

116-0002

ISSN 2435-3345

2-20-7 Arakawa Arakawaku Tokyo Japan

# Robotics & AI Ethics

2020 5(1)

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J-INSTITUTE

Publication state: Japan  
ISSN: 2435-3345

Publisher: J-INSTITUTE  
Website: <http://www.j-institute.jp>

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<http://dx.doi.org/10.22471/ai.2020.5.1.01>

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## AI-Based Migrant Crisis Management

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### Abstract

*Northeast Asian Countries of Korea, China, Japan has not experienced massive migrant crisis before and also not been noticed from migrant issue debating. But the informatization and globalization slowly but gradually drives Northeastern Countries into migrant issues. These countries are coping with various types of migrants, e.g. North Korean Defectors and marriage immigrants. And Korea experienced Syria-Yemen migrant crisis at 2018 which is detonated from European refugee crisis, and that induces forecasting of various forms of migrant issues would be unfold at onshore Northeastern Asian Countries. The characteristics of these kinds of migrant crisis are its large size and unpredictable time line. Current AI cognitive computing technology could be applied to analyze the nature of migrant crisis and to support effective policy making that corresponds migrant crisis.*

**[Keywords]** *Migrant Crisis, Northeastern Countries, Artificial Intelligence(AI), Cognitive Computing, Migrant Policy*

### 1. Global Issues but Local Experiences: Northeastern Countries' Experience of Migrant Crisis

The modern type of migrant crisis are outbreak after the end of World War II. Refugees from all over troubled parts of the world are trying to percolate into European countries, the place where economically prosperous and public safety secured. But during the cold war and its consequences make reinforced ground & maritime border control and the number of refugees were not much at then.

During the European countries' "Cold War" era of 1970s to 1980s, Asian countries are facing "Hot War" and another type of migrant crisis. After the end of Vietnam War at 1975 and some people tried to escape from communized Indochina Peninsula via sea route. These people are called Vietnamese Boat People.

Lots of Boat People who successfully flee from his or her country resettled in developed countries, such as United States, Canada, Australia, Italy, France, West Germany, and United Kingdom. But Northeastern countries and Hong Kong also give humanitarian aid and accepted wholeheartedly some considerable number of Vietnamese Boat People. From April 1975 when the Capital city of Saigon was fallen to 1992, Republic of Korea accepted about 3,000 into transit camp as a shelter and about 600 are resettled. China accepted about 260,000 and most of them as 250,000 resettled. Hong Kong accepted over 200,000 and among them about 1,500 settled. Japan accepted about 18,000 and 8,600 resettled[1].

There are major international convention which deals with migrant issues such as Schengen Agree-

ment entered into at 1985 and Dublin Regulation effectuated at 1997 in EU region. Northeastern countries does not have meaningful treaties that regulate migrant issues among their regional relationships by this time, meanwhile Migrant crisis are still under way in this region.

As the world is Globalized, Migrant crisis is also influenced by Globalization. It draws wide attention of all over the world due to the rapid development of ICT and media. Also geographical boundaries are easily overcome with advanced transportation system that enabled easy travel of migrants.

Current European migrant crisis affected Northeastern countries in unexpected and differentiated ways. In most cases and previous era, migrants appeared in the realm of geographically nearby territory. That's the reason why migrant crisis is regarded as a directly connected to European Countries in most cases, as the European migrant crisis from 2015 detonated at Middle East areas and spread to Mediterranean and southeast Europe. But some amount of migrants tried to resettle to Northeastern Countries. This case shows that it is needed to understand current situation of Northeast Asian Countries' perspective of migrant crisis.

## 2. The Cause of Occurrence and Current Situation of Migrant in Northeast Asian Countries

Adopting some concepts of Economics would be much helpful to understand migrant crisis as a global issue. International Financial Markets are categorized into two parts, which are onshore markets and offshore markets. This categorizing standard could be applied to the migrant issues of Northeast Asian countries.

Onshore issues of migrant is related to flowing migrants into nearby region and accepting process of them. In here migrant means the refugee who appeared inside Northeastern Countries and issues connected with inside the region. Onshore migrant issues also includes that resettlement of some amount of migrants from outside Northeastern Countries.

On the other hand, offshore issues of migrant is connected with migrants who are spilled out from Northeastern Countries. This issues could be differentiated the one case of migrants who are moving from Northeast Countries from the other case of migrant who make use of Northeast Countries as a travel route to final destination. This analysis could be shown as following <Figure 1>.

**Figure 1.** Types of migrant crisis issues in Northeastern Countries

	Category	Beginning	Resettle
Migrant crisis	Onshore	Inside	Inside
		Outside	Inside
	Offshore	Inside	Outside
		Outside	Outside(via inside)

One of the most important issues in Northeast Asian countries' migrant crisis is onshore migrant crisis that is related with North Korean Defector. Legal terminology of North Korean Defector is "residents escaping from North Korea". The term means persons who have their residence, lineal ascendants and descendants, spouses, workplaces, etc. in the area north of the Military Demarcation Line (hereinafter referred to as "North Korea"), and who have not acquired any foreign nationality after escaping from North Korea[2].

North Korean Defectors are constantly growing from 2005, and the numbers are 1,500 each year after 2012. Total Number of North Korean Defectors who entered South Korea is 32,476 people[3][4].

These North Korean Defectors issues affect major Northeastern countries of Korea, China, and Japan. Most of North Korean Defectors try to resettle at South Korea via China, and also some moves to Japan. China functions both the first destination and halfway point to final resettlement place, so lots of North Korea Defectors are scattered and resettled over parts of China for actual circumstances. Japan is not much preferred for they need seaway to move and there is North Korea friendly social organization of Chongryon exists[5].

On the other way, there was a social issues that migrants from outside Northeast Asian Countries entered into South Korea and tried to get the Refugee status. At the year of 2018, about 500 numbers of people from Syria and Yemen entered Cheju Island via Malaysia and demanded refugee status citizenship. This was dealt as a kind of special and unique case for following two reasons.

One reason is that migrants make use of non-visa waiver program. It is needed to get a visa to enter Korean territory in most cases. But Cheju island has exceptional rules that almost all the people from various countries could visit 30 days without visa, for promote tourist detention. Migrants from Yemen wisely used this program and they could come into Korean territory and demanded refugee status screening legitimately.

The other reason is that large numbered, disorganized and hetero-cultured migrants flooded into Korea in a very short time interval. These migrants started their journey from Middle East Country that is far from Northeast Asia. Also most of them are Muslim and Korean people do not know their religion much and that caused hardness of harmonize. The migrants from Yemen tends to stop by Malaysia and came to Korea as their final destination. Ministry of Justice accepted 362 people out of 481 as a humanitarian status holder which means a person who is given permission to stay on humanitarian grounds at 17 Oct 2018[6]. This does not means the people are refugee but guarantees free to move and stay inside Korean territory. Till 2018 people from Yemen who got the humanitarian status are 1,446 overall[7][8].

