 組織別人名簿)' published in Japan were also compared to the lists. Moreover, the study collected primary source information by accessing databases in North Korea and websites of certain North Korean colleges. The list of colleges was compiled using these sources and then categorized by their location, type, and major. The study initially categorized the type and major of colleges using information obtained from newspapers and periodicals, and later finalized the list through a series of consultations with South Korean researchers that study North Korea's education and science and technology with an aid of experts that used to work as college professors in North Korea.

Due to the inaccessibility of the most up-to-date documents, an analysis of the curriculum at leading North Korean colleges was conducted primarily based on information from 2006 which was then compared to the recent curriculum compiled using the testimony of North Korean defectors. Graduate school programs were analyzed using newly obtained documents regarding the curriculum in North Korea such as "guidelines for scientific research projects" and "syllabi," even though information on the entire curriculum was unavailable. The study also collected and referenced books on education published in North Korea to understand recent changes in the management of the curriculum and teaching methods.

Lastly, the study also conducted in-depth interviews of eight North Korean defectors that either worked at North Korean colleges or government agencies on education since the early 2000s or graduated from college over the past 1~3 years to cross-reference the changes at North Korean colleges noted in materials and

periodicals published in North Korea and to more accurately evaluate the state of college education.

2

Discourse and Policy on Higher Education during the Kim Jong-un Era

The second chapter examined the characteristics and trends in changes to North Korea's higher education policy during the Kim Jong-un era by examining speeches by Kim Jong-un, documents from major national meetings, articles published in periodicals on education, and editorials in *Rodong Sinmun*. This chapter particularly looked at how the discourse of 'Making All People Well-versed in Science and Technology' has progressed since it first emerged out of awareness of the 'knowledge economy era' and 'information industry era,' and how major higher education policies have changed as a result.

The North Korean concept of the knowledge economy is similar to the notions of the 'knowledge-based society of the 21st century' and the 'information society' widely accepted in western cultures. North Korea defines the 'knowledge economy' as "an era in which the discovery of new knowledge (information) and the diffusion of technology (knowledge) are powerful drivers of socio-economic development, and an era in which the knowledge industry leads the growth of both the society and the economy."[2] It is perceived that knowledge and information have become pivotal resources of production, and that knowledge labor is a major component of production in the knowledge economy era. North Korea also emphasizes the role of advanced science and technology based on the assertion that economic development will be driven by advanced science and technology development and that the knowledge industry will become a core industry that stimulates economic development.[3] As Kim Jong-il has actively promoted the

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2) Keumran Jang and Kwangchul Pak, *Global Trends in the Development of Education and the Informationalization of Education* (Pyongyang, North Korea: Kim Hyong Jik University of Education Press, 2012), p. 7 (in Korean).

3) Youngsuk Son, *The Knowledge Economy Era and Certain Issues in Economic Theory* (Pyongyang, North Korea: The Scientific Encyclopedia Press, 2014), pp. 122~124 (in Korean).

development of information technology, the notion of knowledge economy has been applied for governing for the first time.[4] It began with Computerized Numerical Control (CNC) technology that has vastly improved under Kim Jong-il. In a statement addressing the 'responsible workers' of the WPK Central Committee on January 1, 2010, Kim Jong-il stated that "by developing advanced technologies such as CNC technology, humanity has entered the era of knowledge economy in which progress is driven by human knowledge," emphasizing the importance of a 'high-tech breakthrough' for the building of a powerful nation.[5]

Though the North Korean concept of the knowledge economy is similar to that of western cultures, North Korea also claims that it is different as it reflects the unique nature of the socialist regime. Based on its traditional emphasis on 'self-reliance (*Juche*),' North Korea stresses a self-reliant approach to the pursuit of knowledge economy. It also mentions the superiority of socialism as a method of realizing a knowledge economy. North Korea uses the phrase "industrial revolution of the new century in our style" to highlight the need to promote a science and technology revolution that meets the needs of the times while conforms with the characteristics of the North Korean society. Kim Jong-un has positioned an industrial revolution in accordance with the times as a part of the national development strategy, stating that "adding the industrial revolution of the new century to single-minded solidarity and the unbeatable military force will result in a strong and prosperous socialist country."[6]

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4) "The Dear Leader and CNC," *Rodong Sinmun*, March 3, 2011.

5) Jong-il Kim, "Achieving Advanced Breakthrough in Every Area based on the Achievements and Experiences of Developing Our-style CNC Technology," in *Kim Jong-il Sonjip* (24) [Select Statements by Kim Jong-il], Supplementary Edition (Pyongyang, North Korea: The Workers' Party of Korea Press, 2014), p. 453 (in Korean).

Given that the knowledge economy is based on the growth of advanced scientific and technological knowledge, building a strong and prosperous nation through a science and technology revolution has been proposed as a major national policy objective. As a result, efforts have been made to not only understand the characteristics of human resources and the education to train such talents necessary in the knowledge economy era, but also to subsequently reflect this in their education policies. The goal of 'Making All People Well-versed in Science and Technology' was announced at the 9th National Meeting of Science and Technology Workers held in November 2011 as well as the 13th National Meeting of Educators held in September 2014. The fact that "realizing the objective of 'Making All People Well-versed in Science and Technology' is a vital aspect of future socialist education" was demonstrated by the revision of North Korea's Education Law and the Socialist Constitution. Though the goal of 'Making All People Well-versed in Science and Technology' is widely pursued in all phases of education including compulsory education, and higher education, higher education is considered the most pivotal. Based on such perceptions, the North Korean government has expanded higher distance education to adult workers that did not receive higher education during their school years, while promoting reforms of higher education system and curriculum.

Reforms of higher education under Kim Jong-un have followed 'global trends' or in other words, the direction of meeting global standards and responding to the transition towards the knowledge economy era and information era. To facilitate reforms, studies of education reform trends in China as well as other countries are

6) *Rodong Sinmun*, April 16, 2012.

being conducted in North Korea. If assessing and following 'global trends' is one major pillar of higher education reform, the other is seeking an 'our style' higher education reform that suits the North Korean reality. The main policies regarding higher education reform are as follows.

First, North Korean authorities have established a national education development strategy to reflect the need to train and educate highly skilled personnel that will contribute to the development of independent technologies and lead the knowledge economy, and ensured that regions and colleges implement policies corresponding to that strategy. North Korea's education authorities have crafted the national education development strategy and distributed it both at the regional and college levels. Recently, colleges have created their own education development strategies and revised their curriculum to reflect the direction that they have set for themsevles. Establishing these education development strategies is based on the acknowledgment that it can transform education to be more purpose-driven, and to improve the education system and curriculum to reflect global trends and meet the realities of the country at the same time.

Second, the North Korean authorities have reformed major central universities such as Kim Il-sung University, Kim Chaek University of Technology, and the University of Science into research-oriented universities and attempted to make them 'top-tier' universities that are internationally competitive. To do so, the education academic community in North Korea has studied international trends at research-oriented universities and tried to reflect them into policy. Specific reform measures include increasing the number of technology-related departments, integrating and

restructuring colleges, expanding graduate programs and increasing education for gifted students, installing advanced technology-centered research institutions, and facilitating international exchanges related to education such as submitting academic articles to international journals.

Third, graduate schools are being expanded and the research capacity of colleges is being enhanced. In the past, there were relatively less active research and teaching at graduate schools, but policies including an integrated B.A.-M.A. degree program, enhancing research capacity of graduate schools, strengthening graduate school education for gifted students, modifying the curriculum, and raising the capacity of college professors by increasing the number of doctorates have been pursued to improve education at graduate schools.

