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# Direction of Global Citizenship Education in the Age of Infodemic : A Case Study of the COVID-19 Pandemic in Korea

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#### Abstract

In 2020 when the COVID-19 pandemic began in full-scale, the WHO Director-General warned of the dangers of an infodemic. The infodemic is a phenomenon in which false information spreads rapidly like an epidemic and causes chaos, and it was noted that the COVID-19 pandemic is not just limited to health problems, but also linked to a variety of issues such as human rights, economic inequality, various discrimination, hate speech, fake news, global governance etc. In the field of education, it is necessary to think about how to connect this global situation with school classes. Accordingly, this study suggested the direction for global citizenship education by analyzing how the infodemic spreads on Korean social media with the case of the recent global COVID-19 pandemic. According to the research results, the rate of negative emotions was higher than positive ones in the emotions that generate infodemic, while anxiety and anger were focused among negative emotions. In addition, the infodemic tended to spread widely with the feelings of anger rather than anxiety, and the feelings of anger led to advocating aggressive policies against certain country and regions. Therefore, global citizenship education is required to focus on a sense of duty and responsibility as a citizen, not on the level of national identity based on an exclusive sense of belonging. Furthermore, global citizenship education needs to lead to presenting a blueprint for education in a way that can enhance the awareness of the global community for joint response to global challenges and realize common prosperity based on sustainability and justice.

Keywords: Infodmc, social media, COVID-19 pandemic, Global citizenship, Education

#### 1. Introduction

While the WHO officially declared the novel coronavirus-19(COVID-19) as a pandemic on March 12, 2020, the pace and scope of this terrifying virus' spread suspended the daily life of the global community in unprecedentedly massive fear. Given the fact that the Zika virus(2014) and Ebola(2014-2016) experienced in the near past were limited to Latin America or West Africa despite of their contagiousness, which did not lead to the declaration of a pandemic, the global spread of COVID-19 resulted in a completely different situation, characterized by a real pandemic. What's more, the medical community is warning that COVID-19 is just one of many cases of mass infectious diseases of pandemic proportion that could spread rampantly over and over again in the near future.

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As is well known, the impact of the pandemic is not simply limited to health issues, but causes repercussions in all fields, including economy, society, politics, and culture. Therefore, the current global community seems to stand at a critical time that requires accelerated shift in the social and organizational paradigm in the future. In the meantime, it was false information spreading as quickly and widely as the globally spread COVID-19 virus that made this situation worse. For example, there was a funny incident in which people conducted a breath-holding test in a building in London, England, amid false information that 'you can self-diagnose the virus by holding your breath for 10 seconds' [1]. In Iran, the false information that 'strong alcohol kills viruses in the body' also led to an unfortunate accident in which hundreds of people died after consuming methanol alcohol instead of alcohol [2]. That is not all. In India and Brazil, false information has spread that the organs of inpatients with coronavirus have disappeared, raising distrust of medical staff. False information served as a factor to raise the voice of slander that visualized social prejudice against medical staff, Asians, religious groups, minorities, pharmaceutical companies, and specific countries or groups, as well as fear of infectious diseases.

Infodemic is a state in which it is difficult to determine which information is right or wrong due to a huge amount of fake news, ranging from simple misinformation or inaccurate claims to intentionally circulated false information on the Internet [3]. Infodemic is raging in the wake of the COVID-19 pandemic. With the characteristic of being usually prevalent in major global events or property situations, infodemic utilizes people's fear and anxiety to visualize the prejudice that already exists in society. This infodemic is evolving by changing the contents of fake information from time to time. Even those who have been deceived once in the past to know the fact and have no more interests are also fooled again by infodemics that seem to be new, even though the essence is the same. As COVID-19 is more fatal for the elderly or those with chronic diseases, infodemic causes a problem mainly for those who lack knowledge about infectious diseases and COVID-19, those who have poor judgment on issues, and those who are easily fooled by new stories without skeptical thinking. A person infected with COVID-19 once is not easily infected again for a certain period of time. However, infodemic is the exact opposite. People who have been infected once are easily infected again, and those who have never been infected will not get it, no matter how plausible and interesting infodemic goes around in society. At a time when global infectious diseases are expected to appear on Earth again in the future, fundamental measures are required to effectively cope with the infodemic.

Therefore, this study aims to present global citizenship education that has emerged in the midst of a consensus on the need for a conceptual framework for educational practice in response to global issues related to the future of mankind in recent years. Global citizenship education is not a means of conveying existing information in a standardized format, but rather a series of process of gathering the dispersed efforts that have been made by many actors in different regions and at various levels to solve problems related to the future of Earth and mankind. The purpose of global citizenship education is to create a universal and global education paradigm suitable for the 'global village era' by reflecting it in each country's education policies and embracing it as the educational mission of the global village [4]. So, if proper global citizenship education is provided, we will not only be able to overcome the existing prejudice in society, which is the fundamental cause of infodemic, but also have an attitude to solve global problems as a global citizen.

