Croatian Journal of Education
Vol.23; No.1/2021, pages: 9-33
Review paper
Paper submitted: 12th November 2019
Paper accepted: 20th May 2020
https://doi.org/10.15516/cje.v23i1.3810

Changes of Korean Education and the Fourth Industrial Revolution

Yoon-Cheol Park
Department of English Education, Kyungnam University

Abstract

A society's reality should be reflected in education, that is, educational methods need to keep up with the times. The purpose of this research is to examine the educational methods for the era of the Fourth Industrial Revolution in the education system of Korea. The sample of the research targeted the Korean education system from 1960 to the present in the context of the Fourth Industrial Revolution. A literature review and a descriptive approach were applied to analyze the sample, and the findings indicate that the education system of Korea may be classified into three stages from 1960 to the present. The first stage was nationalism, driven by the government, from 1960 to 1994; the second stage was liberalism, which emphasized autonomy, from 1995 to 2015; and the third stage was creativity for the era of the Fourth Industrial Revolution, from 2016 to the present. These results indicate that the education stages of nationalism and liberalism still exist in Korea and that past education methods, such as mass education, have not been replaced. The Fourth Industrial Revolution requires fusion and collaboration in the education sector, and a personalized learning system, which values individual talents, experiences and aptitudes, will expectedly be a crucial factor in determining the educational methods of Korea in the Fourth Industrial Revolution, as this research suggests.

Key words: *collaboration; creativity; fusion; mass education; personalized learning system.*

Introduction

Education is considered an important factor in determining a country's power and future value. Over the past 60 years, South Korea has experienced major changes in the field of education. These changes have affected its politics, economy, and culture; and

now, Korea is facing another one. In fact, the education of Korea is connected with its social and economic development and has always been symmetrical to government policy. Therefore, the education system of Korea has been influenced by social needs and the government education policy and is controlled by the government even today. Moreover, actual education methods used in schools and colleges have not greatly changed from the past. Most teachers emphasize memorization to their students and prefer to base their classes on theory. However, this approach may not be appropriate for the social demand for creative talent in the digital revolution era (Park, 2016; Yoon, 2014; Chung, 2017a, pp. 53-72).

As society develops, education methods and programs need to be adjusted and altered. In this respect, the Korean education system currently confronts a new challenge in preparing for the era of the Fourth Industrial Revolution, 'which changes the world by the products of technology, including robotics, drone, artificial intelligence, nanotechnology, biotechnology, Internet of Things, 3D printers, etc.' (Chung, 2017b, p. 15). The Fourth Industrial Revolution, which requires creativity, fusion, and collaboration, will be different from the current environment, and creative people will be required in a variety of fields. Thus, the existing approach will not solve the various problems of education, and it raises the following question:

Most teachers at schools and colleges in Korea still teach students with the rote-learning method, which is not effective for fostering creative students. Then, what education methods and systems should the Korean government prepare?

Answering this question is not easy, but the solution may be found in a personalized learning system which emphasizes individual talents and creativity. The current education system and programs in Korea have an interest in fostering creative students. This means escaping from the existing education system and discovering new education methods that respect and respond to individual ideas.

The purpose of this research is to examine the education methods for the era of the Fourth Industrial Revolution in the education system of Korea. The background of the research is based on two facts: first, there are few studies that have investigated the education system of Korea from the macroscopic point of view to prepare for the era of the Fourth Industrial Revolution, and second, new education methods such as a personalized learning system should be suggested to replace past education methods such as memorization. The process is not simple, but signals change in the Korean education system.

Methods

To achieve the purpose of this research, we used a literature review and a descriptive approach. The literature review examines previous studies on the education system of Korea from 1960 to the present, and the descriptive approach compares the results of the collected data with the educational system and methods needed for the Fourth Industrial Revolution. These two methods allowed us to provide insights into the necessary changes

in Korean education and helped us identify what education systems and methods are needed for the Fourth Industrial Revolution.

In the literature review, it is important to identify the changes and the course of the Korean education system based on previous studies. Here, we take advantage of the correlations between educational policy and the social sector, and between the education system and its methods from the macroscopic point of view. In particular, the development of Korean education (Park, 2016) and education methods for the Fourth Industrial Revolution (Chung, 2017b) will help us predict the directions of the Korean education system. Above all, a personalized learning system (Graf & Kinshuk, 2012; Seel, 2012, pp. 2594-2596) will function as a new educational method in preparing for the era of the Fourth Industrial Revolution. On this basis, the literature review offers a foundation for improving the educational system in response to the reality in Korea.

The descriptive approach analyzes data on the development of the Korean education system, based on the results of the literature review. In addition, it suggests proper alternatives relevant to the present education system, methods, and programs of Korea for the era of the Fourth Industrial Revolution. To do so, we first examined the reality of the Korean education system and the characteristics of the Fourth Industrial Revolution. Namely, we inquired into the education plan of the Korean government in terms of preparing for the era of the Fourth Industrial Revolution and what type of education methods are effective. Project-based learning and online courses (Paek, 2017, pp. 13-51) are popular in Korean colleges, and the government has pushed for them to enhance students' learning capability. To identify this educational context, this research offers a sample of changes in the Korean education system in the next section.

Sample

The sample used in this research is limited to the Korean education system from 1960 to the present and the content of the Fourth Industrial Revolution. The reason is that the research is intended to critique Korean educational policy and review the new educational methods needed for the Fourth Industrial Revolution. The changes in Korean education may be divided into three stages (Park, 2016; Yoon, 2014, pp. 4-17):

1) First stage – the education phase from 1960 to 1994, which is called education 1.0, was driven by the central government and focused on nurturing mid-level skilled workers through education;
2) Second stage – the education phase from 1995 to 2015, which is called education 2.0, led to the participation of education consumers in the curriculum;
3) Third stage – the education phase from 2016 to the present, which is called education 3.0, was designed to nurture creative minds.

The above-mentioned stages of educational change show Korea's educational history from 1960 to the present. The boundaries between stages are distinguished by educational philosophy, policy, and economics. Besides, each stage reflects actual characteristics of the Korean education system. These characteristics have evolved from social demand,

and they provide the groundwork for designing the education system and methods needed for the era of the Fourth Industrial Revolution.

As another example, this research makes use of the definition of the Fourth Industrial Revolution (Schwab, 2016) and its characteristics (Kim, 2016). The Fourth Industrial Revolution is connected to the education method like a personalized learning system because digital technologies will change the education environment of schools and colleges. Then, we will analyze the three stages of the Korean education system in the next section.

Analysis

Nationalism, from 1960 to 1994

Since the 1960s, Korea's society has greatly developed and in its education history, the period from 1960 to 1994 is called the era of nationalism, or education 1.0. During this period many companies needed a cheap labor force for mass production due to the growth of light and heavy industries. Also, this period can actually be divided into two phases: first, the quantitative growth of education from 1960 to 1980, and second, the qualitative change from 1981 to 1994. These two periods highlighted education that nurtured unskilled and mid-level skilled employees. To cultivate these human resources, the Korean government planned and determined the education policy and directions. Therefore, the government intervened in all education systems and programs, so that education was controlled by the government and prioritized nationalism.

In these conditions, the most efficient teaching method was memorization. This was an easy, straightforward, and passive method that was helpful for industry, which needed many mid-level skilled laborers. Moreover, this education system was intended to meet the social needs of generalization and quantitative growth for mass production. Table 1 (Yoon, 2014, pp. 4-17) shows the stage of Korea's educational development called education 1.0.

Table 1

Developmental stages of Korean education, 1960~1994

	1960~1980 Quantitative growth: education for economic development	1981~1994 Qualitative change period
Economy	Export-oriented industrialization Rapid growth period	Restructuring of economy Stable growth period
Education	Secondary education expansion	Higher education generalization
Focus	Quantitative growth Effectiveness and control	Quality of education Autonomy Accountability
Policy	Secondary education extension Equalization of education Vocation education and training	Local education autonomy Qualitative improvement of education Higher education generalization

As Table 1 shows, the education system and policy are closely related to economic growth. The period from 1960 to 1980 was a time when the country needed many mid-

level skilled laborers due to rapid economic growth. In this period, most workers were secondary school graduates. Hard work and honesty were encouraged by such education policies as the expansion of secondary education, the equalization of education, and vocational education (Yoon, 2014, pp. 6-17). Furthermore, the supply of educational services was in harmony with the demand of the labor market, and educational innovation was also promoted to produce high-quality laborers at lower costs.