Fourth, policies have been implemented to increase the number of universities by integrating colleges both based on their subjects and region since the mid-2010s. The role of specialized universities was strengthened as it added the functions of 'academic-based, information-based, evidence-based, and distance education-based' institutions with the promotion of 'centralizing education on specific subjects.' Departments at these specialized universities have been structured in a way that is comprehensive and covers a wide range of subjects, while information-related departments and distance-learning departments have been created to expand their coverage. However, most colleges that have been upgraded to universities were relegated back to colleges with certain majors in late-2019 (although renamed as colleges, they still contain the function of university) and the schools that were integrated in the process were dissolved. This appears to have been caused by

financial difficulties and limitations on the teaching environment, disputes between members of the college community as a result of integration and issues of treatment, and the discrepancy between the form of a university and the realities facing North Korean colleges.

Fifth, the North Korean authorities have distinguished the types of colleges based on a categorization of human talent development system between academics and practitioners under Kim Jong-un, and this has affected the status and role of junior colleges. Reform of North Korea's junior colleges focused on upgrading it to near college levels that can prepare graduates for intermediate technological skills. In 2016, '*Jeonmun Hakkyo* (specialized school),' which were the equivalent of a junior college, was abolished with some being upgraded and transformed into specialized vocational colleges or factory colleges after evaluations, while others were consolidated with colleges with certain majors or factory colleges at the province-level.

Sixth, the North Korean authorities have attempted to integrate and increase the number of departments to adapt to the expansion of universities and integration of colleges, to teach and train graduates required in the knowledge economy era, and develop research colleges. Focused on universities, reforms have been undertaken since the 2000s to comprehensively restructure the department system. While some were combined with others, the number of departments actually has increased as a result of the policy effort to install majors related to advanced technology.

Seventh, the North Korean authorities have improved the curriculum and teaching methods by following global trends in these fields. The North has bolstered subjects related to advanced technology such as information technology in its curriculum, improved teaching of basic courses, and restructured the college system by shifting from a year-based system to a credit-based system. However, these reforms have been limited due to a subject-based curriculum as well as continued emphasis on political ideology education. On the other hand, teaching methods based on IT and networks have vastly improved. Specific measures that have enhanced teaching include the utilization of computers and computer networks, the use of multimedia materials, the establishment and use of academic databases, expansions of computer-based testing, and the informatization of education administration.

Eighth, the rising distance education and the consequent expansion of higher education are two of the main features of recent reforms in higher education in North Korea. In particular, distance education is viewed as the most pivotal way in which the national vision of 'Making All People Well-versed in Science and Technology' will be achieved under the Kim Jong-un regime. While the expansion of distance education is a global phenomenon, what is noteworthy is how North Korea is treating it as a major component of its regular higher education system. Distance testing using computers is also being expanded. Both distance education and distance testing will likely be further utilized in the midst of the COVID-19 pandemic.

3

North Korea's Higher Education System and the Current State of Colleges

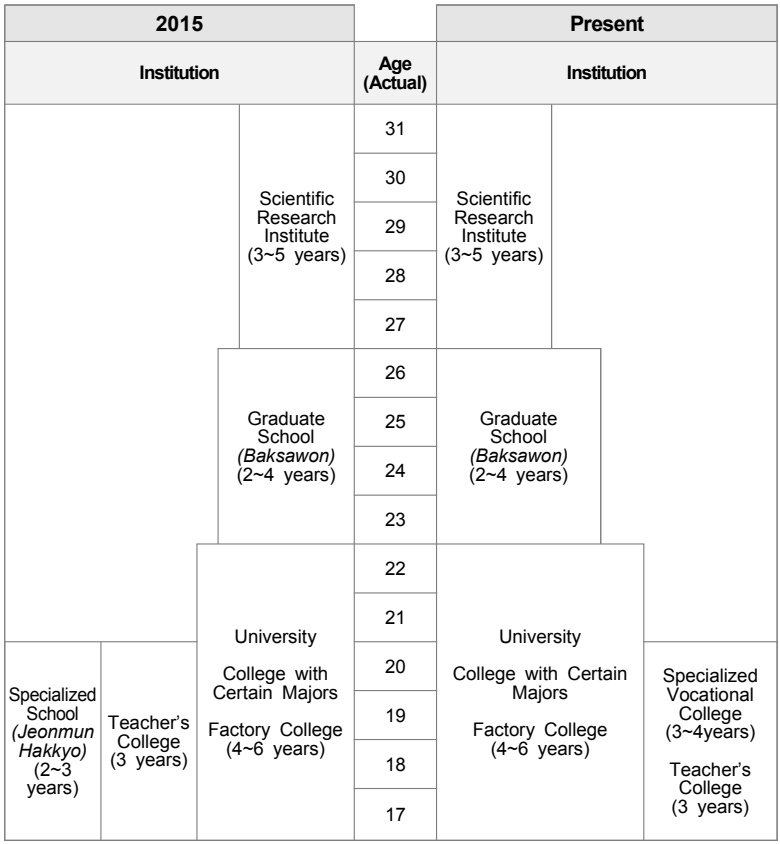
In the third chapter, the study created a list of different types of colleges and universities in North Korea and analyzed their characteristics by gathering basic information such as the names of colleges mentioned in North Korean publications including *Rodong Sinmun*. In addition, this chapter also assessed the characteristics of the college system by examining changes to schools and departments by focusing on leading universities such as Kim Il-sung University and Kim Chaek University of Technology, while also exploring the features for popularization of higher education and Ph.D. programs by examining the current status of distance education and the number of Ph.D. graduates from graduate schools (*Baksawon*).

A. Changes to the Higher Education System

<Figure Ⅲ-1> outlines North Korea's higher education system. The right column depicts the current system while the left column illustrates the previous system before North Korea's Higher Education Act was revised in December 2015. As a result of this reform, the higher education system which was divided into *Jeonmun Hakkyo* (specialized school) with 2~3 year programs and colleges with 4~6 year programs were unified into the current college system. The current types of colleges in North Korea are universities, colleges with certain majors, specialized vocational colleges, and factory (agriculture or fishery) colleges. 'Colleges with certain majors' refer to colleges that are comprised of departments in a specific field. 'Factory colleges,' referred to as an 'education system learning while working' in North Korea, are industry-related colleges that are affiliated with large-scale institutions such as companies, factories, and farms. 'Specialized vocational colleges'

are a new type of college created with the abolition of specialized school (*Jeonmun Hakkyo*) that intensively trains graduates required in the industry field for specific areas. There is also *Baksawon*, which is the equivalent of graduate schools in South Korea, and the Science Research Institute (*Gwahak Yeonguwon*) which continues research after *Baksawon* for 3~5 years.

Figure Ⅲ-1 Changes to North Korea's Higher Education System



B. Current State of Colleges

By gathering information on the names of colleges mentioned in *Rodong Sinmun* as well as other education-related periodicals published since 2012, this study discovered the names of 271 colleges and universities. It is likely that a considerable number of smaller colleges and, in particular, factory colleges and agriculture colleges might be missing from this list. It was reported in early 2012 that approximately 300 colleges and universities and 500 specialized schools (*Jeonmun Hakkyo*) were being operated, and specialized schools were either integrated into existing colleges or upgraded to specialized vocational colleges at around 2016. Based on these facts, it is estimated that the aggregate number of colleges and universities in North Korea ranges between 300 and 400.

