



IF YOU DO NOT WANT THEM TO KNOW, DO NOT TEACH THEM STATISTICS? (STORY OF NORTH KOREAN MATHEMATICS)

Jung Hang Lee
Mathematics Department

It has been more than sixty years since Korea was divided into two separate countries – the Democratic People’s Republic of Korea (North Korea) and the Republic of Korea (South Korea). After the Korean War (1950-1953), these two countries have developed political, social, and educational systems under conflicting ideologies. North Korea developed into a unique form of socialist country, whereas South Korea became a democratic country. Even after the events of the Berlin Wall and the Soviet Union, North Korea remains one of the most closed-off nations in the world. The separation has resulted in two different Koreas with radically different current status. In 2017, the nominal Gross Domestic Product (GDP) of South Korea was \$1.578 trillion, which ranked 11th in the world. In 2014, South Korea was the seventh largest exporter and importer in the world. However, North Korea still remains as one of the poorest countries in the world.

This research examines North Korea’s secondary mathematics education alongside social and political prospective. North Korean secondary mathematics textbooks and curricula have been examined and analyzed. Facts and conclusions have been disclosed. However, large fractions of the North Korean mathematics educational system, including its teachers, students, and dynamics of the actual classrooms, still remain unknown, as North Korea maintains its isolation.

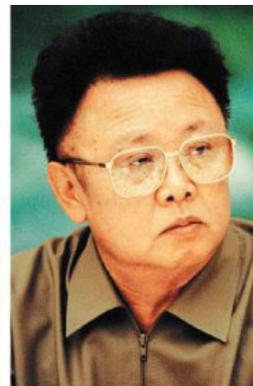
BACKGROUND INFORMATION

From 1910 to 1945, Korea was a Japanese colony and its education system was influenced by the Japanese model. However, the Korean War broke

out shortly after the liberation. North Korea was supported by the USSR and China; and the Western allies led by the United States aided South Korea. As the war ended in 1953, two countries were formed on the Korean Peninsula. North Korea, under the governance of Kim Il Sung, belonged to the so-called socialist bloc. As North Korea gaining autonomy from the neighbouring great powers, Kim Il Sung declared his country’s mission to consist in following its own version of Marxism-Leninism, called “Juche”. *Juche* has been variously translated into English as “self-identity”, “national individuality”, and “national identity” or “self-reliance”. The dictatorial regime of Kim Il Sung, his son Kim Jong Il, his grandson Kim Jong Un and the Workers’ Party of Korea, which was under their control, led the country into an extreme poverty, particularly during the so-called “March of Suffering”, a prolonged period of economic decline that lasted from 1990 to 1998. It is estimated that 2.5 million people, which is about 10% of total population, died from starvation during this period. Soon after Kim Jong Il’s death in 2011, Kim Jong Un, who is a grandson of Kim Il Sung, became the chairman of the Worker’s Party gaining full control of the country.



■ Kim, Il Sung
(1912/4/15~1994/7/8)
■ Political leadership
between 1948~1994
(47 years)



■ Kim, Jong Il
(1941/2/16~2011/12/17)
■ Political leadership
between 1994 ~ 2011
(17 years)



■ Kim, Jong Un
(1984/1/8 ~)
■ Political leadership
from 2011 ~ present

A new educational system took shape and continued to operate to a certain degree even during the most difficult and problematic years. The highlights in the development of this educational system included the establishment of a compulsory nine-year mandatory education in 1966 (four years of elementary and five years of secondary education), and then a 11-year mandatory education in 1975 (one year of kindergarten, four years of elementary, and six years of secondary school), and the publishing of *The Theses of Socialist Education* (Kim, Il Sung, 1977), which summarized and propelled socialist education in North Korea. As Kim Jong Un came to power, it was revised as a twelve-year mandatory education (one year of kindergarten, five years of elementary, three years of middle school, and three years of high school).

School System and Curriculum

In secondary schools in North Korea, the principal oversees the whole school, especially administrative and financial matters. The vice principal should be a member of the Worker's Party and work as a Secretary of the Workers' Party at his school. The vice principal manages teachers and is responsible for monitoring the educational ideology at the school. The vice principal also observes the curriculum and its implementation. North Korea has a national curriculum that does not give students or the schools any choice. For instance, only one set of national textbooks for all the secondary students is available and the curriculum is strictly controlled by the Workers' Party and represents the educational direction of the Workers' Party. Even the details of the date and time of chapter allocations is set and reinforced by the Ministry of Education in The Workers' Party.