On the other hand, the education system of Korea from 1981 to 1994 sought qualitative changes such as higher education, adult retraining programs, and education's informatization (Yoon, 2014, pp. 11-13). In other words, this period required the autonomy and qualitative improvement of education. In fact, the Korean Ministry of Education wanted the education system to favor appropriateness and autonomy over administrative control and effectiveness. Most noteworthy was that parents and students had the opportunity to participate in the policy and direction of education. However, since Korean society focused on economic growth, there was a limit to imposing autonomy on schools and colleges, and autonomy became an impeding factor in the improvement of the Korean education system. As a result, the Korean education system gave up the model of nationalism and its education methods, and the education paradigm of liberalism was gradually developed, owing to the emergence of new technology in 1995.

Liberalism, from 1995 to 2015

In Korea's education history, the period from 1995 to 2015 is called the era of liberalism, or education 2.0. It was the time when globalization began, following the fall of the socialist bloc, and, as stated by Jho (2017), "knowledge informatisation such as IT, biotechnology, semiconductor, and IT devices was introduced to the public" (pp. 13-15). Accordingly, highly skilled workers were in demand in the labor market. Korea's existing education policy could not respond to this social change because of the government control of nationalist education. Table 2 below shows the stage of Korea's educational development called education 2.0 (Park, 2016, pp. 2-3).

Table 2

Developmental stages of Korean education, 1995~2015

	1995~2015 Reconstitution of education
Economy	Reconstitution into knowledge-based society
Education	Innovation of governance Academic achievement in the knowledge-based society Autonomous education programs
Focus	Competitiveness for globalization and knowledge-information society
Policy	Lifelong education system Restructuring of higher education Pursuit of education informatization

As Table 2 shows, the changes in Korean society suggest that the era of export-oriented industrialization finished, and that of knowledge informatisation began. This means that

the Korean educational system needed to break away from the standardized curriculum and allow students to engage in more autonomous education programs. On the one hand, standardized curriculum focuses on education suppliers such as teachers and education policy makers, while, on the other, autonomous education programs value education consumers such as students and parents. Such programs concentrate on fostering the highly skilled laborers who are needed in a knowledge-based society and nurturing people who are flexible in response to social changes.

Under these social demands, the Korean Ministry of Education introduced various new school types, such as autonomous private high schools, special purpose high schools, and Meister high schools. Furthermore, the education system of liberalism permitted many high schools and colleges to loosen regulations and to have more freedom, but at the same time assigned them heavier responsibilities. However, most parents requested an equalization of education and a standardized curriculum rather than autonomous education programs. This ultimately caused conflicts between nationalism and liberalism, and between egalitarian education and market-oriented education. This confrontation led to a campaign to block the innovation and evolution of the Korean education system, and some social groups and parents refused to accept diversity, evaluation, and competition. They preferred standardization, even though the society was developing rapidly. In this education trend, the education system of Korea was naturally changed due to the digital era and aimed to foster creative talents with the capability of solving a variety of problems.

Creativity, from 2016 to the present

Many experts in Korea say that talented and creative people will become the new growth engine in the future. The Korean government has been trying to develop education programs to foster creative people and has steadily discussed education reforms to prepare for the era of the Fourth Industrial Revolution since 2016. These education processes are called creative education, or education 3.0 (Park, 2016, p. 5). Creative education requires people who understand artificial intelligence, the Internet of Things, 3D printers, etc., and apply this knowledge to other sectors. To nurture these people, the Korean government instituted the following educational reforms (Park, 2016, pp. 5-8):

1) Capability-oriented education
2) Self-directed learning
3) Nurturing creativity and collaboration

These education reforms need capabilities beyond standardized knowledge. In a world where social networking services are popular, collaboration with others can lead to new creativity and reforms. These capabilities are not obtained through various education programs, but through the self-directed learning of education consumers. Namely, education consumers consider it important to raise questions based on interest and curiosity, discuss them, and answer them with their peers. For example, project-based learning is one of the innovative learning methods required for creative education.

Although the Korean education system offers varied and specialized education programs to schools and colleges based on liberalism, creative learning cannot take place without innovative learning methods. In this respect, the education system of creativity is anticipated to bring about qualitative rather than quantitative changes. However, realistically, the education system of Korea has several problems, such as teaching methods, teacher retraining, and the lack of an evaluation method for fostering creativity and collaboration in students. These problems, rooted in nationalism and liberalism, are expected to gradually be solved because digital technologies such as artificial intelligence, big data, and the Internet of Things will start to dominate society.

Beginning in 2016, education 3.0 highlighted a creative and innovative approach to education that differed from conventional methods. Collaboration with peers, communicative classes, and self-directed learning provide possibilities for fostering creative students with diverse capabilities (Chung, 2017a, pp. 53-72). Moreover, the education system of Korea requires systematical preparation of the educational change for the era of the Fourth Industrial Revolution. Thus, we will examine the characteristics of the Fourth Industrial Revolution in the next section.

Characteristics of the Fourth Industrial Revolution

As mentioned at the 2016 World Economic Forum, the Fourth Industrial Revolution will bring about breakthroughs in the fields of science and technology. It will change the way we live, work and communicate with one another through the Internet of Things, the Internet of Systems, cyber-physical systems, etc. It is also expected to impact all disciplines, industries and economies and reshape government, education and healthcare on a regional and global scale. This implies that the era of the Fourth Industrial Revolution will be fundamentally different from that of the present and will have significantly distinctive characteristics. The Fourth Industrial Revolution (Schwab, 2016) is defined as follows:

A Fourth Industrial Revolution is building on the Third, digital revolution that has been occurring since the middle of the twentieth century. It is characterized by a fusion of technologies that blur the lines between the physical, digital and biological spheres.

As in the definition above, the Fourth Industrial Revolution helps us to create a fusion of the technologies and values of the new world. Schwab (2019) carefully explained the processes of industrial revolution, as shown below:

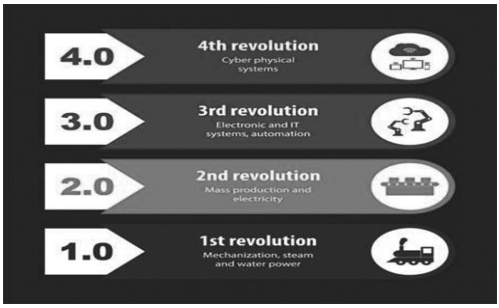

Figure 1. The Fourth Industrial Revolution process

As Figure 1 shows, the First Industrial Revolution occurred between 1760 and 1840, with the advent of the steam locomotive and mechanized textile manufacturing. It was the time when the iron and textile industries, along with the development of the steam engine, played central roles in revolutionizing the means of production. The Second Industrial Revolution took place between 1870 and 1914 and was a period of growth of pre-existing industries and expansion of new ones, such as steel, oil and electricity, in the creation of mass-production systems. The Third Industrial Revolution started in the 1980s and is still underway. It refers to the advancement of technology from analogue electronic and mechanical devices to the currently available digital technology. Finally, the fourth industrial revolution is described as the digital innovation of the current era that is happening with the fusion of the physical, digital and biological spheres, impacting numerous disciplines, industries and economies.

Therefore, the Fourth Industrial Revolution is creating a world in which virtual and physical systems of manufacturing globally cooperate with one another in a flexible way. In addition, it will lead to the emergence of many new businesses in all sectors. Its characteristics (Kim, 2016, pp. 49-51) are as follows:

1) Hyperconnectivity, in which humans and things are connected by an Internet communication network;
2) Hyperintelligence, through which certain patterns can be grasped by analyzing big data through connections.

The characteristics above show a new world that we do not currently experience. Specific characteristics include the ability to connect humans with things, easily grasp certain patterns by big data analysis, and predict human behavior. The technologies and knowledge of the Fourth Industrial Revolution will be available to almost all the population of the globe who can connect, communicate, and interact with one another. Particularly, the use of artificial intelligence and robots is not limited to business but includes health care, education, and even culture. The Internet of Things connects increasingly more devices in both the factory and domestic fields in such a way that almost everybody and everything have become part of a global network. Big Data also collects and processes enormous amounts of data beyond human abilities.

In terms of the educational sector, the Fourth Industrial Revolution will lead to a substantial change in teaching methods, administrative management, lectures, etc. In education policy, it will cause a change in educational laws and institutions and lay the groundwork for creative learning methods. In other words, the education system for the era of the Fourth Industrial Revolution requires new teachers and students, the reform of college admission examinations, and the improvement of the evaluation system. However, the Korean government continues to adhere to the educational system and methods of the past because it still has more interest in the industrial and economic sectors than in education. For this reason, the preparation of the education system for the era of the Fourth Industrial Revolution has been delayed.