Issues of migrants with offshore is mere administrative decision in most cases and most migrant issues are focused to onshore side. In Northeast Asian region, migrant issues are not only each nation's matter but also matters of functional linkage among the nations. For understand this, it is needed to analyze the causes and solutions for approaching migrant issues of Northeastern Countries.

### **3. The cause of occurrence of migrant crisis in Northeastern Countries**

Issues of migrant crisis could be dissolved both the cause of appear and approach to solution. This issues exists between each Nations' level and Global level influence.

When the refugee issue is approached at the individual national level, there is a problem that it is difficult to draw the cooperation of neighboring countries to refugees who attempt to settle on the basis of a region rather than a country. On the other hand, approaching the refugee problem at the global level also has the problem that the solution to the refugee problem stops at idealism, and it is difficult to expect the role of individual countries to perform as a practical agent. So migrant crisis could be dealt with loose alliance among Nations based on common grounds of geographical closeness.

The most important thing to analyze in relation to the occurrence of refugees is the cause of the refugees, and the part that is currently a problem that is related to political factors, such as the refugee problem caused by opposition to the socialist system in China and the problem caused by North Korean Defectors. The other is that the main cause of economic factors is marriage or employment immigrants <Figure 2>.

**Figure 2.** Key points of migrant crisis issues in Northeastern Countries.

	Category	Type	Example
Migrant crisis	Cause of occurrence	Political	Different political orientation
		Economic	Marriage or employment

Based on this classification, the analysis of refugee problems in the region will be conducted in two aspects: the cause of the occurrence and the solution. First, the causes of refugee problems in the region can be understood as following two factors of political and economic problems converged to the economy. Refugees in Northeast Asia are mainly politically responsible. First of all, people who have fled from China and wandering abroad have suggested various causes such as religious freedom and human rights. However, the essence is the opposition of China's socialist system, and the difference in political orientation is analyzed as the cause of the refugee problem. This aspect can be understood to be the same for the North Korean Defector. However, as more and more people escaped from North Korea in search of economically favorable conditions, there was an ambiguous division between political and economic factors in the cause of refugee problems.

On the other hand, migrants from marriage or employment are using economic factors as the main driving force. This can be recognized as a refugee, considering the situation of being threatened with basic life. But on the other hand, considering that they are trying to emigrate to get better living conditions, they would not be recognized as a refugee in a strict sense. So there lies some difficult points. With this, various discussions related to multicultural issues are being developed in Korean society in relation to such marriage or employment migrants.

#### 4. Solution Plans as Policy Suggestions through Applying AI Cognitive Computing into Migrant Issues in Northeastern Countries

Solutions to these refugee problems can be approached at the short, medium and long term. First of all, among the important considerations regarding the solution to the refugee problem, it is related to how to accept refugees and how to support them in the short term, and analyze the causes of refugee outbreaks and find conditions of their return in the med term. In the long term, it is a matter of how to integrate these into the existing local and world-class citizens' communities. The above classification is as following <Figure 3>.

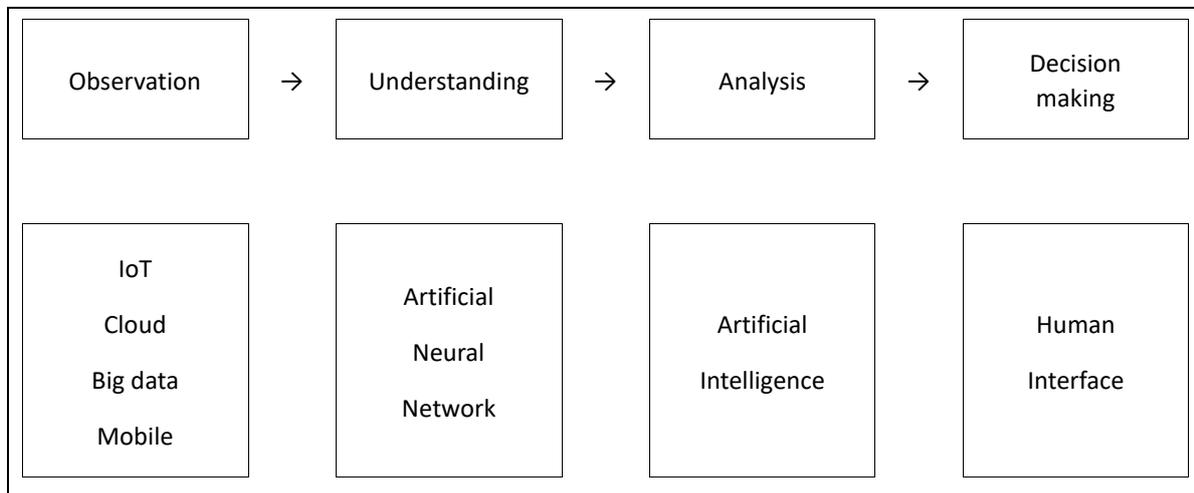
**Figure 3.** Solution plans for migrant crisis issues in Northeastern Countries.

	Category	Type	Example
Migrant crisis	Solution plan	Short term	Support and embrace
		Mid term	Analysis of conditions for returning of migrants
		Long term	Social and global integration

However, in order to derive such a solution, cognitive computing technology for utilizing artificial intelligence technology is required. Particularly, cognitive computing technology is required because it

is most suitable for making policy decisions related to refugees. The core of artificial intelligence technology is to provide various solutions by utilizing intelligence technology. The operation method of cognitive computing is usually presented as following <Figure 4>.

**Figure 4.** Basic mechanism of cognitive computing.



Applying this cognitive computing method to the solution to the refugee problem is as follows.

First, the following points can be considered in the observation phase. The refugee issue is characterized by, above all, the individual human being is the subject of activity. These characteristics can be said to provide basic data for cognitive computing in the following ways. First, it has characteristics related to IoT and Mobile in that it can measure individual data by using various connected devices that each individual has and shares information. In addition, it has the characteristics of Big data in that a large amount of information that is produced by involving a large number of people and stakeholders in relation to this information. And in order to effectively share information which is produced from various sources, it has the characteristics related to the distributed management of information based on the cloud.

Second, the following points can be considered in the understanding stage. The refugee problem are ultimately developed into forms of complex and diverse human activities, but in a macroscopic view it tends to move in the converged form of a certain pattern. Therefore, at this stage, it is necessary to understand the potentially shared purpose through effective collection of diverse and vast data of each refugee as an individual in microscopic terms. This functional linkage analysis has characteristics associated with the formation of neural networks based on artificial intelligence.