There are no private colleges and universities in North Korea, and every college and university is either opened or closed based on authorization by the central government. The most basic criteria that determines the status of colleges and universities in North Korea is whether it is a 'central college' or not. Central colleges are institutions where the admission and placement of students are decided at the national level. University functions are also included in this central college. In addition to these central colleges, there are at least more than one factory college, agricultural college, and medical college and 1~2 primary teacher's college and college of education in each province.

This study analyzed the current state of colleges in North Korea based on the following categorization that distinguishes between levels, types, specialization, and regions described in <Table Ⅲ-1>.

Table Ⅲ-1 Categorizing the Higher Education System

Level	Central College / Regional College
Type	University / College with Certain Majors / Specialized Vocational College / Factory College (Agriculture College, Fishery College)
Specialization	Engineering / Agro-Fishery / Education / Medicine and Pharmacy / Arts and Physical Education / Social Sciences / Natural Sciences / Humanities / General
Region	Pyongyang / Pyongannamdo / Pyonganbukdo / Hwanghaenamdo / Hwanghaebukdo / Hamgyongnamdo / Hamgyongbukdo / Kangwondo / Chagangdo / Ryanggangdo / Nampo / Kaesong / Rason

Among the 271 colleges that were mentioned in North Korean publications since 2012, the number of central colleges was 37, approximately about 10% of the entire number of colleges. In terms of their geographic location, 21 or about 60% of these central colleges are in Pyongyang, as seen in <Table Ⅲ-2>. Outside of Pyongyang, each province has 1~3 central colleges specializing in fields that are related to the region's industrial characteristics.

Table Ⅲ-2 List of Central Colleges

No.	College Name	Location
1	Kim Won Gyun University of Music	Pyongyang
2	Kim Il-sung University	Pyongyang
3	Kim Chaek University of Technology	Pyongyang
4	Kim Hyong Jik University of Education	Pyongyang
5	University of Sciences	Pyongyang
6	Social Science College	Pyongyang
7	People's Economy College	Pyongyang
8	Jang Chol-gu University of Commerce	Pyongyang
9	Choson University of Physical Education	Pyongyang
10	Pyongyang University of Architecture	Pyongyang

No.	College Name	Location
11	Pyongyang University of Science and Technology[7]	Pyongyang
12	Pyongyang Tourism College	Pyongyang
13	Pyongyang University of Transport	Pyongyang
14	Pyongyang University of Machinery	Pyongyang
15	Pyongyang University of Agriculture	Pyongyang
16	Pyongyang University of Fine Arts	Pyongyang
17	Pyongyang University of Dramatic and Cinematic Arts	Pyongyang
18	Pyongyang University of Foreign Studies	Pyongyang
19	Pyongyang Medical University	Pyongyang
20	Pyongyang University of Publishing and Printing	Pyongyang
21	Han Duksu Pyongyang University of Light Industry	Pyongyang
22	Pyongsong Coal Industry College	Pyongannamdo
23	Pyongsong University of Veterinary Medicine and Animal Husbandry	Pyongannamdo
24	Pihyon College of Land Management	Pyonganbukdo
25	Kye Ung Sang Sariwon Agricultural college	Hwanghaebukdo
26	Sariwon Geology College	Hwanghaebukdo
27	Hamhung Hydropower College	Hamgyongnamdo
28	Hamhung University of Medicine	Hamgyongnamdo
29	Hamhung University of Chemical Industry	Hamgyongnamdo
30	Chong-Jin Mineral and Metal University	Hamgyongbukdo
31	Wonsan Agricultural University	Kangwondo
32	Wonsan Fishery University	Kangwondo
33	Chong Jun Taek University of Economics	Kangwondo
34	Huichon Industry University	Chagangdo
35	Hyesan University of Agriculture and Forestry	Ryanggangdo
36	Rajin University of Marine Transport	Rason
37	Nampo Fishery University	Nampo

7) The Pyongyang University of Science and Technology was established through cooperation between South and North Korea in 2010, and educates experts specializing in the fields of engineering and business with unique characteristics. Though this study classifies it as a central college, its process of selecting and admitting students differs from other central colleges.

<Table Ⅲ-3> lists the types of colleges in North Korea. There are five universities in North Korea, and they constitute a low percentage of the entire number of colleges: Kim Il-sung University, Kim Chaek University of Technology, Koryo Songgyungwan, University of Sciences, and Pyongyang Medical University. Colleges with certain majors are the most common with 125 colleges, while 93 or more than a third of colleges are factory, agriculture, or fishery colleges. There are also 48 specialized vocational colleges that were created with the transformation of specialized schools.

Table Ⅲ-3 Types of Colleges

Type of College	Number of Colleges
University	5
College with Certain Majors[8]	125
Specialized Vocational College	48
Factory/Agricultural/Fishery	93
Total	**271**

In terms of major concentration, colleges that focus on engineering are the most common, with 143 colleges as seen in <Table Ⅲ-4>. Colleges that specialize in agriculture and fishery, education, medicine and pharmacy, arts and physical education, and social sciences are the next most common, in that order. The number of colleges per major concentration indicates that majors in North Korean colleges are comprised mostly of applied sciences and engineering that are required for the training of graduates that can contribute to industry, rather than pure science fields. During its industrialization phase, North Korea allocated more than 70%

8) University functions are included in some college with certain majors.

of its college education to the fields of engineering and natural sciences to increase the ratio of STEM-related majors to educate more skilled graduates, and this trend appears to have continued as the ratio remains high, with 77% of colleges in North Korea dedicated to these fields.

Table Ⅲ-4 Specialization of Colleges

Specialization	Number of Colleges
University	1
Humanities	1
Social Sciences	13
Teaching Profession	34
Engineering	143
Agriculture and Fishery	47
Natural Sciences	2
Medicine & Pharmacy	17
Arts and Physical Education	13
Total	**271**

As for regional distribution, <Table Ⅲ-5> shows that 52, or 19% of the total number of colleges, are concentrated in Pyongyang. Outside Pyongyang, there are several colleges located in Hamgyongnamdo, Pyongannamdo, and Pyonganbukdo while Ryanggangdo, Chagangdo, Kangwondo, Hwanghaenamdo, and Hwanghaebukdo are regions with fewer colleges.

Table Ⅲ-5 Colleges per Region

Region	Number of Colleges
Pyongyang	52
Pyongannam	38
Pyonganbuk	26
Hwanghaenam	18
Hwanghaebuk	17
Hamgyongnam	38
Hamgyongbuk	26
Kangwon	16
Chagang	11
Ryanggang	8
Nampo	13
Kaesong	5
Rason	3
Total	**271**

C. Schools and Majors

Under the rule of Kim Jong-un, each college has undergone a restructuring of their system including their schools and courses, and has either created or integrated departments to reflect the transition to the knowledge economy era. This study examined the current state of schools and departments by analyzing the changes at Kim Il-sung University, Kim Chaek University of Technology, and Hyesan Teacher's College.

At Kim Il-sung University, schools and colleges such as electronic automation and forestry science have been created since the 2010s, while Pyongyang Medical College, Pyongyang Agriculture College, and Kye Ung Sang Agricultural College were merged with Kim Il-sung University. As a result of the decision to disintegrate

universities in October 2019, Pyongyang Medical College was separated and renamed as Medical University, and the college system was reconfigured into a school-based system. As of 2020, Kim Il-sung University consists of 21 schools, 151 courses, 87 departments, and 49 affiliated institutions such as research institutes or labs. Departments that contribute to scientific development and meet the needs of the North Korean economy and industry have been installed, while courses that reflect academic progress in the knowledge economy era are also noticeable. Moreover, 49 research labs and other research institutions are affiliated with the schools, and this shows the North's intention to upgrade the university into a research-oriented university by closely linking teaching and research activities at the school and department level.