Results

From 1960 to the present, most students in Korea have become accustomed to rote learning methods as the unilateral means of transmitting the standardized education under the regime of nationalism. Their creative and autonomous learning was permitted to some extent under the liberalism regime, but nationalistic and authoritarian practices continued to exist. Even today, Korea has not moved beyond its past education methods in terms of education policy and direction and advocates education for the era of the Fourth Industrial Revolution only on the surface.

This educational reality of Koreans can be found in primary and secondary school classrooms where approximately 20 to 30 students learn the same content. Despite the differences in their academic level, learning style and academic achievement, most students take standardized classes, which cause problems such as learning maladjustment, stress, and lack of learning motivation. Furthermore, the government has forced schools to provide students with extracurricular lessons and extend their opening hours so that high school students almost regularly stay for self-study after their classes are over.

In terms of the teaching methods, most teachers give theory-centered lectures and use memorization approaches. These have some limits in meeting the student requirements, motivating students and enabling academic achievement. They also fail to evaluate how well students understand and achieve the learning outcomes. Due to this educational environment, many parents do not trust the public education system and prefer to create fierce competition among students. Therefore, they spend money on private education from elementary to high school. In particular, elementary school students attend private institutions for extra study, and almost all high school students receive private tutoring or lessons even after 10 p.m. This situation has led to low satisfaction of the citizens with the schools compared to other OECD member nations (OECD, 2016), as shown below.

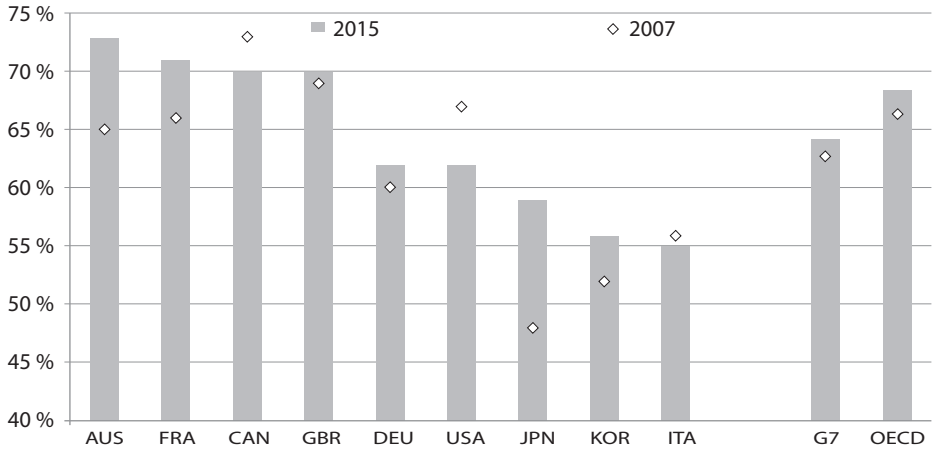

Figure 2. Citizens' satisfaction with the education system and schools, 2007 and 2015

As Figure 2 shows, satisfaction with the education system and schools was approximately 57% in 2015. This reveals the problems of the nationalist and liberal education models, which provide simple, uniform learning contexts. It also presumably makes light of the fact that students have different interests and that the educational system needs to offer classes that respect their opinions and allow them to communicate with one another. In addition, it indicates that the education system of Korea has pursued extremely rigid education programs, school organization and curricula. Teachers and students have had to obey the requirements of the education system for a long time, therefore, students cannot come up with creative ideas, and tend to be ruled by conventional educational methods. This is no longer necessary in developing students' capabilities for the era of the Fourth Industrial Revolution.

Accordingly, the Korean government has begun to solve those problems, strive to change all aspects of the education system and prepare better teaching methods, curricula and evaluation methods. The following education innovations were suggested by the Korean Ministry of Education (2015):

1) Spread of the free semester policy
2) Normalization of public education
3) Reform of local education finance
4) Nurture of work force customized to demands of industry

The education innovations above indicate that the Korean government wants to make changes and encourages teachers and students to implement a new, flexible curriculum and teaching programs. First, the free semester policy aims to change the education culture by reforming the national education system, which means that the policy tries to make a fundamental change into a student-centered learning paradigm (Jung, 2018, pp. 3-4). During the free semester, there are no paper exams and students can exercise their capabilities based on their own talents.

A second education innovation is the normalization of public education. The education system of Korea has been biased toward formality and emphasized quantitative aspects of education. Therefore, many parents have depended on private education because they believe their students will not have opportunities such as advanced learning through public education, which caused the shake-up of public education and the confidence in the system to plummet. Although normalization of public education has not received support from parents, the Korean government has struggled to improve the university entrance system and create an atmosphere that allows students to communicate freely with teachers. The government has also tried to decrease the number of students in a classroom, provide classroom ventilation, cooling and heating, and reconfirm the role of public education.

As the third education innovation, the Korean government plans to reform local education finance. Local government finances, in contrast to those of the central government, are in poor condition, which leads to low effectiveness of education. In terms of educational services, teachers and schools are crucial factors, but investment in students is more

important. Accordingly, the Korean government contributes to improving the quality of education, endeavors to ensure financial stability, and seeks methods of providing better educational service.

Finally, the Korean government promotes educational innovation to foster laborers customized to industry demands. Korea currently confronts a decreasing population and aging society. Therefore, in order to manage sustainable education innovation in this environment, the Korean government is endeavoring to foster highly skilled people because they will help to create the latest technologies and improve the productivity of companies. Besides, the government also aims to reflect social change, education demand and the job market in its education policy. High schools and colleges in particular need to respond to changes in society and the structure of industry and concentrate on activating programs for industrial needs-matched education. Ultimately, what the government targets is to reflect the value of creativity and collaboration through a personalized learning system based on individual talents, experiences and aptitudes.

On the other hand, the Korean education system has undergone much adversity and hardship for more than half a century. Now is the time to change all aspects of the educational system and curriculum. In the era of the Fourth Industrial Revolution, humans will be replaced by robots in many jobs. This poses questions on how Korean education should prepare for the future, which will be different from the present day. In the next section, we will discuss the future of the Korean education system and how to cope with changes for the era of the Fourth Industrial Revolution.

Discussion

The Fourth Industrial Revolution will create a crisis in traditional manufacturing and make 5.1 million jobs disappear in the global employment of major countries. Humanoid robots equipped with artificial intelligence will replace workers in factories and even professionals such as doctors, pharmacists, judges, and lawyers. Nevertheless, technologies such as self-driving cars, biotechnology and 3D printing will allow completely new industries to develop, providing new employment opportunities and improved goods and services.

To keep up with these changes, the Korean government is attempting to create a new educational system and promote the reconstitution of the teaching methods, flexible curricula and education programs.

Table 3 shows changes in educational methods from the past to the present for the personalized learning system. Regarding this, Seel (2012) found the following:

> *Personalized learning systems refer to learning systems that consider the individual differences of learners and tailor the learning experience of learners to their current situation, characteristics, and needs. By adapting courses, learning material, and/or learning activities to learners' individual situation, characteristics, and needs, personalized learning systems aim at increasing learners' progress and outcome, enabling learners to learn with less effort, for example, in terms of time required for learning, and offering higher learner satisfaction*. (pp. 2594-2596)

Table 3
Change in the educational methods for the personalized learning systems

	Mass education system	Personalized learning system
School roles	Nurturing society members Higher school advancement	Students' personal growth Sustainable learning Experience accumulation
Education program	National school curriculum	Personal curriculum
Education course	Teacher-led education	Student-centered education
Evaluation methods	Relative grading Overall evaluation	Absolute grading system Process evaluation
Teachers' roles	Knowledge disseminator Rigid evaluator	Personalized learning system Designer learning assistant

Based on this education method, the Korean government is promoting trials to shift the paradigm from mass education to personalized learning. It is also focusing on student-centered education and personalized learning systems that fit students' individual aptitudes. In other words, a personalized learning system is meant to offer an optimal school curriculum, including students' interests, talents and learning experiences. The Korean government is currently urging many colleges and schools to carry out the personalized learning approach. This learning system means mastery-based, project-based learning programs considering personal aptitudes while sharing knowledge with peers.

Through this personalized learning system, schools will invest more time and money in personal growth, and the education program will enable students to create a personal curriculum. Furthermore, the evaluation methods will change from relative grading system to an absolute grading, and the process of learning will be regarded as important. Above all, many schools and colleges are attempting to change their teaching methods. For example, teachers in many colleges are using the flipped learning approach whereby students study the learning contents online in advance and solve problems through discussion in the classroom (Cha & Kim, 2016). This will help students understand the content more easily.