Number of Hours of Middle School Curriculum Subjects by Grade Level (adapted in 2013)

Subject	Grade				
	Total Hour	1st	2nd	3rd	%
Revolutionary Activities of our Great Leader Kim, Il Sung	136	2	2		3.9
Revolutionary Activities of our Great Leader Kim, Jong Il	136		2	2	3.9
Revolutionary Histories of Anti-Japanese Heroine Comrade, our mother Kim, Jung Suk	34	1			1
Revolutionary Histories of our Great Leader Kim, Jong Un	102	1	1	1	3
Moral of Socialism	102	1	1	1	3
Total	510	5	6	4	14.8
Korean Language	510	5	5	5	14.8
English	408	4	4	4	11.8
History	136	1	1	2	3.9
Geography	102	1	1	1	3
Total	1156	11	11	12	33.4
Mathematics	578	6	5	6	16.7
Natural Sciences	510	5	5	5	14.8
Total	1088	11	10	11	31.5
Information Technology	192	2weeks	2weeks	2weeks	5.6
Basic Technology	102	1	1	1	3
Total	294	1	1	1	8.5
Physical Education	204	2weeks	2weeks	2weeks	5.9
Music and Dance	102	1	1	1	3
Art	102	1	1	1	3
Total	408	4	4	4	11.8
weekly hours		32	32	32	

Structure of a Mathematics Class and Reinforcing the Policy of the Party

According to Teacher A, secondary school mathematics classes in North Korea consist of 45 minutes with five mandatory phases--*Dea Sal Li Gi* (Reviewing), *Sook Jea Gum Yule* (Checking Homework), *Dang Jung Chek Wha* (Reinforcing the Policy of the Party), *Sae Ji Sik Ju Gi* (Delivering New Knowledge), and *Da Ji Gi* (Fortifying the Knowledge). There is a 10-minute break between each class and all teachers receive a memorandum from the local board of education on the appropriation of time to each class).

Steps	Time Allocation (%)
Dea Sal Li Gi (Reviewing)	3 minutes (6.7%)
Sook Jea Gum Yule (Checking Homework)	2 minutes (4.4%)
Dang Jung Chek Wha (Reinforcing the Policy of the Party)	7 minutes (15.6%)
Sae Ji Sik Ju Gi (Delivering New Knowledge)	28 minutes (62.2 %)
Da Ji Gi (Fortifying the Knowledge)	28 minutes (62.2 %)

Even in the mathematics classes, Juche ideology is imposed in the form of *Dang Jung Chek Wha* (Reinforcing the Policy of the Party). Many teachers identify themselves as one who contemplate on the *Dang Jung Chek Wha* (Reinforcing the Policy of

the Party) much more than other teachers. There is no guidebook or teacher's manual for teaching this section, but some materials are provided when teachers attend the teacher education programs that are held every summer and winter break. Teachers have to come up with how to connect the Policy of the Party with the materials that they present in class.

Mathematics Teachers and the March of Suffering

During the March of Suffering (1990~1998), survival of the nation was challenged. It was estimated that 2.5 million North Koreans died from starvation between 1995 and 1997. Many teachers had to appeal to the local board of education and they gave 10 days of food instead of the whole month. However, even this was only in 1991 and after that, any support was completely stopped. Teachers did not get any food or money at all. It was even more difficult for elderly and disabled people. They also did not receive anything and most of them died. The attendance at schools gradually dropped to 70% and morning classes would operate normally but afternoon classes were often canceled because the teachers had to go elsewhere to find food. One reason why the North Korean educational system was able to survive during the March of Suffering was because teachers were relatively free from materialism. One should always remember that North Korea is a socialist country. The main driving force of the society is not money, but a revolutionary socialistic ideology. In a way, North Korean teachers were protected from materialism. They were educated to work not because we were getting paid, but to participate as a member of the society who would achieve the socialistic revolution. That may be one of the reasons why the North Korean teachers kept on teaching without any paycheck for all those years.

The entire nation suffered greatly during and after the March of Suffering, when the economy collapsed. Yet, North Korea maintained its educational system, focusing on the gifted and special schools such as the First High Schools to preserve the next generation. The limited resources were concentrated towards

gifted students. Students were tested and selected at the end of elementary school. Those who taught at the First High School were getting paid about 50% to 60% of the salary during the period.