# 2. Infodemic problems and historical cases

#### 2.1 Infodemic problems

Infodemic, a combination of 'information' and 'endemic', is a newly-coined word that means a phenomenon in which wrong information is rapidly spread through online, etc. However, infodemic is

sometimes called information epidemic because it spreads wider than endemic diseases that occur in a specific region beyond time and space like an epidemic. Fake news, false information, and malicious rumors are spread recklessly through the media or the Internet [3]. Infodemic is not limited to diseases. It attacks both individuals and groups for politics, economy, society, culture, and art. For this reason, many media outlets even create and operate fact-checking teams. The role of the media is said to distinguish between facts and lies, but verifying information spread online has emerged as their new scope.

The World Health Organization(WHO) defines infodemic as follows: "Too much false or misleading information that appears in the digital or physical environment during an outbreak of disease." Infodemics create chaos that can harm health. In particular, it prompts certain actions to be taken, even at risk. It is to refuse vaccines or receive unproven prescriptions. Infodemic can worsen or prolong outbreaks when people are not sure of what to do to protect the health of themselves and those around them. With extended use of social media and Internet, or increased digitization, infodemic can grow more rapidly. Digitization can help fill information gaps more quickly, but it can also amplify harmful messages as such [5].



Figure 1. WHO's tweet to warn against infodemic

David J. Rothkopf, a visiting professor of international relations at Johns Hopkins University, encountered an false information that occurred when SARS was spreading around the world in 2003, and he first named it as infodemic. He explained that "some facts mixed with fear, speculation and rumors are amplified by modern information technology and rapidly transmitted around the world," and "it is completely disproportionate to reality and affects economy, politics and security at home and abroad." Prof. Rothkopf also pointed out that "it behaves exactly the same as a disease in every way, including all identifiable symptoms, well-known carriers, and even simple treatments" [6].

This infodemic can be referred to as a virus mediated by the Internet or media, which can also cause global panic [7]. It also brings about irrational behavior in humans and blurs judgment on important issues that need to be addressed. Furthermore, it weighs down on infrastructure, destroys market economies, and undermines governments. For this reason, China has even detained 4 people who spread false information about SARS. "If information is a disease, knowledge is a cure," Prof. Rothkopf stressed. On the other hand, the infodemic triggered by the modern information society also has advantages. Prof. Rothkopf emphasized that it is an 'early warning'. However, this advantage applies only when the information is objective and valid with the a possibility of objection and correction.

#### 2.2 Historical cases of infodemics

The plague that swept Western European society in the 14th century can be presented as a representative historical case of infodemic. In the past, the plague was spread through merchants, refugees, travelers and their luggage. As the plague spread rapidly, people started looking for scapegoats, and there were people who scourged themselves or claimed to be ascetics to atone for the sins committed by the world. In the Middle Ages, the power of religion was so strong that they dominantly believed the Black Death was a

punishment inflicted on the world by the angry God, but the human instinct was raised at the same time without fail to seek out and punish those who angered the God. This became the goal of fanatics, leading to the production and circulation of poison conspiracies about Jews poisoning wells to kill Christians. Every subsequent incident resulted in the killing of Jews, followed by genocide [8]. Cholera is a representative case of the infodemic problem since the 19th century. In 1830, Prussia, located to the west of Russia and Poland, took measures to prevent the influx of cholera. Citizens quickly realized that the plague was spreading rapidly, and various documents on the cholera appeared in massive numbers. In the catalog of the 1830 Leipzig Book Fair, more than 160 documents related to cholera were registered, or there appeared newspapers dealing only with cholera-related information [9]. In addition, there was an incident in Asia in which the Japanese government encouraged rumors about the underdog Koreans in the process of recovering from the great earthquake in Kanto, Japan in the 1923, resulting in the genocide of Koreans. As a devastating disaster with 3.4 million victims, it created a strange atmosphere in which groundless rumors arose out of social unrest and distrust. It was a tragic incident in which Koreans were massacred due to groundless rumors such as 'Chosun people set fire,' and 'Chosun people put poison in the wells' [10]. And the recent outbreak of COVID-19 virus in Wuhan, China, in 2019 has caused incorrect information to spread rapidly through the Internet and mobile phones as well as numerous casualties, leading to a lot of damage. Moreover, people came to buy medicine or face the mask crisis when they received a message with a provocative title such as 'Urgent' or 'Important'.

Even in the past when there was no Internet, there was a phenomenon in which misinformation spread like an epidemic. The reason why today's infodemic problem should be noted is that the spread of misinformation through the Internet has become incomparably faster than in the past, and the resulting damage is also greater. Then, what are some examples related to infodemic in the recent COVID-19 pandemic?