Along with Kim Il-sung University, Kim Chaek University of Technology is the other primary research-oriented university in North Korea, and currently consists of 17 schools and 49 departments. When comparing the university structure in 2006 to that in 2020, every college has been transformed into a school, while departments have become more detailed, and departments related to the field of advanced science and technology as well as basic engineering have been created. In the graduate schools (*Baksawon*) at the Kim Chaek University of Technology, 20 departments and 105 specific majors are being operated.

The changes to the school and department system at universities have the following features; ① the transformation of colleges within universities into schools, ② an overall increase in, and the further specialization of, departments and courses despite the integration and abolishment of certain schools, departments, and courses, ③ reform of the college system from being course-based

to being department-based, and ④ having a clear direction towards transition to a research-oriented university through the creation of affiliated research institutes.

As for changes at regional universities explored through the case of Hyesan Teacher's College, it is noteworthy that while colleges in the past only consisted of departments without schools, they established a system of schools, departments, and affiliated research labs sometime around the mid-2010s. Another noticeable trend at colleges with certain majors is the installation of distance education school and education school.

D. Current State of Higher Education through Distance Education

Currently, distance education has become the primary method of achieving the goal of 'Making All People Well-versed in Science and Technology.' Distance education in North Korea began in the 1940s with education for adults through mail, which then progressed in the 1970s with educational broadcasting through radio and television, and has further developed in the 2000s with e-learning education based on the use of computers and networks.[9] Distance education has rapidly expanded during the Kim Jong-un era based on the vision of 'Making All People Well-versed in Science and Technology,' and this effort was led by major universities such as Kim Il-sung University and Kim Chaek University of Technology that established the education system and

[9] Ji-Soo Kim, "The State of Distance Education in North Korea and Opportunities for Inter-Korean Cooperation," *The National Research Council for Economics, Humanities, and Social Sciences (NRC) Research Brief*, no. 50 (2019), p. 3, <https://nrc.re.kr/board.es?mid=a10301000000&bid=0008&act=view&list_no=146044&otp_id=> (in Korean).

provided its contents. Distance education in higher education using computers and networks began in earnest in 2010 with the creation of the distance education college at Kim Chaek University of Technology.

Information regarding the exact number of workers that graduate through college distance education or the fields taught has not been disclosed by North Korean media, and only partial reporting has been occasionally done regarding how college distance education has broadened. The college with the most students is Kim Chaek University of Technology where 24,000 students attend the distance education school in about 30 departments as of 2020. There are about 12,000 students at distance education school in Kim Il-sung University, while there are about 10,000 students receiving higher education on teaching through distance education at education-related colleges such as Kim Hyong Jik University of Education.[10] It is estimated that more than 100,000 students are attending distance education colleges, which is a large amount at about 20% of the entire college student population. The establishment of distance education schools was identified at 26 colleges, but more schools are actually administering distance education given that there is some data that indicates more than 50 colleges have installed distance education departments.

In North Korea, distance education is broadly distinguished between 'college distance education' and 'social distance education.' College distance education refers to education based on college curricula, and is administered by providing students enrolled in distance education departments at each college with an ID, with

10) A website of Kim Il-sung University (Inaccessible in South Korea) (Accessed May 27, 2020); *Rodong Sinmun*, May 25, 2020.

which they access their college's distance education homepage and attend courses remotely. 'Social distance education' refers to education provided at public education facilities in the form of lectures and re-education programs, and it is an education carried out in societal education institutions such as the Science and Technology Complex and the Grand People's Study House. In addition to the education at college undergraduate level, distance education is also being used for graduate schools, re-education, and practical training, and covers a wide range of topics including social sciences, science and technology, and foreign language education.

Distance education is available in places such as a room designed to facilitate science and technology, the production site, and at home. The facility that workers can access the most among these options is the science and technology distribution room installed at companies or factories. Though it is possible to access North Korea's intranet by installing a modem at home and connecting a computer, it has been revealed that few North Koreans receive distance education at home because the connection speed is slow and they become subject to supervision if they use computers at home. People can use learning centers not only at factories but also in their communities, in particular, at informatized libraries located in each province and 'Special City,' libraries at central colleges and major colleges in each province, and lifelong learning facilities such as *Miraewon* established at the city and province level. Though computers are primarily used, people can also use tablets. Accessing distance education through various devices has been made possible by the expansion of North Korea's information network. Distance education in colleges combines live conversational

courses and recorded lectures, but in most cases, recorded lectures remain the basic form of teaching.

Distance education in North Korea has following implications and functions. First, distance education is an important tool for achieving the vision of 'Making All People Well-versed in Science and Technology' by providing higher education to workers at factories and companies to distribute scientific and technological knowledge. Second, distance education is an appropriate method of teaching in the knowledge economy era. Third, it is the most effective tool for re-educating workers and teachers working in the field. Fourth, distance education makes lifelong education available to the people, regardless of their age and location. Fifth, distance education can narrow the educational gap between regions and schools. In particular, it is a way to improve the quality of education at institutions such as factory colleges that lack sufficient human and material resources. Given the ongoing COVID-19 pandemic, distance education has also been applied to elementary, middle, and high school education, and is expected to be widened further. But on the other hand, it is perceived that the degree of informatization of education through measures such as distance education appears to vary greatly depending on the region and school, and whether these gaps can be narrowed will determine how successful the efforts to generalize distance education will be in the future.

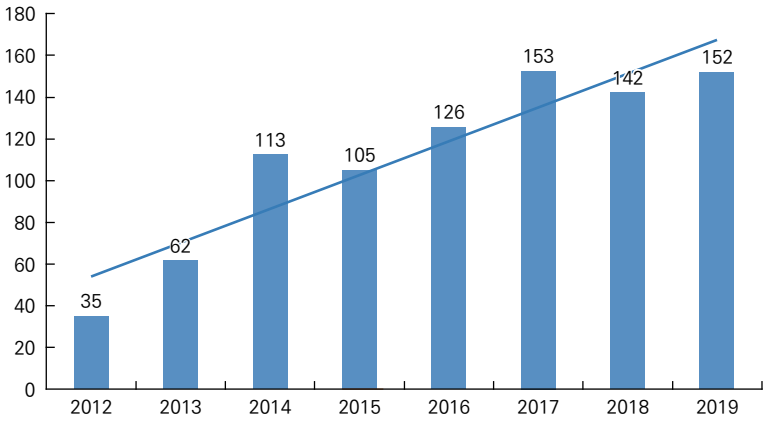
E. Recent Number of Doctorate Graduates

Due to policies strengthening graduate school education, the number of doctorate graduates increased significantly beginning in 2014. Enhancing education at graduate schools and increasing the ratio of students entering graduate schools immediately after receiving their undergraduate degrees is one of the most noticeable changes in higher education policy under Kim Jong-un. Before the 2000s, graduate school education was provided to people that had several years of experience working in the field after graduating college. But the 'continued education system,' in which students enter a graduate school immediately after graduating college, was expanded at around the year 2000, with an emphasis placed on nurturing Ph.D.s in their 20s and 30s. This trend has further strengthened under Kim Jong-un.