In addition, there are "student-centered methods – for example, problem-based learning and project-based learning – that allow students to collaborate, work on authentic problems, and engage with the community" (Rotherham & Willingham, 2009, pp. 16-21), and learning methods such as MOOC, TED, or online courses. As a course in which teachers and students can communicate online, MOOC in particular can provide students with high-quality lectures from many good professors. TED talks will help them obtain knowledge and information in various fields, from science to global issues. These types of online platforms have accessibility, autonomy of time and space, and convenience. In online courses, teachers can utilize a tutoring system based on artificial intelligence technologies. This system enables teachers and students to perform personalized learning activities, problem-solving, or teacher-assisted learning. A good example can be found at online universities in Korea, which provide only online courses, and their educational

programs are intentionally designed to develop the student's intellectual ability through multiple disciplines. Consequently, they will work to activate students' creativity and their individual learning in the future.

In this way, the Fourth Industrial Revolution will bring innovation to the school system and accelerate social change as well. In the education system of Korea, personalization will be strengthened by artificial intelligence, which is customized to learning and effectiveness in the future.

Conclusion

It is evident that education significantly influences individuals and society. The education system of Korea has helped to build the foundation of Korean society and lifestyles. Nonetheless, it still requires enormous changes and reforms in comparison with its long history. The education system of Korea analyzed in this research may be classified into three stages from 1960 to the present: nationalism, liberalism, and creativity. The education phase of nationalism refers to the time from 1960 to 1994 when the central government intervened and controlled all education systems and programs. We call this period education 1.0. The education phase of liberalism, or education 2.0, represents the time from 1995 to 2015 when the education system allowed students more autonomy in education programs. Finally, the education phase of creativity, or education 3.0, has been in progress since 2016, entails the pursuit of the Korean government for a personalized learning system that values students' creativity beyond the standardized knowledge system and encourages their abilities to collaborate with others.

These three stages reflect the future directions of the Korean education system for the era of the Fourth Industrial Revolution. A personalized learning system will be a crucial factor in determining the future of Korean education because it strengthens individual interests, talents, aptitudes and experiences, in contrast to mass education. Thus, it can provide creative and innovative education due to a qualitative leap, rather than quantitative expansion. With this education system, Korea is now carrying out a variety of educational programs, such as flipped learning, MOOCs, online courses and TED talks, and developing better teaching methods, curricula and school systems.

References

Cha, D-W., & Kim, H-S. (2016). *Job killer: The Fourth Industrial Revolution, the future of employment after the grand change due to the robot and artificial intelligence*. Hans Media.

Chung, J-Y. (2017a). A study on the design of personal learning system preparing for the era of the Fourth Industrial Revolution. *The Journal of Politics of Education,* 24(3), 53-72. https://www.earticle.net/Article/A314208

Chung, J-Y. (2017b). *The era of the Fourth Industrial Revolution: Prospect and tasks of school education* (Report No: CP2017-02-06(CP). Korean Education Development Institute. https://www.kedi.re.kr/khome/main/research/selectPubForm.do?plNum0=12056

Graf, S., & Kinshuk. (2012). Personalized learning system. In N. M. Seel (Ed.), *Encyclopaedia of the Science of Learning* (pp. 2594-2596). Springer. https://doi.org/10.1007/978-1-4419-1428-6_152

Kim, J-H. (2016). The era of the Fourth Industrial Revolution, strategic countermeasure seeking about changes in the future society. *KISTEP Inside and Insight,* 15, 45-58. https://www.kistep.re.kr/c3/sub3_2.jsp?brdType=R&bbIdx=10502

Jho, H-K. (2017). The changes of future society and educational environment according to the Fourth Industrial Revolution and the tasks of school science education. *Elementary Science Education,* 36(3), 13–15. https://doi.org/10.15267/keses.2017.36.3.286

Jung, W-G. (2018). *Korean middle school students' reflections on the free semester policy: How young adolescents in Korea exercise agency in the context of east Asian education reform*. (Master's thesis). Linköping University.

Korean Ministry of Education. (2015). *A plan for education innovation Implementation and Schedule.* https://www.moe.go.kr/boardCnts/view.do?boardID=294&boardSeq=60283&lev=0&searchType=S&statusYN=W&page=181&s=moe&m=0501&opType=

OECD. (2016). *Citizens' Satisfaction with the Education System and Schools, 2007 and 2015 in Government at a Glance: How Korea Compares*. OECD Publishing.

Paek, S-S. (2017). Search for direction of liberal arts education in the era of the Fourth Industrial Revolution. *Korean Journal of General Education,* 11(3), 13-51. https://www.earticle.net/Article/A304775

Park, S-l. (2016). The Fourth Industrial Revolution and the future of Korean education. In Education Innovation Committee (Eds.), *Education Innovation Symposium* (pp. 1-15). Movement Federation for a Better Society.

Rotherham, A. J., & Willingham, D. (2010). 21st century skills: The challenges ahead. *Educational Leadership,* 67(1), 16-21. https://www.roshdmag.ir/Roshdmag_content/media/image/2012/12/3699_orig.pdf

Schwab, K. (2016). The Fourth Industrial Revolution: What it means, how to respond. World Economic Forum. https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/

Schwab, K. (2019). The Fourth Industrial Revolution: Graph depicting four industrial revolutions in progression from the 18th century to the 21st. *Encyclopaedia Britannica*. https://www.britannica.com/topic/The-Fourth-Industrial-Revolution-2119734

Yoon, J-H. (2014). *Korean education development and prospect of the future education innovation*. Korean Education Development Institute.

Yoon-Cheol Park
Department of English Education
Kyungnam University
Kyungnamdaehak-ro 4, Masanhappo-gu, Changwon city, South Korea
lingular@yahoo.co.kr

Promjene korejskoga obrazovnog sustava i četvrta industrijska revolucija

Sažetak

Obrazovne potrebe trebaju odražavati stvarnost društva, a obrazovne metode ići ukorak s vremenom. Cilj je ovoga istraživanja ispitati obrazovne metode u vremenu četvrte industrijske revolucije u obrazovnom sustavu Koreje. Uzorkom istraživanja obuhvaćen je korejski obrazovni sustav od 1960. do danas, u kontekstu četvrte industrijske revolucije. Za analizu uzorka korišteni su pregled literature i deskriptivni pristup. Rezultati pokazuju da se u obrazovnom sustavu Koreje od 1960. do danas mogu razlikovati tri stadija: prvi je nacionalizam, potaknut od strane vlade, od 1960. do 1994. godine; drugi je liberalizam, koji je naglašavao autonomiju, od 1995. do 2015. i treći, kreativnost tijekom četvrte industrijske revolucije, od 2016. do danas. Rezultati ovoga istraživanja pokazuju da su obrazovni stadiji nacionalizma i liberalizma još uvijek prisutni u Koreji i da obrazovne metode prošlosti, poput masovnoga obrazovanja, nisu prevladane. Četvrta industrijska revolucija zahtijeva stapanje i suradnju unutar obrazovnoga sektora, a očekuje se da personalizirani sustav učenja, koji vrednuje pojedinačne talente, iskustva i sklonosti, bude obrazovna metoda budućnosti korejskoga obrazovanja. Stoga, ovo istraživanje pokazuje da će personalizirani sustav učenja biti odlučujući čimbenik u određivanju obrazovnih metoda Koreje u periodu četvrte industrijske revolucije.

Ključne riječi: *kreativnost; masovno obrazovanje; personalizirani sustav učenja; stapanje; suradnja.*

Uvod

Obrazovanje je važan čimbenik pri određivanju moći zemlje i njezine buduće vrijednosti. Tijekom prošlih 60 godina Južna Koreja je doživjela velike promjene u području obrazovanja koje su utjecale na njezinu politiku, ekonomiju i kulturu, a danas je suočena s još jednom. Naime, obrazovanje u Koreji povezano je s društvenim i ekonomskim razvojem i oduvijek je bilo sukladno politici vladajućih. Iz tog razloga, obrazovni sustav Koreje bio je pod utjecajem socijalnih potreba i obrazovne politike vlade. Čak i danas vlada kontrolira obrazovni sustav, a obrazovne metode koje se

koriste u školama i na fakultetima nisu se u mnogome promijenile. Većina učitelja veću pozornost pridaje zapamćivanju gradiva i nastavu temelji na teoriji. Ovaj pristup nije primjeren društvenim i ekonomskim potrebama za kreativnim talentima u razdoblju digitalne revolucije (Park, 2016; Yoon, 2014; Chung, 2017a, str. 53-72).