As the pandemic situation caused by COVID-19 spreads around the world with the recent fear and confusion, the current infodemic stemming from COVID-19 seems to be exerting tens of times more power than SARS. In particular, false information and fake news overflowing online today threaten the entire social order. In the U.S. and Europe, rumors circulated that the production of toilet paper would decrease because the raw materials for toilet paper were the same as masks, causing a chaos in the stockpiling of toilet paper. In the UK, when false information prevailed that COVID-19 spreads through 5G mobile telecommunication radio waves, there was an incident that excited citizens set fire to 5G base stations. And in Iran, when false information spreaded that industrial alcohol prevents COVID-19, 525 people died out of more than 5,000 after drinking methanol. People's anxiety grew even more along with the alleged conspiracies that COVID-19 was accidentally leaked during secret cultivation in a Chinese laboratory or that the US government intentionally spread it as a biochemical weapon to control the population. There were also ridiculous rumors spreading everywhere that the COVID-19 vaccines might alter genes, that the chips in the vaccines might cause loss of life, or that crows flocked to the corpses when the COVID-19 pandemic was rampant in downtown Wuhan, China. These were cases where people's anxiety further proliferated with false information.

As a result, global and unpredictable disaster situations such as the spread of COVID-19 have accelerated 'information overeating' more than ever. It resulted in people accepting the information pouring in from here and there without filtering due to the anxiety of not knowing who will be infected and when, in an uncertain situation where the precautionary measures that were effective yesterday are discarded today.

# 3. Analysis of the infodemic phenomenon on social media

## 3.1 Analysis method

This study attempted to examine what kind of contents are appearing in relation to the infodemic about COVID-19 on social media, which is the center of the infodemic phenomenon. To this end, the collection period was set from January 20, 2020 when the disease was officially named COVID-19 by WHO to December 31, 2020, and the search words were selected as keywords related to COVID-19 (Corona, Corona 19, Corona-19, COVID, COVID19, COVID-19). Posts were collected through the crawling method, a technique of bringing information from a specific page into a desired format via Textom, a big data online analysis platform. A total of 240,000 public posts were collected from the top 2,000 posts with relatively high number of views per month. Next, the examples of infodemic in the collected posts were classified into 6 types by referring to the types of infodemic that occurred in the COVID-19 pandemic presented in previous studies.

Table 1. Types of infodemics about COVID-19 and examples of content

Classification	Type	Example of content	
Type 1	Raising the needlessness for mandatory measures	Social distancing is enforced for political reasons.	
Type 2	Wrong or harmful medical advice	A large number of unidentified microorganisms were found in vaccines.	
Type 3	Incorrect correlation between eating habits and immunity	You can prevent the virus by eating garlic or sesame oil or applying it to your nose.	
Type 4	Lack of pandemic severity	COVID-19 is no different from the common cold.	
Type 5	Forced purchase of fake protective device prescription	It is also effective if you wear regular masks in multiple layers.	
Type 6	Virus spreader hate	If you open a package from China, you will be infected with COVID-19.	

In addition, descriptive statistical analysis was conducted through Textom in this study for efficient analysis of data, and Netminer 4.0 was used for network analysis. Netminer is a professional network analysis software that reflects the analytical requirements of big data [11], which produces and implements data analysis by applying methods such as social network analysis, statistics, data mining, machine learning, etc.

## 3.2 Analysis result

## 3.2.1 Keyword-based emotional analysis

First of all, positive, negative, or neutral values were allocated to the information collected for people's emotional analysis on infodemic-related topics. It is classified as 'neutral' if there is no emotions in the content mentioned on Instagram, or if there is no meaning for emotional analysis as it is created by a simple link or machine. The distribution of collected Instagram and the top 10 keywords are summarized in Tables 2 and 3.

**Table 2. Corpus statistics** 

	Positive	Negative	Neutral	Total
#hashtag	4,638(13.3%)	11,185(32.2%)	18,941(54.5%)	34,764(100.0%)
emotion	46,794(68.5%)	21,489(31.5%)	-	68,283(100.0%)

Table 3. Top positive, negative and neutral hashtags used to create data set

Polarity	Keywords	
Positive	ive possible, certain, expect, safe, easy, thank, want, prospect, clean, nice	
Negative	e angry, dislike, crisis, concern, tough, difficult, problem, ignorant, lack, damage	
Neutral	region, government, vaccine, confirmed case, distancing, infection, treatment, prevention,	
	mask, spread	

According to the results of emotional analysis, there were more negative responses than positive responses to the COVID-19 related infodemic, except for neutral results. Among them, anger-related emotions such as 'angry' and 'dislike' were more frequent than anxiety-related emotions such as 'concern' and 'tough'. In addition, expressions of belief in fake information such as 'possible' and 'certain' were more frequent in the positive responses, and in the neutral responses, 'region' and 'government' were found to be highly frequent. In particular, neutral responses are what people often use when mentioning infodemic cases associated with 6 types presented in Table 1 on social media. Therefore, it is possible to interpret the meaning through the connection between responses, and to know which responses agitate people's emotions.