Third, in the analysis phase, a series of processes is needed to synthesize and forecast each of these results in a macroscopic view. The artificial intelligence requested in this process does not need to be a universally used Strong artificial intelligence, but a weak artificial intelligence targeting specific conditions and situations of refugee problems will suffice. The technical field that can be noted in connection with the use of such artificial intelligence requires the development and use of programs that can solve specific cognitive challenges through machine learning.

Fourth, in the decision-making stage, insight can be obtained based on the result of the comprehensive analysis of the collected data, and used as a basis for policy decision and execution. Prediction and response through the active use of AI technology will help countries in Northeast Asia, who have not experienced large-scale refugee problems directly, to establish policy responses to future refugee

problems.

This study corresponds to the basic theory that suggests the use of AI cognitive computing to understand refugee problems. In the refugee issue, a study on the specific application method of AI cognitive computing and the algorithm of cognitive computing and policy proposals through it will be made through subsequent studies.

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## 6. Contribution

### 6.1. Authors contribution

	Initial name	Contribution
Lead Author	KHS	-Set of concepts <input checked="" type="checkbox"/> -Design <input checked="" type="checkbox"/> -Getting results <input checked="" type="checkbox"/> -Analysis <input checked="" type="checkbox"/> -Make a significant contribution to collection <input checked="" type="checkbox"/> -Final approval of the paper <input checked="" type="checkbox"/> -Corresponding <input checked="" type="checkbox"/> -Play a decisive role in modification <input checked="" type="checkbox"/>
Corresponding Author*	PGY	-Significant contributions to concepts, designs, practices, analysis and interpretation of data <input checked="" type="checkbox"/> -Participants in Drafting and Revising Papers <input checked="" type="checkbox"/> -Someone who can explain all aspects of the paper <input checked="" type="checkbox"/>

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Publication state: Japan  
ISSN: 2435-3345

Publisher: J-INSTITUTE  
Website: <http://www.j-institute.jp>

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<http://dx.doi.org/10.22471/ai.2020.5.1.08>

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## Concern-Based Acceptance Model for Character Education and Some Implications to AI Ethics

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### Abstract

*Character Education is, more importantly, requested as the times develop. Students' intellectual abilities are also critical, but the character skills they need to have as a person are also necessary. For teachers who will teach students in school, character education is not just a matter of interest. Teachers must have the capacity to improve students' personality abilities. This study analyzes the level of interest in character education for pre-service teachers in Korea and tries to give some implications to AI Ethics.*

**[Keywords]** *Character Education, Concern-Based Adoption Model(CBAM), Teacher Education, Pre-service Teacher, AI Ethics*

## 1. Introduction

### 1.1. Research background and necessity

Character education is an activity that teaches and learns 'for life' so that human beings have the characteristics and competencies necessary to live as human beings as the reason and purpose of education[1]. Recently, character education is an important education that many countries pay attention to. The fact that countries around the world pay attention to character education also means that the problems they face are similar. Although countries around the world have experienced the convenience and abundance that dominated the overall values of society through policies focused on economic growth, mental exhaustion is deepening. And the problem of mental exhaustion harms society as a whole. Based on school violence, dating violence, and anti-humanity events, there are anti-human problems caused by mental exhaustion. Korea is also facing a social problem. To improve these problems, a systematic approach to character education is being attempted in Korea.

According to Article 6 of the Character Education Promotion Act[2] and Article 3 of the Enforcement Decree of the Character Education Promotion Act[3], 17 metropolitan and provincial offices have established and operated the specific plan to implement character education. To make specific research character education, there are so many cases[1][2][3][4][5][6][7][8][9][10][11][12][13]. As a convergence approach to character education, two cases are typical such as Yoon YD[14] and Park YJ[15]. And there is a case to measure the effectiveness of character education[16].

For character education to be successful, both formal and content elements must be provided. For example, the national curriculum, subjects, class hours, textbooks, students, teachers, etc. are examples of formal elements. Besides, students' attitudes, content level of textbooks, teacher's expertise in subject knowledge, teacher's aggressiveness in class, and relationships with students can be classified into informal factors. When education is said to be successful, various assessments of this element

should be made and improved. For character education to be successful, these factors must be made and evaluated from various perspectives.

This study focuses on teachers, especially pre-teachers, among several factors to ensure successful education. The purpose of this study is to identify the preliminary factors for successful character education at the school site by looking at the level of interest of pre-service teachers in character education. This study's attempt to analyze the level of pre-service teacher's interest in character education is meaningful. This is because there are no studies related to the level of interest of teachers in studies related to character education. It is very meaningful to check the level of interest in the pre-service teacher's character education for the successful implementation of character education, and it is essential in planning character education policy, planning data, and training.

Therefore, the purpose of this study is to obtain implications for teacher education by more systematically grasping the level of interest in character education of pre-service teachers using the interest-based acceptance model(CBAM). The specific research goals for this are as follows.

First, what is the distribution of interest level regarding preliminary teachers' character education?

Second, is there a difference in the level of interest in character education according to the gender of the pre-service teacher?

## **1.2. Definition of terms**

Stages of Concern: It refers to the degree of cognitive state(feeling, awareness) of the contents of education when teachers conduct classes. In other words, the degree that reflects the defining characteristics of the teacher's perception, motivation, frustration, and satisfaction is referred to as the level of interest as a whole meaning. Hall et al. divided the level of interest in given information into perceptual interest, informational interest, personal interest, operational interest, considerable interest, collaborative interest, and reinforced interest level.

## **1.3. Research limitations**

The limitations of the study are as follows.

First, factors that determine the effectiveness of character education can be considered in addition to the teacher variables, such as the school curriculum, educational environment, the interests and supports of school administrators and parents, and the level of student development. However, because this study deals only with variables related to teachers, it is necessary to limit the interpretation of the analysis results.

Second, the selection of preliminary teachers for survey analysis is limited to Seoul National University of Education's third-grade students. It is difficult to say that these are the most appropriate targets for the population. Therefore, there is a limit to generalization in interpreting survey results.

## **2. Theoretical Background**

### **2.1. Concern-based adoption model(CBAM)**

This study intends to apply the CBAM(Interest-Based Acceptance Model) to explore the current level of interest in character education of pre-service teachers in a more scientific way. CBAM described the process of promoting change innovation in school organizations and education sites[17]. Through many studies, it has been verified that it is a model that can adequately explain the process of introducing new education contents, methods, or technologies. According to Hall and Hord[17], who organized CBAM, he argued that change is not a temporary event, but a process and that individuals within the organization must change. Besides, they said that the basic unit of change is school and classroom.