Obrazovne metode i programi trebaju se prilagođavati i mijenjati u skladu s razvojem društva. S obzirom na to, korejski obrazovni sustav trenutačno je suočen s novim izazovom u procesu pripreme za četvrtu industrijsku revoluciju „koja mijenja svijet produktima tehnologije, uključujući robotiku, dronove, umjetnu inteligenciju, nanotehnologiju, biotehnologiju, internetske stvari, 3D ispis itd." (Chung, 2017b, str. 15). Četvrta industrijska revolucija, koja zahtijeva kreativnost, ujedinjavanje i suradnju, bit će drugačija od trenutačne okoline, a kreativni pojedinci bit će neophodni u različitim područjima. Postojeći pristup neće riješiti razne probleme obrazovanja: većina učitelja u školama i na fakultetima u Koreji još uvijek poučavaju metodom učenja napamet koja nije učinkovita za poticanje kreativnosti. S tim u vezi, nameće se pitanje: koje bi obrazovne metode i sustave korejska vlada trebala pripremiti?

Odgovor na ovo pitanje nije jednostavan, ali rješenje se može naći u personaliziranom sustavu učenja koji naglašava pojedinačne talente i kreativnost. Obrazovni sustavi i programi koji se trenutačno provode u Koreji potiču razvoj kreativnih učenika, što predstavlja odmak od postojećega obrazovnog sustava i potiče iznalaženje novih obrazovnih metoda koje poštuju i uvažavaju individualne ideje.

Cilj je ovoga istraživanja ispitati obrazovne metode korejskoga obrazovnog sustava u periodu četvrte industrijske revolucije. Pozadina istraživanja zasnovana je na dvije činjenice: prvo, malo je studija koje istražuju korejski obrazovni sustav s makroskopskoga stajališta, kako bi ga pripremile za četvrtu industrijsku revoluciju i drugo, potrebno je propagirati nove obrazovne metode, poput personaliziranoga sustava učenja da bi se zamijenile zastarjele metode, poput zapamćivanja. Proces nije jednostavan, ali ukazuje na promjenu korejskoga obrazovnog sustava.

Metode

Kako bi se ostvario cilj ovoga istraživanja, koristili smo pregled literature i deskriptivni pristup. Pregledom literature ispitali smo prethodne studije obrazovnoga sustava u Koreji od 1960. do danas, a opisnim pristupom usporedili rezultate sakupljenih podataka s obrazovnim sustavom i metodama neophodnim za četvrtu industrijsku revoluciju. Te nam dvije metode omogućuju stjecanje uvida u neophodne promjene korejskoga obrazovanja i pomažu utvrditi obrazovne sustave i metode potrebne za četvrtu industrijsku revoluciju.

U pregledu literature važno je utvrditi promjene i tijek razvoja korejskoga obrazovnog sustava na osnovi prošlih istraživanja. Ovdje koristimo prednost veza između obrazovne politike i društvenoga sektora te između obrazovnoga sustava i njegovih metoda, s makroskopskoga stajališta. Specifično, korejski obrazovni razvoj (Park, 2016) i obrazovnih metoda četvrte industrijske revolucije (Chung, 2017b) pomoći će nam da predvidimo smjerove razvoja korejskoga obrazovnog sustava. Prije svega, personalizirani sustav učenja (Graf i Kinshuk, 2012; Seel, 2012, str. 2594-2596) funkcionirat će kao nova

obrazovna metoda u pripremi za period četvrte industrijske revolucije. Na ovoj osnovi, pregled literature predstavlja temelj za poboljšanje obrazovnoga sustava, kao reakciju na trenutačnu stvarnost u Koreji.

Opisni pristup upotrijebljen je kako bi na osnovi pregleda literature analizirali podatke o razvoju korejskoga obrazovnog sustava. Osim toga, predložene su primjerene alternative relevantne za sadašnji korejski obrazovni sustav, obrazovne metode i programi za doba četvrte industrijske revolucije. Iz tog razloga, ponajprije potrebno je ispitati stvarnost korejskoga obrazovnog sustava i karakteristike četvrte industrijske revolucije, tj. istražiti obrazovni plan korejske vlade i učinkovite obrazovne metode. Projektno učenje i *online* nastava (Paek, 2017, str. 13-51) su popularne metode na korejskim fakultetima, a vlada naglašava njihove dobrobiti za razvoj sposobnosti učenja studenata. Kako bi identificirali ovaj obrazovni kontekst, u idućem poglavlju predstavljamo uzorak promjena korejskoga obrazovnog sustava.

Uzorak

Uzorak ovoga istraživanja ograničen je na korejski obrazovni sustav od 1960. godine do danas i sadržaj četvrte industrijske revolucije zbog toga što je istraživanje namijenjeno kritici korejske obrazovne politike i pregledu novih obrazovnih metoda potrebnih za četvrtu industrijsku revoluciju. Promjene u korejskom obrazovanju mogu se podijeliti u tri stadija (Park, 2016; Yoon, 2014, str. 4-17):

1) Prvi stadij – obrazovna faza od 1960. do 1994. godine, tj. obrazovanje 1.0, potaknuta središnjom vlasti i fokusirana na obrazovanje polukvalificiranih radnika.
2) Drugi stadij – obrazovna faza od 1995. do 2015. godine, tj. obrazovanje 2.0, vodila je sudjelovanju dionika obrazovanja u kurikulu.
3) Treći stadij – obrazovna faza od 2016. godine do danas, tj. obrazovanje 3.0, osmišljena je za obrazovanje kreativnih umova.

Navedeni stadiji promjene obrazovanja obuhvaćaju korejsku obrazovnu povijest od 1960. do danas. Granice između stadija zamjetne su u obrazovnoj filozofiji, politici i ekonomiji. Osim toga, svaki stadij odražava stvarne osobine korejskoga obrazovnog sustava. Ove osobine razvile su se iz socijalne potražnje i pružaju temelj za stvaranje obrazovnoga sustava i metoda potrebnih u pripremi za razdoblje četvrte industrijske revolucije.

Kao još jedan primjer, ovo istraživanje koristi definiciju četvrte industrijske revolucije (Schwab, 2016) i njezinih osobina (Kim, 2016). Četvrta industrijska revolucija povezana je s obrazovnim metodama poput personaliziranoga sustava učenja zbog toga što će digitalne tehnologije promijeniti obrazovne okoline škola i fakulteta. U sljedećem poglavlju predstavljamo analizu tri stadija korejskoga obrazovnog sustava.

Analiza

Nacionalizam, od 1960. do 1994.

Od 1960-ih godina korejsko se društvo uvelike razvilo, a period od 1960. do 1994. godine u njegovoj obrazovnoj povijesti naziva se razdoblje nacionalizma ili obrazovanje

1.0. Tijekom toga perioda mnoge kompanije trebale su jeftinu radnu snagu za masovnu proizvodnju radi razvoja lake i teške industrije. Također, ovaj period može se podijeliti u dvije faze: prva, kvantitativni razvoj obrazovanja od 1960. do 1980. i druga, kvalitativna, promjena od 1981. do 1994. U ova dva perioda naglašeno je obrazovanje nekvalificiranih i polukvalificiranih radnika. Kako bi kultivirala te resurse, korejska vlada intervenirala je u svim obrazovnim sustavima i programima, namećući kontrolu obrazovanja i nacionalizam.

U tim uvjetima najučinkovitija metoda poučavanja bilo je zapamćivanje. To je jednostavna, direktna i pasivna metoda koja je koristila industriji s izraženom potrebom za velikim brojem polukvalificiranih radnika. Štoviše, ovaj obrazovni sustav namijenjen je zadovoljavanju potreba društva za generalizacijom i kvantitativnim porastom masovne proizvodnje. Tablica 1 (Yoon, 2014, str. 4-17) predstavlja razvojni stadij korejskoga obrazovanja zvan obrazovanje 1.0.

Tablica 1.

Kao što je prikazano u Tablici 1, obrazovni sustav i politika usko su povezani s ekonomskim razvojem. U periodu od 1960. do 1980. godine zemlja je trebala veliki broj polukvalificiranih radnika zbog brzoga ekonomskog rasta. Većina radnika u tom periodu imala je završenu srednju školu. Teški rad i iskrenost poticani su obrazovanim politikama poput proširenja srednjoškolskoga obrazovanja, izjednačavanja obrazovanja i strukovnoga obrazovanja (Yoon, 2014, str. 6-17). Osim toga, ponuda obrazovnih usluga bila je ujednačena s potražnjom tržišta rada, a također bile su propagirane obrazovne inovacije kako bi se osposobili visokokvalitetni radnici po nižim cijenama.