Probability and Statistics Section

The chapter "Probability and Statistics" is relatively new in North Korean secondary mathematics. Most teachers were not properly trained to teach probability and statistics. Even when they learned probability and statistics at a teachers' university, they never had to understand the subject in depth since they did not have to teach the subject. In a socialist country such as North Korea, neither probability nor statistics was regarded as important concepts. The development of probability was necessary for gambling in a capitalistic society and statistics helped to predict social phenomena closely related to insurance. Regardless, gambling, casinos, the lotto, stock market, or insurance companies do not exist in North Korea. For instance, in the textbook, the concept of probability is introduced with an example using a die, which is preceded with a physical description of a die since North Korean students do not know what a die looks like. This may be also motivated with politically driven purpose. When students start to learn more about statistics it would take more than just a number to convince them. Government may not be able to control people with just a final result. People will start to question about the numbers and they might want more explanations which are also statically convincing.

CONCLUSIONS

This research attempts to answer questions about North Korean secondary school mathematics: What are characteristics of secondary school mathematics education in North Korea in terms of its concepts, goals, and structure? One observable characteristic of North Korean secondary school mathematics is the strong ideological and political influence of the Worker's Party. While mathematics is generally viewed as a politically and ideologically neutral subject elsewhere, Juche ideology and the policy

of the Party, imposed in the form of Reinforcing the Policy of the Party, are mandatory in every North Korean mathematics class. The North Korean government stubbornly emphasizes this section's importance in mathematics classes and in professional development programs, and also strictly imposes observed inspections to make sure this section is being taught. A totalitarian society is totalitarian precisely because its reigning ideology is omnipresent.

The March of Suffering affected every aspect of secondary-school mathematics education in North Korea where the teachers as well as the students had to endure extremely devastating economic difficulty. As a result, general secondary school mathematics has been neglected and deserted. During this time of difficulty, it was impossible to teach or learn mathematics because they were too hungry to concentrate. Teaching hours and mathematics content were compromised as well.

There appears to be a disconnect between equality based on socialistic ideology and reality in North Korean secondary school mathematics. While North Korea emphasizes socialism as its main governing ideology in its promotion of equality for all people, in reality, equal opportunity is not provided or promoted in the context of secondary school mathematics. The lasting effect of the economic difficulty has only widened this gap. Because of limited resources, focus turned towards gifted education, such as the First High Schools, in order to educate and produce the next generation leaders and workers.

In North Korea, there is one set of national textbooks for all secondary students and the Workers' Party of Korea strictly controls the curriculum. The curriculum guide is forwarded from the Ministry of Education in the Workers' Party and contains detailed instructions, including specific time allocation for each topic to be covered. It is clearly apparent that the North Korean government has full control over the mathematics content and curriculum that is being taught.

They did not teach probability and statistics for a

long time because North Korea is a socialist country that does not have insurance, stock market, and gambling. And that discouraged the need to teach probability and statistics. Also, it seems intentional not to teach statistics to the general public. It would be much easier for North Korean government to control the public if they do not have any conceptual understanding of statistics. Yet, the latest textbook includes the chapter "Probability and Statistics" in the secondary mathematics textbook. It was considered a necessary change to adapt to international circumstances, such as the changes taking place in the Soviet Union and in China.

Teaching and learning mathematics should have a clear purpose. We have been teaching and learning mathematics and statistics. Once they learn, they will ask. Someone has to answer, not just with moving speech, but with convincing result with number. The p-value should be small enough to convince them.

BIOGRAPHICAL PROFILE

Dr. Jung Hang Lee earned his Ph.D. in Mathematics Education from Teachers College, Columbia University. He has a B.S. in Computer Programming and Applied Mathematics (Operations Research), M.S. in Applied Mathematics (Engineering Mathematics) and M.A. in Mathematics Education. He is an Assistant Professor in the Mathematics Department at Hostos Community College since Fall 2018. Dr. Lee was an Associate Professor at Nyack College for seven years before he joined HCC. He has been teaching mathematics for over eighteen years. He was elected as the best analyst when he worked for the National Security Agency (NSA), USA and Defense Security Association (DSA), South Korean Army. He was awarded as an emerging scholar of the year (2013) in Nyack College. He presented his research on North Korean Secondary School Mathematics at the 12th International Congress on Mathematical Education as an invited lecture. His main research interests are student motivation, mathematical concept map, assessment and North Korean mathematics education.