Therefore, to actively apply character education in the field of education, it is crucial how the teacher who leads the classroom class, which is the unit of change, feels about these changes. The concept in this regard is 'concerns.' Interest refers to feelings and perceptions of the process of innovation and change and has a progressively changing developmental character[17]. According to Hall and Hord [17][18], attention can be divided into 'unrelated,' 'self,' 'task,' and 'impact' levels. These are specified as following 7 steps: 'awareness', 'informational', 'personal', 'management', 'consequence', 'collaboration', 'refocusing'.

The 'perception' stage means that you are less interested in school innovation, and the 'information' stage means that you know the volume. Teachers at the "individual" level want to know their role concerning the implementation of school innovation. At the "operation" level, they are focused on the process and work in which change is used. In the "result" stage, they are interested in how the school innovation will affect students directly related to them, while in the "cooperation" stage, they are interested in coordinating and coordinating with other teachers. Lastly, in the 'refocus' phase, he is interested in changing the direction of innovation into a more developmental way or exploring innovative measures in innovation.

This level of interest can evolve into non-users, inexperienced users, experienced users and renewing users as changes are facilitated. Non-users show a higher interest in level 0(perceptive), beginner users in level 3(operational), seasoned users in level 5(cooperative), and reproductive users in level 6(enhanced). Non-users are divided into positive non-users and distrustful non-users. Positive non-users have a high level of interest in level 5(cooperation), and non-trusted non-users are level 6(enhanced). CBAM[17] is highly utilized in that it systematically diagnoses the level of importance of teachers when new educational contents and methods are introduced to the educational field and invention education.

## 2.2. Analysis of previous research

In some previous studies, there was an attempt to analyze the teacher's level of interest in 'creativity and character education,' although not strictly character education. In this regard, in Korea, In-Sook Lee, Mi-Jeong Park, and Jeong-Hyeon Chae[19] analyzed the level of interest in 'creative and character education' among 187 home-school teachers. The level of interest of home and teachers in 'creative and character education' was the highest in the information level(85.51), followed by the personal level(85.18), operational level(81.88), perceptual level(82.15), and reinforcement level(68.80), cooperative level(61.97), and result level(59.76).

Joong-Keun Kim and Seung-Jae Kim[20] diagnosed the current state of the physical education curriculum creative and character education by finding out the level of interest in innovative and character education in the 2009 revised curriculum of middle and high school physical education teachers nationwide. As a result of the responses of 290 physical education teachers, first, the physical education teachers' interest in creativity and character education in the 2009 revised curriculum showed low-interest levels in perception, information, and personal level.

Hollingshead[21] surveyed the level of interest in character education programs for 197 elementary school teachers, 48 middle school teachers, and 57 high school teachers. In general, the level of cooperation was higher than that of other levels. There was no statistical difference in school grade differences.

## 3. Research Method

### 3.1. Research subject

This study was conducted for 3rd-grade pre-service teachers at S Education University. S Education University Department of Ethics and Physical Education conducted an online survey of 57 students in

the third grade. A total of 38 students responded to the survey: 28 female students and ten male students.

### **3.2. Measuring tools**

In order to analyze the pre-service teacher's interest level in character education, Concern-Based Adoption Model (CBAM) developed by Hall and Hord [17][18] was modified and used according to the context of character education. For example, in the original text, revise, such as 'I am interested in what results this transformational innovation will bring to students' and 'I am interested in what character education will bring to students.' It was used after review by engineering experts. This tool consists of 35 questions. Respondents were asked to respond from 0 to 7 points according to their degree of agreement with each issue. In this study, the reliability of the internal consistency of the tools was Cronbach's  $\alpha = 0.852$ .

### **3.3. Research procedure and analysis method**

To find out the level of interest in the character education of pre-service teachers, an offline questionnaire was conducted for two weeks for students who took the practice of elementary moral education at S Education University. The collected data were analyzed statistically using MS Excel and PASW 23.0. The scores were calculated using the scoring system CBAM proposed by Hall and Hord [17][18] to calculate the original score and relative intensity. The original score was calculated by summing up the response scores of similar questions, and the relative strength was calculated by finding the corresponding value in the calculation table proposed by Hall and Hord [17][18]. According to the original score by stage. The result of the relative intensity derived in this way was expressed as a CBAM profile. The level of interest profile was determined as non-user, novice user, seasoned user, and reproductive user according to the form proposed by Hall and Hord [17][18]. In addition, a T-test was conducted to verify differences according to gender, and the statistical significance level was verified at .05 level.

## **4. Results**

### **4.1. Pre-teacher's level of interest in character education**

The results of calculating percentile scores reflecting the mean, standard deviation, and relative intensity of the original score for each interest level using the scoring table proposed by Hall and Hord [17][18]. Looking at the original scores of the level of interest in the pre-service teacher's character education, the 4th level (result) was the highest with 29.39, and the 3rd level (operating) was the lowest with 19.66. Converting this to the relative intensity of Hall and Hord [17][18], the 0st level (perception) was the highest at 93%, followed by the 1st level (information) at 82% and the 2nd level (individual) at 77%. Stage 3 (operational) was the lowest with 40%. Looking at the relative intensity of the level of interest in the pre-service teacher's character education, the level 0 (perceptual) is the highest, and the pattern gradually decreases as the scale goes to the levels 1, 2, 3, and 4. At the 5th stage (cooperative), the level of interest rose slightly. This is very similar to the form of harmful nutrients among several typical interest stage profiles presented by Hall and Hord [17][18]. This group has a high level of interest in stages 0 to 2, less interest as it goes to stages 3 and 4, and a slightly higher level of interest in stage 5 (cooperative) and stage 6 (enhanced). This group represents doubts and potential resistance to change and innovation.

### **4.2. Differences in level of interest in character education by gender**

There was no statistically significant difference in interest level by gender at each stage. However, gender differences were found in the level of operational interest ( $t = -2.23$ ,  $P < .05$ ). Besides, compared with the types proposed by Hall and Hord [17][18], typical pattern has not been shown.

It is worth noting that there are differences in the level of interest in character education, depending on the gender of the pre-service teacher. If you consider the reality that the phenomenon of elementary school is gradually increasing in the field of school, it is necessary to find the gender ratio of the teacher for the successful implementation of character education. Of course, this requires detailed investigation and analysis. Still, it can be said that the difference in interest level according to the gender of the pre-service teachers shown in this study is a meaningful discovery.