In order to assess the degree to which North Korea's policies strengthening graduate-level education have been realized, this study examined the number and characteristics of doctorate graduates mentioned in *Rodong Sinmun* and *Kyoyuk Sinmun* from 2012 to 2019. A total of 888 graduates received their Ph.D.s during this period.[11] The changing trend in the annual number of graduates is depicted in <Figure Ⅲ-2>, which shows that the number of Ph.D. graduates has rapidly increased before and after 2014.

[11] Since the first Ph.D. recipients in 1971, there have been a total of 3,044 Ph.D.s whose affiliations and names have been disclosed as of 2019 at a rate of approximately 54 Ph.D.s per year.

Figure Ⅲ-2 **Increase in Annual Number of Ph.D. Recipients**



Though not expressed in the figure above, it is understood that the average age of those receiving their Ph.D.s has also decreased considerably. The average age of Ph.D. graduates was high before the 2000s because degrees were given to scholars that had made substantial scientific and technological contributions to the state.[12] However, the number of students receiving their Ph.D.s in their 20s and 30s has increased and many professors and lecturers have been replaced by 'teachers of the new generation' in their 20s and 30s.[13]

Looking at where the Ph.D.s graduate from, Kim Il-sung University has the most with more than 30% of the entire number of graduates, while Kim Chaek University of Technology has about 18%. The University of Sciences, Kim Hyong Jik University of

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12) Hyun Suk Oum, "A Study on the Higher Education Policy of Kim Jong-Un Era: Focusing on the Ph.D. System," *National Security and Strategy*, vol. 19, no. 4 (2019), pp. 91~92 (in Korean).

13) *Rodong Sinmun*, July 7, 2007.

Education, and the Pyongyang University of Architecture are next on the list, while the People's Economy College, Hamhung University of Chemical Industry, Pyongyang University of Foreign Studies, Pyongyang University of Transport, Hamhung Hydropower College, Pyongyang University of Machinery, Han Duksu Pyongyang University of Light Industry, and Pyongsong Coal Industry College all had many Ph.D. graduates. Each one of these colleges is one that North Korea is trying to cultivate into 'research-oriented colleges' and 'academia-centered colleges.'

The number of articles published in international academic journals by North Korean scholars has also increased with the number of Ph.D. graduates. North Korea views publishing articles in international journals and actively participating in international academic exchanges as important steps towards building world-class, top-tier universities.[14] According to precedent research, the number of publications in international journals by North Korean scholars has increased during the Kim Jong-un era, and it particularly increased more than 2.5 times in 2015. The study by Choi and Noh reveals that the number of articles published in journals included in the Science Citation Index (SCI) from 2005 to 2015 was 260, mostly in the fields of physics, mathematics, chemistry, material science, and engineering. The authors of these articles were mostly affiliated with Kim Il-sung University, Academy of Science of North Korea, Kim Chaek University of Technology, and University of Sciences.[15] Article submissions to international journals are done in the fields of engineering and basic natural

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14) *Rodong Sinmun*, January 7, 2019.

15) Hyun-Kyoo Choi and Kyung-Ran Noh, *Analysis of SCI Articles by North Korean Scientists: 2005-2015* (Daejeon, South Korea: Korea Institute of Science and Technology Information, 2016), pp. 16-17 (in Korean).

sciences, and it is evident that research is mostly conducted by universities and scholars located in and around Pyongyang.

According to another study that analyzed the articles listed in the Scopus database written by North Korean scholars, a total of 549 articles authored by North Korean scientists were included from 2007 to 2016. The annual increase was 15%, and the rise has been sharper under Kim Jong-un. In particular, the number of articles in Scopus jumped significantly in 2012 and 2015.[16]

[16] Hyun-Kyoo Choi and Kyung-Ran Noh, *Analysis of SCOPUS Articles by North Korean Scientists: 2007-2016* (Daejeon, South Korea: Korea Institute of Science and Technology Information, 2016), p. 6 (in Korean).

4

College Curriculum

The fourth chapter examined recent policies regarding the college curriculum in North Korea, and analyzed the characteristics and changes based on assessments of the curriculum at universities, specialized vocational colleges, and graduate schools. Moreover, the chapter explored which changes have occurred in terms of teaching methods as North Korea pursues the informatization of education.

A. Trends in Recent Changes to the College Curriculum

The college curriculum has been steadily revised since the 2000s. The main policies include reducing the number of common subjects and mandatory courses while increasing elective courses, transitioning from a year-based system into a credit-based one, and increasing the number of computer and advanced technology-related courses.[17] Reforms to the curriculum under the Kim Jong-un regime have continued the process that was already underway since the 2000s. Because the transformation of knowledge is quicker in the knowledge economy era in ways that require enhanced skills utilizing information-related technology as well as creative problem-solving abilities, the curriculum has been reformed to reflect such needs.

Reforms to the curriculum under Kim Jong-un have been implemented based on the principles of 'practicality, comprehensiveness, and modernization.' 'Practicality' means crafting curricula that systematically foster knowledge and skills that can be used to solve

[17] Chun-Geun Lee and Yong-Ho Bae, *North Korean Reforms to its Economic, Scientific, and Technological System and Opportunities for Inter-Korean Cooperation on Science and Technology* (Sejong, South Korea: Science and Technology Policy Institute, 2003), p. 150 (in Korean).

technical issues that arise in the field. To emphasize 'practicality,' North Korea has mandated that the ratio of experiments and training in the field be adjusted to meet the needs of students specific to each department, and the education designed to improve practical skills has particularly been increased at specialized vocational colleges.[18] Furthermore, the North Korean authorities have also attempted to consider the industrial characteristics of the region in which higher education institutions are located when crafting the curriculum.[19] 'Comprehensiveness' refers to updating the curriculum in ways that nurture comprehensive thinking and analytical skills through the integration of departments and promoting interdisciplinary exchanges among fields, rather than maintaining a compartmentalized academic system. This is in response to the needs of the current era, in which interdisciplinary integration creates innovation and new industries are born through the combination of industries. 'Modernization' means the application of theories and developments in advanced science and technology to education, while also referring to education provided through the use of computers and up-to-date experiments and practical training materials. This is an aspect particularly being emphasized in recent reforms to the curriculum, and the North Korean government is requiring frequent revisions to the curriculum to constantly reflect recent developments in science and technology.

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[18] Chun-Nam Kim, "Theoretical Study on the Training of Talent in the Area of Transportation in the New Century" (Pyongyang: Railway Textbook Publishing Co., 2016), p. 154 (in Korean).

[19] Kyung-Sook Kim, *Theoretical Study on the Training of Intermediate Talents in the Industrial Sector in the Era of the Knowledge Economy* (Pyongyang, North Korea: Kim Hyong Jik University of Education Press, 2012), p. 63 (in Korean).

Based on these directions, the recent policies regarding the college curriculum have following characteristics. First, the most fundamental process that North Korea has undergone to reform the college curriculum has been to categorize colleges based on their educational objectives and differentiating the curriculum to reflect these goals. In his speech on September 5, 2014 titled "Let Us Make a Revolution in Education in the New Century to Glorify Our Country as the One of Education and a Power of Talents," Kim Jong-un proclaimed the need to improve the higher education system so that it can produce 'academic students' and 'students with practical skills,' based on the judgement that the existing education system was limited as it was founded on the 'industrial economy era.'[20)]

Second, every college has undergone reforms to their curricula since the mid-2010s by restructuring their schools, departments, and courses to better produce diverse types of skilled graduates and reflect education policy goals. Research-oriented colleges that emphasize educating academically focused graduates have integrated and reorganized their departments, installed inter-disciplinary departments, and in general, have implemented measures to better suit their goal of producing scholarly graduates. There has also been a trend of integrating departments in related fields. In addition to the restructuring of departments, there have been efforts to transition from a focus on the lecture-based college system to the one based on departments. Departments and courses that reflect modern developments in academia as well as science

20) Jeong-Ah Cho, "North Korea's Strategy for Educational Reform Seen through Kim Jong-un's Remarks at the National Meeting of Educators," Korea Institute for National Unification Online Series CO14-13 (2019), p. 2, <https://www.kinu.or.kr/pyxis-api/1/digital-files/bc1ca8ac-ba0f-4a7c-ae9f-c4a72de3e12f>.

and technology have also been newly established.