S druge strane, obrazovni sustav Koreje od 1981. do 1994. težio je kvalitativnim promjenama poput višega obrazovanja, programa za prekvalificiranje odraslih i informatizacije obrazovanja (Yoon, 2014, str. 11-13). Ovaj period zahtijevao je autonomiju i kvalitativno poboljšanje obrazovanja. U stvari, namjera korejskoga Ministarstva obrazovanja bila je isticanje primjerenosti i autonomije ispred administrativne kontrole i učinkovitosti. Najvrjednije doprinos bila je mogućnost sudjelovanja roditelja i učenika u obrazovnoj politici i njezinom smjeru. Unatoč tome, postojalo je ograničenje autonomije škola i fakulteta zbog fokusa korejskoga društva na ekonomski razvoj, a sama autonomija postala je ometajući faktor u poboljšanju korejskoga obrazovnog sustava, tako da su obrazovni model nacionalizma i njegove metode napušteni i, zbog pojave nove tehnologije 1995. godine, zamijenjeni obrazovnom tehnologijom liberalizma.

Liberalizam, od 1995. do 2015.

Period obrazovne povijesti Koreje od 1995. do 2015. godine naziva se razdoblje liberalizma ili obrazovanje 2.0. Bilo je to vrijeme u kojem je započeo proces globalizacije, nakon pada socijalističkoga bloka, a „informatizacija znanja u obliku informacijske tehnologije, biotehnologije, poluvodiča i IT uređaja predstavljena javnosti" (Jho, 2017, str. 13-15). Prema tome, tržište rada zahtijevalo je visokokvalificirane radnike. Postojeća obrazovna politika Koreje nije bila u stanju odgovoriti na ovu socijalnu promjenu jer je

vlada kontrolirala nacionalno obrazovanje. Tablica 2 u nastavku rada predstavlja razvojni stadij korejskoga obrazovanja - obrazovanje 2.0. (Park, 2016, str. 2-3).

Tablica 2

Kao što je prikazano u Tablici 2, promjene u korejskom društvu sugeriraju da je razdoblje industrijalizacije orijentirane prema izvozu bila završena i da je započela informatizacija znanja. To predstavlja odmak korejskoga obrazovnog sustava od standardiziranoga kurikula, pomak koji učenicima omogućuje angažman na autonomnijim obrazovnim programima. Drugim riječima, standardizirani kurikul usmjeren je na izvršitelje i dobavljače obrazovanja poput učitelja i tvoraca politike, dok autonomni programi obrazovanja prvenstveno uvažavaju korisnike obrazovanja poput učenika i roditelja. Takvi programi fokusiraju se na obrazovanje visokokvalificiranih radnika koji su potrebni društvu zasnovanom na znanju i ljudi koji fleksibilno reagiraju na društvene promjene.

Prema tim zahtjevima društva, korejsko Ministarstvo obrazovanja uvelo je razne nove tipove škola, poput autonomnih privatnih srednjih škola, specijalnih srednjih škola i *Meister* srednjih škola. Osim toga, obrazovni sustav liberalizma dozvoljavao je mnogim srednjim školama i fakultetima opuštenija pravila i više slobode, ali u isto vrijeme davao im je više odgovornosti. Unatoč tome, većina roditelja zahtijevala je izjednačavanje obrazovanja i standardizirani kurikul povrh autonomnih programa obrazovanja, što je u konačnici uzrokovalo sukob između nacionalizma i liberalizma te između egalitarnoga obrazovanja i tržišno-orijentiranoga obrazovanja. Ovaj sukob vodio je kampanji zaustavljanja inovacije i evolucije korejskog obrazovnog sustava: neke društvene skupine i roditelji su odbili prihvatiti raznolikost, evaluaciju i kompeticiju. Spomenuti akteri preferirali su standardizaciju obrazovanja unatoč brzom razvoju društva. U ovom stadiju razvoja obrazovni sustav Koreje spontano se promijenio, zbog digitalnoga doba i nastojao obrazovati kreativne talente sa sposobnošću rješavanja različitih problema.

Kreativnost, od 2016. do danas

Mnogi stručnjaci u Koreji tvrde da će talentirani i kreativni ljudi biti pokretač razvoja u budućnosti. Od 2016. godine korejska vlada pokušavala je dizajnirati obrazovne programe za razvoj kreativnih ljudi i kontinuirano razmatrala obrazovne reforme kako bi se pripremila za četvrtu industrijsku revoluciju. Ovi obrazovni procesi nazivaju se kreativno obrazovanje, tj. obrazovanje 3.0 (Park, 2016, str. 5). Kreativno obrazovanje zahtijeva ljude koji razumiju umjetnu inteligenciju, internetske stvari, 3D ispis itd., one koji mogu primijeniti novo znanje u drugim područjima. Kako bi osposobila te nove ljude, korejska vlada uvela je sljedeće obrazovne reforme (Park, 2016, str. 5-8):

1) Obrazovanje orijentirano na sposobnost
2) Samostalno učenje
3) Njegovanje kreativnosti i suradnje

Navedene obrazovne reforme usmjerene su na razvoj sposobnosti prije nego standardiziranom znanju. U svijetu popularnosti društvenih mreža, suradnja s drugima

može voditi novoj kreativnosti i reformama. Ove sposobnosti ne stječu se raznim obrazovnim programima, već samostalnim učenju učenika. Naime, učenici smatraju važnim postavljati pitanja zasnovana na interesu i znatiželji, raspravljati i odgovoriti na njih sa svojim vršnjacima. Na primjer, projektno učenje jedna je od novih metoda učenja koja zahtijeva kreativno obrazovanje.

Iako korejski obrazovni sustav školama i fakultetima nudi razne i specijalizirane obrazovne programe utemeljene na liberalizmu, kreativno učenje ne može se događati bez inovativnih metoda učenja. U tom pogledu očekuje se da će obrazovni sustav kreativnosti donijeti kvalitativne prije nego kvantitativne promjene. Ipak, realistično gledano, korejski obrazovni sustav ima nekoliko problema, poput metoda poučavanja, prekvalifikacija učitelja i nedostatka metoda evaluacije koje podržavaju razvoj kreativnosti i suradnje učenika. Ti problemi ukorijenjeni su u nacionalizmu i liberalizmu, ali očekuje se da će postupno biti riješeni jer će digitalne tehnologije poput umjetne inteligencije, *Big Data* tehnologije i internetske stvari početi dominirati društvom.

Započevši 2016. godine, obrazovanje 3.0 naglasilo je kreativni i inovativni pristup obrazovanju koji se razlikuje od konvencionalnih metoda. Suradnja s vršnjacima, komunikacijska nastava i samostalno učenje osiguravaju mogućnosti obrazovanja kreativnih učenika s raznolikim sposobnostima (Chung, 2017a, str. 53-72). Štoviše, korejski obrazovni sustav zahtijeva sistematičnu pripremu obrazovne promjene za razdoblje četvrte industrijske revolucije, stoga ćemo u sljedećem poglavlju ispitati njezine značajke.

Značajke četvrte industrijske revolucije

Industrijska revolucija dovest će do otkrića u području znanosti i tehnologije; promijenit će način na koji živimo, radimo i međusobno komuniciramo putem internetskih stvari, sustava interneta, kibernetičko-fizičkih sustava itd. Također se očekuje njezin utjecaj na sve discipline, industriju i ekonomiju te preoblikovanje vlasti, obrazovanja i zdravstvene skrbi, na regionalnom i globalnom planu. Iz navedenoga slijedi da će se razdoblje četvrte industrijske revolucije u osnovi razlikovati od sadašnjosti i imati značajno različite karakteristike, a njezinu definiciju (Schwab, 2016) navodimo u nastavku:

Četvrta industrijska revolucija nadogradnja je treće, digitalne revolucije koja se događa od sredine dvadesetoga stoljeća. Stapanje tehnologija koje brišu granice između fizičkih, digitalnih i bioloških sfera osobina je četvrte industrijske revolucije.

Kao što je navedeno u prethodnoj definiciji, četvrta industrijska revolucija pomaže nam ujediniti tehnologije i vrijednosti novoga svijeta. Schwab (2019) pažljivo objašnjava procese industrijske revolucije, kao što je prikazano:

Slika 1.