## 5. Conclusion and Suggestions

This study systematically analyzes the interest in character education for pre-service teachers, focusing on CBAM proposed by Hall and Hord[17], to derive an intervention strategy in teacher education to contribute to on-site access to character education. As a result of the study, the level of relative interest in pre-service teachers' character education was the highest at 93%(perceptual) and the lowest at 40%(operating). Hall and Hord[17], who proposed CBAM, said that it is a general phenomenon that high scores appear in the 0th stage(perception), and it is not necessary to understand these results. When looking at the questionnaire score calculation table of the interest level, in the case of the 0 level(perceptual), the relative strength score is converted to 90 or more even if the total score of the original score is only 14 or more out of 35. Therefore, if you look at the exception of step 0(perceptual), you can see that step 1(informative) is quite high, at 84%. In other words, it can be seen that the comparative companies want to know more about character education. Next, the second level(personal) was also high at 82%, which means that as a pre-service teacher, they want to know more about their role in character education[17]. In addition, when looking at the relative level of interest in the character education of the preliminary teacher, the patterns of the level of the 0~(perceptive) to the 4th level(result) are continuously lowered, and the 5th(cooperative), 6th level(enhanced) Shows a rather high degree of interest. This group represents doubts and potential resistance to change and innovation. These results indicate that pre-service teachers have not yet reached the level of mature interest, but they are positively aware of character education. In other words, the results of this study show that prospective teachers are not positive users and do not have enough information on character education[17].

This study is significant in that it is systematically grasping the interest in the character education of pre-service teachers, focusing on CBAM, at present, where expectations for the effectiveness of character education are rising. Based on the limitations of this study, the following follow-up studies can be proposed. First, this study was conducted only for preliminary teachers of specific teacher training institutions, and the proportion of gender was not uniform in the research. It is necessary to follow up with other pre-service teachers to see if the results are the same. In addition, if you consider various context variables such as character education related lecture experiences, and use qualitative interview methods, you will be able to develop a more in-depth understanding.

Second, it is suggested to analyze the level of interest in character education for current teachers. Through this, it is expected that it will be possible to obtain policy implications for improving the effectiveness of training strategies and character education for current teachers. At this time, it would also be meaningful to compare the differences in the interests of pre-service teachers and current teachers.

Third, the level of interest of teachers can change and develop with time[17], so that the level of interest in preliminary teacher's character education can be analyzed through time series analysis to look at changes.

This study analyzed the interests of pre-service teachers for character education. In order to further organize this, it is necessary to propose a method of how it can be implemented at the AI level. This study has limitations in suggesting the concrete method. First of all, it is necessary to elaborate on factors related to students, teachers, and the environment in order to give an approximate direction.

Next, we need to establish the moral capabilities we want to nurture through character education. If this premise is fulfilled, personal education and moral education related to AI will be possible in the future.

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## 7. Contribution

### 7.1. Authors contribution

	Initial name	Contribution
Lead Author	KBJ	<ul style="list-style-type: none"> <li>-Set of concepts <input checked="" type="checkbox"/></li> <li>-Design <input checked="" type="checkbox"/></li> <li>-Getting results <input checked="" type="checkbox"/></li> <li>-Analysis <input checked="" type="checkbox"/></li> <li>-Make a significant contribution to collection <input checked="" type="checkbox"/></li> <li>-Final approval of the paper <input checked="" type="checkbox"/></li> <li>-Corresponding <input checked="" type="checkbox"/></li> <li>-Play a decisive role in modification <input checked="" type="checkbox"/></li> </ul>
Corresponding Author*	PGY	<ul style="list-style-type: none"> <li>-Significant contributions to concepts, designs, practices, analysis and interpretation of data <input checked="" type="checkbox"/></li> <li>-Participants in Drafting and Revising Papers <input checked="" type="checkbox"/></li> <li>-Someone who can explain all aspects of the paper <input checked="" type="checkbox"/></li> </ul>

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Publication state: Japan  
ISSN: 2435-3345

Publisher: J-INSTITUTE  
Website: <http://www.j-institute.jp>

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<http://dx.doi.org/10.22471/ai.2020.5.1.16>

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## COVID-19 and Some Implications to AI

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### Abstract

*After the plague based on the Corona virus began in Wuhan, China in late 2019, it has been on a global pandemic. Usually, disease occurs spontaneously in order to minimize entropy in natural order. However, Corona-virus Disease 2019(COVID-19) is said to have been artificially made in a laboratory in China to prepare for future diseases. Responsibility theory is raised by this speculation. In particular, sever influenza fluctuates at similar times in the United States, continuing a mutually responsible battle. In the process of overcoming the disease, criticism of the role and status of World Health Organization(WHO) and monopoly of information in a specific country also appeared. Japan suffers from the problems of hosting the 2020 Summer Olympics. In addition, COVID-19 has various issues. In order to overcome this plague, which has become a problem around the world, high citizenship, medical mission, and politician leadership are needed. In Korea, various cutting-edge big data are being used to identify the definitive. These techniques should not be limited to just finding infected people. Variety of politics, economy, society, culture and education affected by plague. Therefore it is necessary to apply Artificial Intelligence(AI) technology.*

**[Keywords]** *Coronavirus Disease 2019(COVID-19), Global Pandemic, Entropy, World Health Organization(WHO), Artificial Intelligence(AI)*

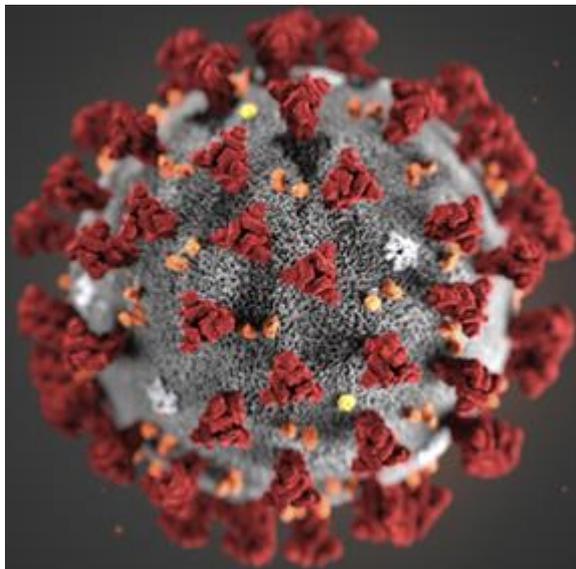
## 1. Introduction

Human being is a part of the earth such as plants and animals etc. This thought has been well known in oriental countries under the philosophy like Confucianism, Buddhism, Daoism etc. But very exceptionally in western side there is this tradition. It is Aldo Leopold that suggest the very idea[1][2]. This study aims to inquiry and suggest the way using this idea.