Third, given the substantial gap in quality between central colleges and local colleges but the limited ability to invest national financial resources to improve colleges, North Korea has instead opted to pursue the 'centralization' of education to improve the general quality of college education. 'Centralization' refers to the strategy of major colleges in each field developing curriculum, teaching methods, and teaching materials, and then distributing this to other colleges in their respective fields while continuing to train academic and teaching activities. In each field, the curriculum and teaching methods of major central colleges are distributed to local colleges and specialized vocational colleges to be administered after being adapted to reflect their respective realities. The colleges that are currently serving as a hub in this centralized system are Pyongyang University of Architecture (architecture), Pyongyang Medical University (medical colleges), Kim Hyong Jik University of Education (teacher training), Pyongyang University of Machinery (machinery), Han Duksu Pyongyang University of Light Industry (light industry), Jang Chol-gu University of Commerce (commerce), Hamhung University of Chemical Industry (chemical industry), Wonsan Agricultural University (agriculture), Pyongyang Computer and Technology College (specialized vocational colleges, factory colleges, and technically advanced middle schools), and Choson University of Physical Education (physical education).[21] In other words, a system has been established in which these colleges function as the 'academic, information, materials-providing and distance education' centers in each field.

Fourth, there have been efforts to revise the graduate school

[21] *Rodong Sinmun*, June 2, 2020.

program and establish a 'continued education system' that links undergraduate and graduate programs for research-oriented colleges. The policy to enroll college graduates immediately into graduate schools to produce younger Ph.D.s in their 20s and 30s began under the Kim Jong-il regime. The process of selecting qualified students among college graduates and admitting them to graduate schools has continued under Kim Jong-un.[22] A pilot program was launched at Kim Il-sung University and Kim Hyong Jik University of Education to continue students' education from undergraduate departments to graduate schools in 2016, and this was expanded in 2017.[23] Continued education has particularly been broadened focusing on classes of advanced students at colleges.

Fifth, an elective curriculum has been adopted at a number of central colleges, and education reflecting the characteristics of the students through such methods with the installation of advanced student classes has been expanded. At certain central colleges like Kim Chaek University of Technology, a system of elective courses has been implemented and operated since the mid-2000s. This system of elective courses was offered sparingly due to limitations in the teaching environment such as a lack of education facilities and teachers, but has recently been expanded, at least partially. Moreover, major colleges have installed advanced student classes to provide dedicated teaching to particularly highly performing

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22) Sung-Geup Cho, "The Struggle of Workers in the Field of Higher Education to Improve and Strengthen the *Baksawon* Project Under the Guidance of the Wise Leadership of the Great Leader Kim Jong-il in Order to Increase the Number of Talents in Their 20s and 30s," *Yoksa Kwahak*, no. 1 (2016), pp. 27~29 (in Korean).

23) Korean Central News Agency (KCNA), *Chosun Central Yearbook: 2017* (in Korean), p. 437; Korean Central News Agency (KCNA), *Chosun Central Yearbook: 2018* (in Korean), p. 256.

students. These advanced classes were installed at the Department of Computers at Kim Il-sung University, the Department of Communications at Kim Chaek University of Technology, and Pyongyang Medical University. As of 2016, advanced student classes in the Departments of Mathematics and Physics are educated at an integrated BA-MA course, and there have been efforts to apply this program to all advanced student classes.[24]

Sixth, as the importance of scientific problem-solving has been stressed, curricula have emphasized 'the combination of education, scientific research, and production' accordingly. Kim Jong-un provided the direction by stating the need to develop "top-tier colleges in the knowledge economy era that closely integrate education, scientific research, and production" during his speech at the 13th National Meeting of Educators held in Pyongyang. Specific measures to closely link education, scientific research, and production were announced at the 5th Plenary Meeting of the 7th Central Committee of the WPK held in 2019.[25] In particular, 'research-oriented universities' transformed their systems from being course-centered to being research-centered, while affiliated research institutions were created to study and resolve scientific and technological issues that arise in the production field.

B. In-depth Comparison of the College Curriculum

This study conducted a closer analysis of changes to the college curriculum by comparing the curriculum at Kim Chaek University of Technology in 2006 to 2017. It also examined the curriculum at

24) *Rodong Sinmun*, November 2, 2016.
25) *Rodong Sinmun*, January 1, 2020.

Kusong Industrial Technology College in 2006, which is a specialized vocational college, and compared its characteristics with that of Kim Chaek University of Technology. Moreover, the study also analyzed the curricula at graduate schools to understand how research-centered education is being implemented.

Kim Chaek University of Technology's curriculum is a five-year course with roughly 290 required credits although they vary depending on the departments. The curriculum at Kim Chaek University of Technology in 2006 and 2017 both consisted of political ideology courses, general courses, basic courses, fundamental major courses, and major courses. The curriculum is divided into the phases of basic education, fundamental major education, and major education. As a stronger connection between education and scientific research has been emphasized, the offering of courses intended to establish a scientific research foundation during the basic education phase has been particularly stressed.

Students enter the fundamental major phase during which they study the foundational concepts, mechanisms, and principles for their respective majors after completing general basic courses. An emphasis is placed on students building a strong foundation of the concepts, mechanisms, and principles during this stage of college education. Moreover, it is also stressed that education should be provided by concentrating on practical abilities based on a comprehensive understanding of the problems.

The major education phase is defined as one in which students conduct scientific research projects in their fields using the basic major-related knowledge gained during the previous phases. Characteristics highlighted in the curriculum are as follows: there should be various types of teaching methods such as lectures,

experiments, practical training; and exercises should be provided appropriately based on the research project that each student is assigned; and that the research objectives and outcomes should be reflected in the syllabus and actual teaching process. Foreign language skills are also taught at the major education phase in order to enhance the ability to translate and comprehend books related to science and technology in their respective fields, and the ability to read science and technology-related materials freely is stated as a major goal.[26)]

According to the curriculum at Kim Chaek University of Technology, courses on social sciences and humanities are sparse, although political ideology is taught from the first year through the fourth year. What is notable is that how English and physical education is taught for all graders except for the graduating year and the year that provides reservist military training (*gyododae*). The ratio of basic courses is high during the first four years in college, and basic mathematic courses are continuously provided throughout the years. Major courses are concentrated during the fourth and fifth years. Although recently there has been a policy to increase the percentage of elective courses, this initiative does not appear to be particularly meaningful since elective courses are mostly operated as designated electives per major.

When compared to Kim Chaek University of Technology, which is an 'academic-type' institution, the curriculum at Kusong Industrial Technology College, a 'practical-type' institution, places greater emphasis on basic major courses and political ideology courses while focusing less on basic courses and foreign language training. Among major courses, several are linked to the production

26) Kim, "Theoretical Study (in Korean)," pp. 180~181.

process with names that end with "device," "measurement," and "design." This reflects the function of the college to produce skilled personnel to work in the field. While universities stress basic scientific and technological knowledge that can be applied to research in a wide range of fields, it is observed that specialized vocational colleges concentrate on detailed knowledge and skills in their specified industries.