Kako je prikazano na Slici 1, prva industrijska revolucija dogodila se između 1760. i 1840. godine s pojavom parne lokomotive i mehanizirane proizvodnje tekstila. Bilo je to vrijeme kada su tekstilna i metalna industrija, uz razvoj parnoga stroja, igrale središnju ulogu u revoluciji sredstava proizvodnje. Druga industrijska revolucija obuhvaća period

između 1870. i 1914. godine, a podrazumijeva razvoj već postojećih industrija i rast novih, poput industrije čelika, nafte i električne energije, u stvaranju sustava masovne proizvodnje. Treća industrijska revolucija počela je 1980-ih i još uvijek je u tijeku. Odnosi se na napredak tehnologije od analognih elektroničkih i mehaničkih uređaja do trenutačno dostupne digitalne tehnologije. Konačno, četvrta industrijska revolucija opisana je kao digitalna inovacija trenutačnoga razdoblja koje se događa stapanjem fizičke, digitalne i biološke sfere, s utjecajem na brojne discipline, industrije i ekonomije.

Sukladno tome, četvrta industrijska revolucija stvara svijet u kojem virtualni i fizički sustavi proizvodnje fleksibilno surađuju na globalnoj razini. Osim toga, vodit će do pojave mnogih novih poslova u svim sektorima. Njezine karakteristike (Kim, 2016, str. 49-51) su sljedeće:

1) hiperkonektivnost - ljudi i stvari povezani su internetskom komunikacijskom mrežom
2) hiperinteligencija – razumijevanje određenih uzoraka analizom velike količine podataka (*Big Data* tehnologija) putem veza.

Navedene osobine predstavljaju novi svijet koji je uglavnom još uvijek vizija. Specifične karakteristike uključuju sposobnost povezivanja ljudi sa stvarima, lako shvaćanje određenih uzoraka upotrebom *Big Data* tehnologije i predviđanje ljudskoga ponašanja. Tehnologije i znanje četvrte industrijske revolucije bit će dostupni gotovo cjelokupnoj zemaljskoj populaciji koja se može povezati, komunicirati i biti u međusobnoj interakciji. Napose, upotreba umjetne inteligencije i robota nije ograničena na poslovni svijet, već uključuje i zdravstvo, obrazovanje čak i kulturu. Internetske stvari povezuje sve više uređaja u tvornicama i u kućanstvima tako da su gotovo svi postali dio globalne mreže. Osim toga, upotrebom *Big Data* tehnologije sakupljaju se i obrađuju ogromne količine podataka koje nadilaze ljudske sposobnosti.

Kada govorimo o obrazovnom sektoru, četvrta industrijska revolucija vodit će značajnoj promjeni metoda poučavanja, administrativne uprave, predavanja itd. U obrazovnoj politici uzrokovat će promjenu obrazovnih zakona i institucija te postaviti temelje za kreativne metode učenja. Drugim riječima, obrazovni sustav četvrte industrijske revolucije zahtijeva nove učitelje i učenike, reformu prijemnih ispita na fakultetima i poboljšanje sustava evaluacije. Unatoč tome, korejske vlasti nastavljaju slijediti obrazovne sustave i metode prošlosti jer još uvijek imaju više interesa u industrijskom i ekonomskom sektoru nego u sektoru obrazovanja. Iz tog razloga priprema obrazovnoga sustava za razdoblje četvrte industrijske revolucije kasni.

Rezultati

Od 1960. do danas većina korejskih učenika naviknula se na metode učenja napamet kao jedino sredstvo prenošenja znanja u standardnom obrazovanju režima nacionalizma. Njihovo kreativno i autonomno učenje bilo je dozvoljeno do neke mjere u režimu liberalizma, ali nacionalističke i autoritarne prakse i dalje su postojale. Čak i danas, Koreja ostaje unutar granica obrazovnih metoda prošlosti u smislu obrazovne politike i smjera te samo prividno zagovara obrazovanje za eru četvrte industrijske revolucije.

Obrazovna stvarnost Korejaca odražava se u učionicama osnovnih i srednjih škola, gdje približno 20 do 30 učenika uči isti sadržaj. Unatoč razlikama u njihovim akademskim razinama, stilu učenja i postignuću, većina učenika sluša standardiziranu nastavu, što uzrokuje problem poput slabe prilagodbe učenju, stresa i nedostatka motivacije za učenje. Nadalje, vlada je primorala škole da učenicima osiguraju izvannastavne aktivnosti i produže vrijeme rada, tako da srednjoškolci gotovo svakodnevno ostaju u školi nakon redovne nastave zbog samostalnoga učenja.

S obzirom na metode poučavanja, većina učitelja ima predavački pristup usredotočen na teoriju i zapamćivanje. Ovi su pristupi manjkavi u zadovoljavanju učeničkih zahtjeva, motiviranju učenika i omogućivanju akademskoga postignuća. Također su neuspješni u evaluaciji kvalitete učeničkoga razumijevanja i ishoda učenja. Zbog ove obrazovne okoline, mnogi roditelji ne vjeruju u javni obrazovni sustav i radije stvaraju jaku kompeticiju među učenicima. Stoga troše novac na privatno obrazovanje od osnovne do srednje škole: osnovnoškolci pohađaju privatne ustanove radi dodatnoga obrazovanja, a gotovo svi srednjoškolci imaju nastavu ili privatnu poduku do čak poslije 22 sata. Ova situacija uzrokovala je nisko zadovoljstva građana školama u usporedbi s drugim nacijama članicama OECD-a (OECD, 2016), kako je prikazano u nastavku.

Slika 2.

Kako je prikazano na Slici 2, zadovoljstvo s obrazovnim sustavom i školama bilo je približno 57 % 2015. godine. Ova činjenica otkriva problem nacionalističkoga i liberalnoga obrazovnog modela koji podrazumijevaju jednostavne, jednoobrazne kontekste učenja. Također osvjetljava činjenicu da učenici imaju različite interese i da obrazovni sustav treba osigurati nastavu koja poštuje njihova mišljenja i dozvoljava međusobnu komunikaciju. Osim toga, navedena činjenica zadovoljstva obrazovnim sustavom pokazuje kako je isti imao ekstremno rigidne obrazovne programe, školsku organizaciju i kurikule. Učitelji i učenici morali su dugo vremena ispunjavati zahtjeve obrazovnoga sustava, stoga učenici ne mogu smišljati kreativne ideje jer su ograničeni konvencionalnim obrazovnim metodama. To više nije potrebno u razvoju učeničkih sposobnosti za doba četvrte industrijske revolucije.

Prema tome, korejska vlada počela je rješavati navedene probleme, nastojeći promijeniti sve aspekte obrazovnoga sustava i pripremiti bolje metode poučavanja, kurikule i metode evaluacije. Korejsko Ministarstvo obrazovanja (2015) predložilo je sljedeće obrazovne inovacije:

1) širenje politike slobodnoga semestra
2) normalizacija javnoga obrazovanja
3) reforma financiranja lokalnoga obrazovanja
4) odgoj radne snage prema zahtjevima industrije.

Navedene inovacije u obrazovanju ukazuju na želju korejske vlade za promjenama kojima bi se potaknulo učitelje i učenike na primjenu novoga, fleksibilnog kurikula i programa poučavanja. Prvo, politikom slobodnoga semestra nastoji se promijeniti

kultura obrazovanja reformom nacionalnoga obrazovnog sustava, što znači da u se osnovi pokušava promijeniti postojeća paradigma učenja u onu koja je usredotočena na učenika (Jung, 2018, str. 3-4). Tijekom slobodnoga semestra nema ispita, a studenti mogu iskazivati svoje sposobnosti na osnovi vlastitih talenata.

Druga obrazovna inovacija je normalizacija javnoga obrazovanja. Naime, obrazovni sustav Koreje naglašavao je formalnosti i kvalitativne aspekte obrazovanja, zbog čega su mnogi roditelji ovisili o privatnom obrazovanju jer nisu vjerovali u mogućnost javnoga obrazovanja da njihovoj djeci pruži prilike naprednoga učenja. Zbog toga je došlo do poremećaja i smanjenja povjerenja u javno obrazovanje. Iako roditelji nisu podržavali normalizaciju javnoga obrazovanja, korejska vlada nastojala je popraviti sustav upisa na sveučilište i stvoriti atmosferu u kojoj učenici slobodno komuniciraju s učiteljima. Vlada je također pokušala smanjiti broj učenika u razredu, osigurati ventilaciju učionica, rashlađivanje i grijanje te reafirmirati ulogu javnoga obrazovanja.