Coronavirus Disease 2019(COVID-19) is a type of pneumonia-causing virus that occurred in Wuhan, China's Hubei province, in December 2019[3]. Corona viruses are a group of related viruses that cause diseases in mammals and birds. In humans, coronaviruses cause respiratory tract infections that can be mild, such as some cases of the common cold(among other possible causes, predominantly rhinoviruses), and others that can be lethal, such as SARS, MERS, and COVID-19. Here, COVID-19 stands for that "CO" refers to 2019 when the outbreak of the new coronavirus was first reported, "VI" means virus, "Disease" and "19." In response, the South Korean government announced on February 12 that it would name the Korean name for the "new coronavirus infection" as "Coronavirus infection-19," or "Corona 19." [3].

Symptoms in other species vary: in chickens, they cause an upper respiratory tract disease, while in cows and pigs they cause diarrhea. There are yet to be vaccines or antiviral drugs to prevent or treat human coronavirus infections[4]. Paradoxically the external shape of COVID-19 is very beautiful with Crown <Figure 1>.

**Figure 1.** External shape of COVID-19[4].



The condition was initially called "weather pneumonia," but it was called the "new coronavirus infection." The reason is that the WHO omitted the name "Wuhan" in 2020 following its recommendation not to use names that include people's names and occupation forces. Then the WHO announced on February 11, 2020 that it had named the new coronavirus infection 'COVID-19'[5].

This study intends to suggest a medical alternative through a non-medical approach, rather than a traditional method for providing medical analysis and alternatives related to COVID-19. In some countries, the name of the virus is called Wuhan Corona, rather than COVID-19. It is also pointed out that the most prestigious WHO on this issue remains a donation, which tends to overlook many countries. Each country views the issue from a different perspective and misunderstands it. In Japan, the hosting of the 2020 Summer Olympics also tends to pursue national interests rather than the risk of viral infections. As such, COVID-19 is not understood as a simple medical disease, but is recognized very complexly. Therefore, this study presupposes Earth as a living thing, analyzes current issues, and proposes alternatives. In addition, this study provides a basic direction on how to apply artificial intelligence technology.

## **2. Corona-19 Occurrence and the Characteristics of Pathogen**

Corona-19 is a respiratory infection caused by a new type of coronavirus. The pathogen of the disease is contagious when the nasal passages(sweeping droplets) of an infected person penetrate into the mucous membranes of the respiratory or eye, nose, and mouth.

Here, the nasal infection is usually known to have a travel distance of 2 meters, with viruses and bacteria mixed with tiny droplets of saliva and other saliva when an infected person coughs and

sneezes. In the case of eyes, patients' saliva, etc., can get into the eyes directly or rub their eyes with hands contaminated with the virus, which can be transmitted through the eyes[3].

However, the health authorities said they have not yet confirmed the possibility of air transmission. Its main symptoms are severe fever or coughing on the back of the respiratory system, and sore throat. If infected, respiratory symptoms such as fever(37.5 degrees) and coughing or difficulty breathing after going through incubation period of 2 to 14 days(estimated), and pneumonia appear to be the main symptoms, but there are also rare cases of an inanimate infection. In the beginning, the cause was known only as an unknown respiratory epidemic, but the pathogen was confirmed when the World Health Organization said on Jan. 9, 2020 that the cause of the pneumonia was "the new strain coronavirus." World experts and funds set priority for Corona-19 research, 12 February 2020[3].

Since then, with the spread of infection continuing, the WHO has declared an "international public health emergency" on Jan. 30. On top of that, the Chinese government officially confirmed the possibility of human-to-human infection, saying, "15 medical workers in Wuhan were confirmed on January 21, 2020." The infection of medical staff is known as a key indicator of human-to-human transmission[3].

COVID-19 was initially thought to be a local problem in certain countries. So the WHO, who oversees the disease, recognized the problem of a particular country as an individual country's problem, and the loss was too great to realize that it was not just a local problem. Now, beyond the scope of the medical damage of COVID-19's disease itself, it has become a critical issue that affects the entire global life.

### **3. Each Country's Efforts to Overcome**

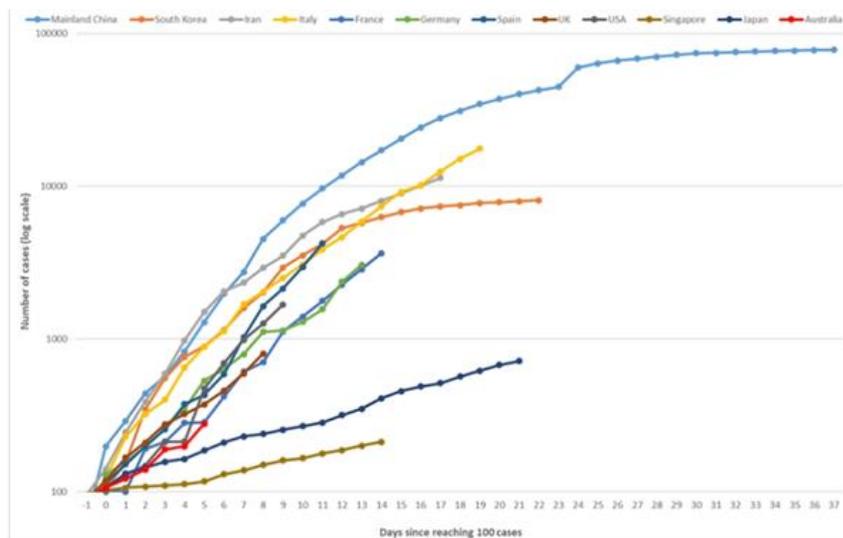
While COVID-19 is spreading not only to China but to the rest of the world, countries around the world including the United States, Japan, Australia, New Zealand and Singapore have taken super-strong measures. First of all, the US declared a public health emergency on 31<sup>st</sup> January regarding COVID-19 and said it would temporarily ban foreign nationals who have been to China for the past two weeks starting at 5 pm on 2<sup>nd</sup> February(based on the Eastern time of US). It will also be mandatory to quarantine US citizens returning from Hubei Province, which includes the epicenter of the COVID-19, for 14 days at a separate facility.

In Japan, from midnight on 1<sup>st</sup> Feb, all foreigners who have stayed in China's Hubei province within the last 14 days are denied entry in principle. Australia also banned foreign travelers from China from entering the country on 1<sup>st</sup> Feb, and said it will implement self-price rates for Australian citizens returning from China for 14 days. New Zealand has yet to confirm the COVID-19 virus, but it has decided to restrict the entry of foreigners from China as well as foreigners via China from 3<sup>rd</sup> Feb. The Philippines, the first country outside of China to suffer from a virus infection, initially refused only to admit travelers from Hubei province, but expanded it to refuse visas if they left or stayed across China. Singapore has also decided to ban foreigners who have visited mainland China for the past 14 days from 1<sup>st</sup> Feb.