Meanwhile, North Korea is currently strengthening education and revising its curriculum at graduate schools with the goal of producing talents necessary for the 'knowledge economy era.' In particular, major courses, courses in related fields, and courses regarding advanced and boundary science have been reinforced while the emphasis has been placed on graduate school students participating in scientific research projects and advanced technology development projects. The first year at graduate schools centers around lectures, while students focus on their individual research projects and dissertation writing from the third semester on.

Lectures consist of written materials by Kim Il-sung and Kim Jong-il (*Kimilsung-Kimjongil Rojak*), foreign languages, and major courses. Students conduct their individual research and write their dissertations from their second year on. North Korea considers the dissertation writing process as an important process in which students systematize the knowledge they have learned and enhance their scientific research skills to hone and sharpen their ability to independently solve real-life problems.[27] The research and dissertation writing process at graduate schools is more or less the

[27] Young-Chan Jang, "Certain Issues Arising from the Organization of and Advisement on the Writing of Graduate Dissertations," in *Case Studies of Education Experience* (2), ed. Jong-Soon Yang (Pyongyang, North Korea: Kim Hyong Jik University of Education Press, 2015), p. 98 (in Korean).

same as any graduate program, but has the unique feature of including '*hyeonsil ryohae* (understanding reality)' which refers to the step of understanding the actual field. This step has recently been emphasized even more to realize the goal of 'closely integrating science, education, and production.'

C. Teaching Methods and Student Evaluation

In general, teaching in North Korea was conducted mainly through lectures by teaching faculty, but recently there have been policy efforts to improve teaching methods. First, the need to transition to teaching methods that focus on the ability to apply knowledge gained through education to solving problems that arise in real-life or in the production field has been stressed, rather than concentrating on a cramming method of education that focuses on unilateral delivery of knowledge. 'Practical' or 'hands-on' educational methods have been proposed as the alternatives. According to the testimony by North Korean defectors that recently attended North Korean colleges, there has been a noticeable change towards encouraging active participation of students through increased hours in experiment labs as well as more discussions and report-writing.

Second, North Korea has emphasized a more organic combination of various pedagogical tools appropriate for the subject being taught and the characteristics of the student. In North Korean curricula and syllabi, the number of credit hours devoted to different formats of courses such as lectures, discussions, and experiment labs is defined. Of course, it is uncertain whether college education follows the instruction of these documents in

actuality. But given the rigid character of the North Korean education system in which the faculty has little freedom in teaching, these various pedagogical methods are presumed to be rather inflexible when it comes to implementation. In order to supplement this policy, an alternative has been suggested recently to appropriately distribute the course-hours for majors among different formats of classes according to the characteristics of the course being taught.

Third, modern pedagogical methods that are based on studies of recent global developments in educational methods have been implemented, centered around the field of engineering. Pedagogical methods such as Conceiving-Designing-Implementing-Operating (CDIO) and Science-Technology-Engineering-Mathematics (STEM) education have been attempted at central colleges that are at the forefront of efforts to centralize the education system, and successful cases are then transferred to other colleges.

Fourth, courses that utilize computers, multimedia materials, and computer networks have been encouraged to stress the importance of informatization of education. The informatization of education has been a priority of efforts to improve educational methods since around the 2000s, and the degree to which this has been implemented has increased in accordance with the level of informatization of the North Korean society. In particular, noticeable improvements have been made in terms of the development and distribution of multimedia material, development of online lectures, provision of distance education, and the sharing of educational resources through the national network. But there also appear to be large discrepancies in terms of how this is being implemented across regions and colleges. At central colleges located in Pyongyang, computer networks have been installed on

campus and the use of multimedia materials for education has become widespread with the installment of computer facilities, while textbooks have been distributed to certain colleges in the form of electronic files. In comparison, the informatization of education or the use of multimedia materials is not as common at regional colleges.

There have also been changes in terms of how students are evaluated. The performance of students in North Korea is assessed using a five-grade system. In the past, colleges assessed students typically using short answer and written exams or oral exams, but the method of evaluating students has been diversified to include objective measures, such as single-choice questions, due to policies to improve evaluation and testing. Moreover, exams using computers or distance testing have been actively implemented for both college admission exams or at colleges since the mid-2010s. This has been based on the conclusion that distance testing through the use of computers is better in terms of the reliability of exams, budgetary efficiency, and standardization. Distance testing has been implemented across the country for college admission standardized tests since 2017, while computer-based testing has been expanded for college exams, beginning with central colleges.

5

Conclusion

As the study has shown above, higher education in North Korea has undergone significant changes in terms of its system and policies under the Kim Jong-un regime. North Korea's higher education reform has been undertaken to meet the needs of the knowledge economy era and information era, following the international trends in education. During this process, specific measures have been adjusted to reflect the characteristics of the North Korean regime and the reality of its education system, as well as the needs of the North Korean economy and industry. The higher education policies of North Korea over the past several decades, such as integrating and reorganizing colleges as well as restructuring departments, have not conformed to a single directionality. Rather, various attempts at reform and the process of trial and error can actually be defined as one of the main features of higher education reform during the Kim Jong-un era.

Despite this, higher education reform in North Korea implemented based on the national vision of 'Making All People Well-versed in Science and Technology' is expected to accomplish both an overall increase in the provision of higher education as well as achieve qualitative improvements in several aspects. First, it is anticipated that North Korea will achieve the quantitative achievement of expanding higher education in that the number of people receiving higher education will increase through distance education. Statistics Korea estimates the number of North Korean college students based on data such as the 2008 North Korean census or other sources of data occasionally provided by international organizations. By calculating the number of college students per national population using such metrics, the number of college students per capita is estimated to be about a third of that of South Korea.[28] Given the

reality in North Korea where soldiers constitute a high percentage of college-age population, it is difficult to achieve the popularization of higher education by admitting college-age people to regular colleges. As a result, North Korea has instead attempted to expand opportunities for higher education and achieve the goal of 'Making All People Well-versed in Science and Technology' by establishing distance education departments at major colleges and expanding these programs. This is a method that does not impact the military or the production capacity of the industry. This is also a way in which higher education opportunities can be more widely offered with fewer financial resources, compared to investing in the regular college system by constructing college buildings or other physical facilities and increasing the number of faculty members. Due to these advantages, coupled with the unique nature of the North Korean society, North Korea is expected to continue to promote the expansion of higher education and the goal of 'Making All People Well-versed in Science and Technology' through distance education for the foreseeable future.

Second, in addition to the regular higher education system, education for adults in the form of work-related training or re-education programs has been expanded and strengthened through distance education, the installation of information networks, and the establishment and greater utilization of science and technology databases, and this trend is also expected to continue for the foreseeable future. As the informatization of education is

28) According to data from Statistics Korea, there were 519,000 college students in North Korea and 3,027,000 college students in South Korea as of 2018. Statistics Korea Portal for Data on North Korea, <https://kosis.kr/bukhan/> (Accessed October 20, 2020). This is 2.07% and 5.87% of the entire population in North Korea and South Korea, respectively, calculated by dividing the number of students by the entire population (25,132,000 in North Korea and 51,607,000 in South Korea).

further emphasized in the Kim Jong-un era, universities such as Kim Chaek University of Technology as well as the colleges with certain majors central to each industry have developed and distributed content for science and technology education. These materials are being used not only at colleges but also at facilities such as electronic libraries and *Miraewon* in each province, city, and county. Though the supply of electricity is scarce and information technology (IT) equipment is limited, education for adults using information networks will continue to increase with gradual improvements to the information and network infrastructure.