Kao treću obrazovnu inovaciju, korejska vlada planira reformirati financiranje lokalnoga obrazovanja. Za razliku od onih središnje vlasti, financije lokalne vlasti su u lošem stanju, što vodi niskoj učinkovitosti obrazovanja. U smislu obrazovnih usluga, učitelji i škole ključni su čimbenici, ali ulaganje u učenike je važnije. Prema tome, vlada nastoji osigurati financijsku stabilnost i poboljšati kvalitetu obrazovanja.

Naposljetku, korejska vlada promovira obrazovnu inovaciju s ciljem obrazovanja radnika prilagođenih zahtjevima industrije. Koreja se trenutačno suočava sa smanjivanjem populacije i starenjem društva. Radi održivosti obrazovnih inovacija, korejska vlada nastoji obrazovati visokokvalificirane pojedince koji će pomoći u stvaranju najnovijih tehnologija i doprinijeti produktivnosti kompanija. Svojom obrazovnom politikom vlada također nastoji obuhvatiti socijalne promjene, zadovoljiti obrazovne zahtjeve i one tržišta poslova. Srednje škole i posebno fakulteti trebaju pratiti promjene u strukturi društva i industrije aktivacijom programa obrazovanja koji će ispunjavati potrebe industrije. Krajnji cilj vlade je razvoj kreativnosti i suradnje kroz personalizirani sustav učenja zasnovan na talentima, iskustvima i sklonostima.

S druge strane, tijekom više od pola stoljeća korejski obrazovni sustav suočio se s mnogim teškoćama i izazovima, a sada je vrijeme za promjenu kurikula i ostalih aspekata obrazovnoga sustava. U razdoblju četvrte industrijske revolucije ljude će zamijeniti roboti na mnogim poslovima. Nameće se pitanje načina na koji bi se korejski obrazovni sustav trebao pripremiti za budućnost, nesumnjivo drugačiju od sadašnjosti. U sljedećem poglavlju raspravljat ćemo o budućnosti korejskoga obrazovnog sustava i načinu na koji se nositi s promjenama za razdoblje četvrte industrijske revolucije.

Rasprava

Četvrta industrijska revolucija stvorit će krizu u tradicionalnoj proizvodnji i u globalnom zapošljavanju velikih zemalja uzrokovati nestanak 5,1 milijuna radnih mjesta. Opremljeni umjetnom inteligencijom, humanoidni roboti zamijenit će radnike u tvornicama čak i stručnjake poput liječnika, farmaceuta, sudaca i odvjetnika. Unatoč tome, tehnologije

poput samovozećih automobila, biotehnologije i 3D ispisa omogućit će razvoj potpuno novih industrija i osigurati nove prilike zapošljavanja te poboljšane robe i usluga.

Kako bi išla ukorak s promjenama, korejska vlada nastoji stvoriti novi obrazovni sustav i promovirati preoblikovanje metoda poučavanja, fleksiblne kurikule i obrazovne programe.

Tablica 3.

Tablica 3 pokazuje promjene obrazovanih metoda, od prošlih prema sadašnjim metodama personaliziranoga sustava učenja:

> *„personalizirani sustavi učenja odnose se na sustave učenja koji razmatraju individualne razlike među učenicima i kroje iskustva učenja primjerena trenutnoj situaciji, osobinama i potrebama učenika. Prilagodbom nastave, materijala učenja i/ili aktivnosti učenja specifičnoj situaciji, osobinama i potrebama učenika, personalizirani sustavi učenja nastoje povećati učenički napredak i ishode, omogućiti učenicima da uče s manje napora, na primjer, u smislu vremena potrebnog za učenje, i osigurati veće zadovoljstvo učenika*" (Seel, 2012, str. 2594-2596).

Na osnovi ove obrazovne metode, korejska vlada nastoji uključiti promjene paradigme masovnoga obrazovanja u personalizirane sustave učenja koji odgovaraju učeničkim individualnim sklonostima. Drugim riječima, personalizirani sustav učenja namijenjen je pružanju optimalnoga školskog kurikula, uključujući učeničke interese, talente i iskustva učenja. Korejska vlada trenutačno potiče mnoge fakultete i škole na primjenu personaliziranih sustava učenja zbog toga što podrazumijevaju programe učenja zasnovane na vještini i projektu te razmatraju osobne sklonosti učenika pri dijeljenju znanja s vršnjacima.

Personalizirani sustav učenja omogućit će školama da ulože više vremena i novca u osobni razvoj, a njegovi obrazovni programi kreiranje osobnoga kurikula učenicima. Osim toga, promijenit će se metode evaluacije zbog toga što će relativni sustav ocjenjivanja zamijeniti apsolutni, a proces učenja smatrat će se važnim. Povrh svega, mnoge škole i fakulteti pokušavaju promijeniti metode poučavanja. Na primjer, profesori na mnogim fakultetima koriste pristup obrnute učionice u kojem studenti uče unaprijed, *online*, a problem rješavaju raspravom u predavaonici (Cha i Kim, 2016), što olakšava razumijevanje sadržaja.

Osim toga, postoje „metode usredotočene na učenike – na primjer, problemsko učenje i projektno učenje – koje omogućuju učenicima suradnju, rad na autentičnim problemima i angažman u zajednici" (Rotherham i Willingham, 2009, str. 16-21), i metode učenja poput MOOC, TED ili *online* nastave. Kao sustav u kojemu učitelji i učenici komuniciraju *online*, MOOC pruža studentima mogućnost praćenja visokokvalitetnih predavanja mnogih profesora, a TED predavanja pomoći će im u stjecanju znanja i informacija u brojnim područjima, od znanosti do globalnih pitanja. Te su vrste *online* platformi dostupne, pružaju autonomiju vremena i prostora i udobnost. U *online* nastavi učitelji mogu koristiti sustav poduke zasnovan na tehnologiji umjetne inteligencije. Ovaj sustav omogućuje učiteljima i učenicima izvođenje personaliziranih aktivnosti učenja, učenje rješavanjem

problema ili učiteljski potpomognuto učenje. Dobar primjer su *online* sveučilišta u Koreji na kojima se odvija samo *online* nastava, a njihovi su obrazovni programi dizajnirani s ciljem razvoja intelektualne sposobnosti studenata kroz višestruke discipline, što će posljedično aktivirati kreativnost i individualno učenje studenata u budućnosti.

Četvrta industrijska revolucija na ovakav način uvest će inovacije i ubrzati društvene promjene. U obrazovnom sustavu Koreje umjetna inteligencija nadogradit će personalizaciju u skladu s učenjem i učinkovitosti u budućnosti.

Zaključak

Očito je da obrazovanje ima značajan utjecaj na pojedince i društvo. Korejski obrazovni sustav pomogao je u izgradnji temelja korejskoga društva i životnih stilova. Ipak, još uvijek su potrebne značajne promjene i reforme u odnosu na njezinu dugu povijest. Korejski obrazovni sustav, analiziran u ovom istraživanju, može se klasificirati u tri stadija od 1960. godine do danas: nacionalizam, liberalizam i kreativnost. Obrazovna faza nacionalizma odnosi se na period između 1960. do 1994., kada je središnja vlast intervenirala i kontrolirala sve obrazovne sustave i programe. Ovaj period nazivamo obrazovanje 1.0. Obrazovna faza liberalizma ili obrazovanje 2.0, predstavlja period između 1995. i 2015., u kojem je obrazovni sustav dao učenicima više autonomije u obrazovnim programima. Konačno, od 2016. godine u tijeku je obrazovna faza kreativnosti ili obrazovanje 3.0, unutar koje korejska vlast razvija personalizirani sustav učenja koji vrednuje učeničku kreativnost više od standardiziranoga sustava znanja te potiče njihove sposobnosti suradnje.

Ova tri stadija odražavaju smjerove budućega korejskog obrazovanog sustava za razdoblje četvrte industrijske revolucije. Personalizirani sustav učenja bit će ključni čimbenik u određivanju budućnosti korejskoga obrazovanja jer jača individualne interese, talente, stavove i iskustva, za razliku od masovnoga obrazovanja. Stoga, može osigurati kreativno i inovativno obrazovanje prije nego kvantitativno proširenje, zbog kvalitativnog rasta. Unutar takvog obrazovnog sustava Koreja danas primjenjuje raznolike obrazovne programe, poput obrnutoga učenja (flipped learning), MOOC, *online* nastave i TED konferencija te razvija bolje metode poučavanja, kurikule i školske sustave.