In the case of Korea, population movements from foreign countries were not restricted. However, the early stages of the nationwide lull caused pandemic throughout the country due to the

gathering and evangelism of certain religious people. In response, the Korean government conducted treatment through four stages of classification according to the severity of the patient's symptoms. In addition, various methods, such as "drive through" which is originally car driving shopping system for time save, were used to effectively conduct diagnosis, and training centers of large corporations were used to secure hospital beds. However, in Singapore and Japan, the increase of COVID-19 is significantly different from that of other countries. The world is distrustful of Japan. It is suspected to be passively screening for the Olympic Games opening. Singapore is showing the same trend also. But It is analyzed that the reason is systematic administrative management as a small urban state <Figure 2>.

**Figure 2.** Each countries' COVID-19 trends[6].



## 4. Non-Medical Responses to Plague's Reason

### 4.1. The political conspiracy theory of the United States and China

While each country's medical response to the Corona-19 infection from China is being closely watched, there are non-medical conspiracy theories surrounding it. In particular, the "Virus U.S. Military Manufacturing" raised by the Russian broadcaster and the "Chinese Laboratory Leakings" raised by a US lawmaker are considered the most provocative conspiracies. According to the Russian news agency, the trendy new Corona in China has spread in the wake of a public conspiracy between the U.S. military and pharmaceutical companies. They claim that the U.S. military's secret biological and chemical weapons team manufactured and spread the virus and induced pharmaceutical companies to make money through it. The broadcaster added that the U.S. intelligence agency was behind the scenario. In contrast, Senator Tom Cotton (Republican Party, Arkansas) raised suspicions that the virus might have leaked from China's biochemical warfare program. It was suggested based on the fact that there was a facility in Wuhan, the origin of the virus. There is China's only bio-safety fourth-class "super-lab" studying the world's deadliest germs in the country, Cotton said at a recent congressional hearing, adding that 14 out of 40 early infected

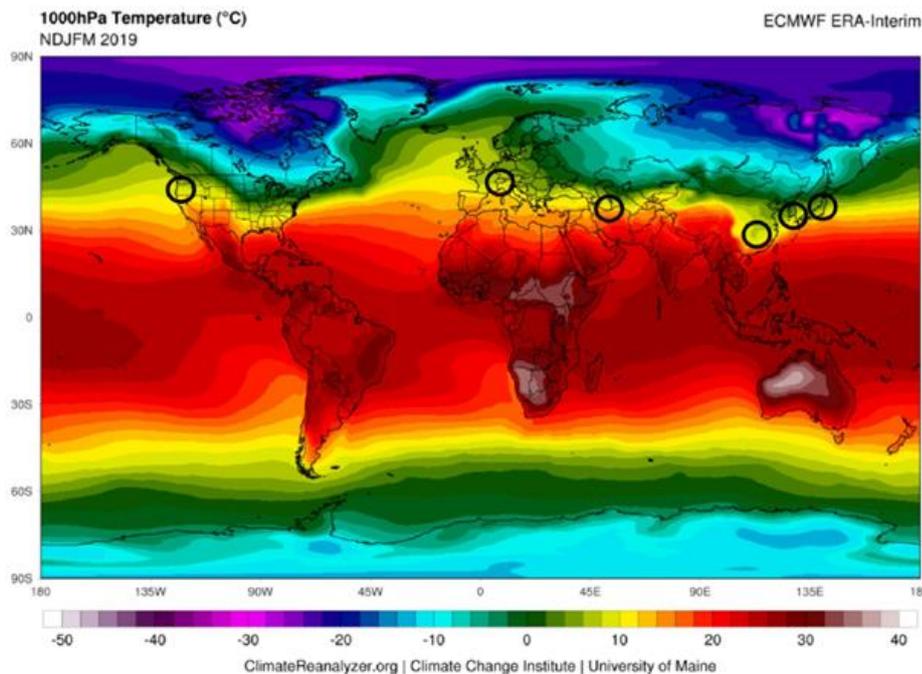
people are not related to the market for the virus-originated Wuhan Fisheries[7]. However, various opinions like these are not limited to specific countries and media, and as strong as COVID-19's plague spreads.

## 4.2. Relevance of climate, food and disease

A new coronavirus from Wuhan, China, is prevalent around the world, with the exception of India, a country with a population of 1.35 billion. Hong Yi-sook, "Why is Corona19 low in India. As of February 11, 163 confirmed cases(including 135 cruise ship patients) were confirmed in Japan, 49 in Hong Kong, 45 in Singapore, 33 in Thailand and 28 in Korea, including more than 42,000 confirmed cases in China, the origin of the new Corona. However, India, which borders China and has a much larger population, has only three confirmed people. How few confirmed people in India are compared to other countries. The confirmed figures for other continents include 15 from Australia, 14 from Germany, 13 from the United States, 11 from France, eight from Britain and seven from Canada. Still, there have been only three confirmed cases in India, which is an Asian country and is notorious for poor sanitation, and with high population density. The world is groaning for new corona, but India is the only exception[8].

But still there are many doubts as to how COVID-19 occurred. According to the latest research, it was spread by climate and weather independently of which route it was propagated to. According to the research, in the <Figure 3>, the color gradient indicates 1000hPa temperatures in degrees Celsius. Black circles represent countries with significant community transmission(> 6 deaths as of 3/5/3019). The <Figure 3> was based on the Image from Climate Reanalyzer[9], Climate Change Institute, University of Maine, USA.

**Figure 3.** World temperature map November 2018-March 2019[10].



Most experts believe the reason is the difference between germs and viruses. The biggest

difference between germs and viruses is that germs are large and viruses are small. Germs also divide themselves, and viruses cannot divide themselves. The more decisive difference is that germs like hot and humid environments, whereas viruses prefer cold, dry climates. This is why viral diseases are prevalent in the winter months. While new Corona is in full bloom, 1.3 billion Indians are infected with only three. India is a hot and humid environment because it spans subtropical regions. Therefore, germs breed well, but it is not an environment where viruses can spread. High-temperature, humid environment, vegetarian food culture and strong antipsychotics seem to be a big help in preventing the viral epidemic[11].

Thus, it can be seen that the disease has a very high correlation with climate, weather and food culture. The data presented so far makes this estimation possible without assuming that the efforts of each country are consistent.