Third, from a qualitative perspective, there is the possibility that policies such as the expansion of departments and courses related to advanced science and technology, reforms of the curriculum and teaching methods, and promotion of the informatization in education will result in a certain level of improvement not only in the quality of education but also the capacity of graduates. In particular, reforming graduate-level education in a way that is concentrated on research abilities, and revising the curriculum and teaching methods to be centered on the capacity to explore and solve problems, are expected to improve the quality of education to a certain extent since those are policies that were not attempted in the past.

While these accomplishments are expected as a result of North Korea's reforms to its education policies and systems, there remain certain chronic issues regarding North Korea's higher education as well as problems and limitations associated with the characteristics of the North Korean regime. First, the fact that reforms to its higher education currently being implemented are being attempted within the framework of a socialist education system will hinder

the effectiveness of such reforms. This includes, for example, how the admission of college students and the employment of graduates are dictated by national planning, how colleges have little freedom in terms of how education is managed, and how students are unable to choose their careers after graduation. This type of system creates a gap between the policy intentions of the state and the choice of actors. As the testimonies of North Korean defectors illustrate, while North Korea hopes to select gifted individuals and admit them to the continued education program that links undergraduate and graduate education, students instead prefer to enlist in the military upon graduation and become a party official, rather than go to a graduate school. Moreover, the North Korean industrial system in which individual companies are operated in close connection with the party and administrative agencies in each jurisdiction based on national plans is not well suited to accommodate multidisciplinary education necessary in the knowledge economy era. To effectively promote higher education reforms under these conditions, North Korea will need to drastically overhaul the systems governing student admissions and graduate employment. The success of North Korea's higher education reform will likely be determined by whether it is expanded to address these more fundamental aspects of its system.

Second, North Korea's military system which requires college-age individuals and especially males to serve in the military for an extended period of time is a factor that obstructs the continuity of education and limits the efficiency in which highly-skilled individuals are trained. With the implementation of 'mandatory military service of all the people,' North Korean men and women serve 10 and 7 years in the military, respectively.[29] In particular,

most men, apart from those specially exempt such as those in schools for gifted students or those that fail to meet physical standards for military service, enlist immediately after graduating a high school. Though some soldiers can enter college after serving for a certain amount of time and receiving a recommendation for college admission, they perform considerably worse than college students that begin college right after graduating from high schools. A system that mandates a lengthy military service can act as an obstacle that limits the effectiveness of college education and restricts improvements to the quality of education, particularly in the knowledge economy era in which the speed of scientific and technological development is rapid.

Third, while science and technology education is being emphasized in the Kim Jong-un era, political ideology education still remains predominant overall.[30] Various courses on political ideology are provided as basic courses at colleges, and there remains a policy in which more than 20% of all credit-hours are devoted to political ideology education. An emphasis on political ideology education will serve as a counteracting force against the nurturing of creativity, the ability to think creatively, and innovative minds that education in the knowledge economy era aspires.

Fourth, as noted above, most colleges in North Korea are smaller colleges that are comprised of a few departments and majors in a narrow field. For North Korea to achieve its goals of cultivating 'research-oriented colleges' and 'top-tier colleges' and

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29) Institute for Unification Education, *Understanding North Korea, 2020* (Seoul: Institute for Unification Education, Ministry of Unification, 2019), p. 144.

30) The number of hours dedicated to political ideology education at middle schools, for example, has actually increased during the Kim Jong-un era. Jeong-Ah Cho et al., *North Korea's Education Policy, Curriculum, and Textbooks during the Kim Jong-un Era* (Seoul: Korea Institute of National Unification, 2015), p. 46 (in Korean).

make education more efficient in general, there is a need to increase the size of colleges to a certain extent through college integration. It is difficult to increase the number of elective courses and promote interdisciplinary exchanges between the humanities and social sciences with natural sciences which is an international trend in the knowledge economy era when there is a small number of students due to a lack of scale efficiency. These factors will limit the ability to conduct large-scale research projects. Efforts such as the abolishment and integration of *Jeonmun Hakkyo*, and the vigorous policy to increase universities in the mid-2010s which has now been reversed, were attempts to address this issue. Whether North Korea is able to pursue the expansion of appropriately sized colleges while addressing the internal problems that have limited North Korea's ability to integrate colleges will determine how effectively North Korea can improve the efficiency of college management.

Fifth, North Korea's limited education budget and the 'self-reliant' budgetary system of individual colleges is a systemic problem that hinders the development of North Korean colleges. The budget allocated to education as a percentage of North Korea's GDP was 8.00% in 2006,[31] which is low, less than half of that of South Korea.[32] Kim Jong-un has also recognized this problem and ordered "a substantial increase to national investment in educatio n"[33] while also calling for efforts by the Education Department

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31) Jeong-Ah Cho, "North Korean Education Seen through Statistics," Statistics Korea, p. 11, <https://kosis.kr/bukhan/nkAnals/selectNkAnalsList.do?menuId=M_02_01> (Accessed October 25, 2020).

32) In 2019, the budget for the South Korean Ministry of Education is 18.7% of the entire government budget. Ministry of Education, Korean Educational Development Institute (KEDI), Summary of Education-Related Statistics, 2019 (Jincheongun, South Korea: KEDI, 2019), p. 58.

33) *Rodong Sinmun*, September 6, 2014.

and local government agencies. In addition to the low percentage of the central budget allocated to education, North Korea has concentrated its national financial resources to certain parts of its higher education system such as selected universities, central colleges, and college that specialize in areas such as IT, biotechnology (BT), and energy that have garnered national attention and resources. The building of infrastructure is also based on the field guidance direction of the dear leader, and other colleges must acquire facilities and teaching materials independently through assistance from the local community. Colleges are forced to pass these costs onto the students, but this process is conducted unofficially and secretively rather than through an official route because North Korea still maintains its stance on providing free tuition.

The uneven allocation of the national budget for education is a factor that deepens the existing regional and institutional gap. It appears that North Korea has adopted its strategy of 'centralizing education' to reduce such gaps in higher education. This has resulted in the policy of concentrating investment to a few colleges that serve as the hub for each field rather than distributing resources evenly to a wider number of colleges, requiring these chosen colleges to develop better curricula, teaching methods, and teaching materials which are then distributed to other colleges. This method may achieve partial success given the nature of education in North Korea in which the central government can control how colleges are managed, but it appears that local colleges that have fewer resources will face problems in trying to implement the curricula and teaching materials developed at the national level. While the quality of education at local colleges may be improved in the short-term, it appears that this approach of centralized supply

will be limited in enhancing the freedom and autonomy of individual colleges. Obtaining more financial resources for education and reforming the expenditure system are necessary to improve the fundamentals of higher education.

Lastly, it is imperative for North Korea to escape international isolation and revitalize international cooperation in order to properly nurture human resources that will lead the knowledge economy era. North Korea is currently attempting limited international exchange and cooperation through measures such as importing information regarding advanced technologies, promoting exchange student programs, publishing articles in international journals, and participating in international academic conferences, all at a very rudimentary level. North Korea needs to alleviate the current situation of economic sanctions and fundamentally transform its closed system to significantly enhance its level of education.

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