### **4.3. The problem of monopolizing samples, research ethics**

Amid the spread of Corona-19 around the world, a paper on the new Corona was published in the New England Journal of Medicine(NEJM) on 29<sup>th</sup> Jan. NEJM has the highest "Impact Factor" in medical journals with 70.67 points, indicating the influence of the paper. According to the paper, researchers at the China Center for Disease Control and Prevention(CDC) in China observed 10 patients with the new Corona and found that the average incubation period was 5.2 days. The team also investigated 425 first-time infections and revealed for the first time the results of its "reproduction index" analysis, in which one infected person infects 2.2 others on average. The worldwide response to this paper was great. The data were early data related to the new Corona, which was published in the top medical journal, and the credibility of the book was huge. Local and foreign media outlets rushed to cite the contents of the paper. However, there was one thing to pay attention to in this paper[12].

The researchers say that there have already been human-to-human infections through close contact since mid-December last year, and such infections have spread over the next month. This is the formalization of "human-to-human infection," which was believed to have existed since the early days of the outbreak. This is why some analysts say that the Chinese CDC did not publicize the case to the public even though it knew of the human-to-human infection, or reported it to other related ministries, but it could have been ignored. The research team also wrote in the paper that the Chinese CDC started an emergency investigation on January 3 and raised the level of emergency response to the second level on January 6, but some point out that the public was not aware of this. Some critics say that the research manager of the paper did not give the host to others while monopolizing the host of the virus because of his desire to publish the paper to the NEJM, or that he did not send a diagnostic kit to Wuhan to diagnose the new coronavirus and sent it belatedly after submitting the paper to the NEJM[13].

Research into human disease is a very important issue. However, there is a question of moral value conflict as to whether to cure the disease that is currently being raised or whether to study it first. Researchers in China's National Laboratory, located in Wuhan, which is believed to be the epicenter of COVID-19, have published an excellent paper, but cannot fully escape this concern.

## **5. Conclusion: Preparing for Future**

The whole earth is caught in the wind of COVID-19. It is doubtful when to leave. The question of whether this plague first occurred must be clearly resolved. If this is artificially designed to prevent new diseases, it is a serious research ethical task. It is a violation of the principle of proportionality to artificially create a disease that has these serious consequences.

Therefore, this study suggests several alternatives while urging the improvement of the basic view of the plague of the future. First, we must overcome the arrogance that this earth is only human. Human beings have the same status as everything that exists on this planet. It's worse than a gorilla when it comes to strength, and less than a cheetah when it comes to running. Only intelligence is relatively high. It is nonsense that humans can control everything just because they have such talents. However, if human beings are creatures, and like carnivorous animals, they must be carnivored to be able to live, they must have infinite gratitude for the object. COVID-19 became so prevalent because humans lacked a true sense of gratitude.

Second, the concept of the community of living units should be activated. Currently, in Korea, certain religious facilities are amazing in size worldwide. In the case of Roman Catholicism or Buddhism, this concept of community of living units is established. However, Protestantism is too eager for evangelism, so it is engaged in religious activities beyond living units. This can damage the entire community, not just yourself, when a plague like COVID-19 comes. You need to be grateful for yourself and the small community.

Third, it is necessary to make social distance a daily life. I think that the ripple power in the West is more closely related to life culture than the East. In the East, the short and small kiss and the Hug culture are rare, but in the West it is a life. Social distance should be perceived as a treatment, even during the plague.

Fourth, worldwide big data should be built on the causes, implementation status, and actions of the plague. Currently, the WHO sees too many individual countries' attention due to financial problems, and this limitation must be overcome. WHO should use artificial intelligence to actively prepare for future plague.

Fifth, the problem of reverse discrimination must be solved. When a plague such as COVID-19, which has a high social interest, occurs, patients who have a fatal disease for other reasons in solving this problem may be marginalized. This reverse discrimination should be minimized.

Sixth, various efforts should be made to block the will. There are many testimonies to the outbreak of COVID-19. WHO and the International Court of Justice(ICJ) should work together on this matter to try to stop the will of the crime. It is necessary to establish an international prosecutor system to investigate these issues.

Mankind is the greatest, not the most favored by God. Mankind is the most imperfect, and it is the consideration of the most divine. The starting point of resolving human plague should start with self-reflection. Disease is also a signal from God. We should try not to be hostile to the disease, but to make it angry. In order to block the virus from elsewhere, it is important to cover your mouth with all kinds of poisoning rather than blocking your nose. Such self-reflection efforts of humans should be built with big data and maintain an active passive attitude toward the plague raised in the future.

It is a problem for mankind to be too hostile to disease. Nature should be considered angry. Nature's anger is a natural phenomenon that occurs to lower the entropy of nature as a whole.

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## 7. Contribution

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	Initial name	Contribution
Lead Author	PGY	<ul style="list-style-type: none"> <li>-Set of concepts <input checked="" type="checkbox"/></li> <li>-Design <input checked="" type="checkbox"/></li> <li>-Getting results <input checked="" type="checkbox"/></li> <li>-Analysis <input checked="" type="checkbox"/></li> <li>-Make a significant contribution to collection <input checked="" type="checkbox"/></li> <li>-Final approval of the paper <input checked="" type="checkbox"/></li> </ul>
Corresponding Author*	LYJ	<ul style="list-style-type: none"> <li>-Corresponding <input checked="" type="checkbox"/></li> <li>-Play a decisive role in modification <input checked="" type="checkbox"/></li> <li>-Significant contributions to concepts, designs, practices, analysis and interpretation of data <input checked="" type="checkbox"/></li> </ul>
Co-Author	LWB	<ul style="list-style-type: none"> <li>-Participants in Drafting and Revising Papers <input checked="" type="checkbox"/></li> <li>-Someone who can explain all aspects of the paper <input checked="" type="checkbox"/></li> </ul>

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Ph.D. Gyeongsang National University

## Research field

- An Empirical Research on the Moral Judgment Competence of Korean Young Students: Focused on Comparing P-index of KDIT and C-index of MJT, Gyeongsang National University, Doctoral Thesis (2010).
- Social Enterprise as a New Public Value Implementation, Public Value, 4(2) (2019).

## Major Career

- 2009~present. Gyeongsang National University, Lecturer
- 2012~2018. Seoul National University of Education, Lecturer

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B.A. Busan University of Foreign Studies

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## Research field

- A Study on the Factors about the Job Stress of Military Women, Naval Leadership Studies Journal, 5 (2013).
- A Study on the Military Personality Education in Terms of Mental Education, Journal of Spiritual & Mental Force Enhancement, 51 (2017).

## Major career

- 2005~2010. Defense Leadership Center, Research Fellow
- 2010~present. Navy Leadership Center, Professor
- 2015~Present. Police Training Institute, Professor