## 3.2.2 Keyword-based network analysis

Network analysis is a method of quantitatively analyzing the topological structure and diffusion/evolution process by modeling the relationship between individuals and groups as nodes and links. In this study, the contents of the infodemic about COVID-19 on social media were transformed into nodes to analyze the link structure between nodes. Figure 2 is to identify the characteristics of the cohesion structure of the infodemic examples mentioned on social media(a). As a result of clustering nodes closely connected to the dispersed infodemic contents about COVID-19(b), it was confirmed that they were cohesive centered on keywords such as 'region, government, vaccine, prevention, mask, cold'. These keywords can be considered as keywords representing the 6 types of infodemic presented above.

Considering the 6 types of infodemic shown in Table 1 and the connection between the keywords, the meaning is interpreted as follows: First, 'region' refers to extreme nationalism that discriminates against one's own country or race, considering a specific region or a race belonging to that region as the cause of the spread of COVID-19. 'Government' is a keyword that is highly associated with Type 1, which is often mentioned by slandering or futility of a particular country's policy or system. Likewise, 'vaccine' is a keyword that is highly associated with Type 2, which promotes fear by emphasizing the dangers of vaccines produced by specific countries among several types of vaccines. In addition, 'prevention, cold, and mask' are keywords symbolizing unverified information associated with the effectiveness of COVID-19 prevention, showing conflicting attitudes toward preventive measures presented by the government. The infodemic types related to these keywords correspond to Type 3, Type 4, and Type 5, respectively, and can be interpreted as anti-nationalist attitudes that resist extreme nationalism, such as Type 1, Type 2, and Type 6.

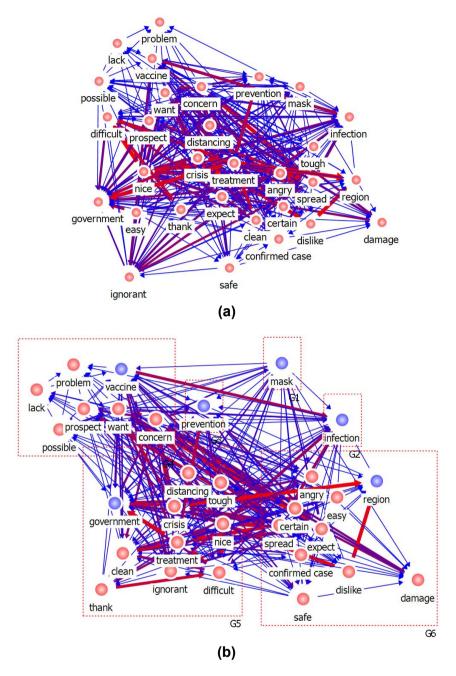


Figure 2. Analysis of cohesion structure of keywords related to infodemic

Next, the out closeness centrality between the top 5 emotion keywords and the 6 infodemic types for COVID-19 are as shown in Figure 3. What should be noted here is as follows: the fact that anger-related emotions are highly associated with 'region' and 'government' types means that the infodemic for COVID-19 spreads based on anger against a specific country or region that amounts to extreme nationalism. And the fact that emotions related to people's anxiety and expectations were found to be highly associated with 'mask' and 'cold' types is judged to reflect the commercial intention of using anti-nationalist attitudes. As a result, it was found that the infodemic for COVID-19 is adding to the damage by making people angry at certain targets, blurring their judgment on important prevention and treatment.

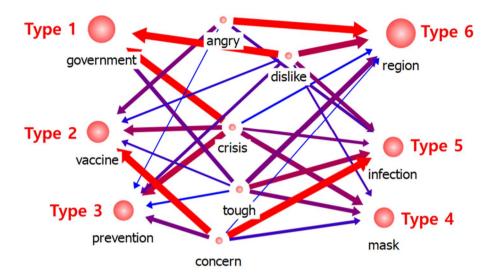


Figure 3. Out closeness centrality between 6 infodemic types and top 5 emotion keywords

## 4. Direction of global citizenship education according to social media analysis results

### 4.1 Seeking convergent solutions to global issues

As shown in the results of Korea's social media analysis, infodemic spreads extrame nationalism around the emotion of anger, which naturally advocates aggressive policies against a specific country or region and blurs judgment for solving problems. In order to solve the root cause of this phenomenon, the importance of global citizenship education based on globalism must be further emphasized and implemented in the right direction.

In Korea, the term 'global citizen' has already appeared as a human image in social studies education from the 7th curriculum in 1997. In addition, a significant part of the main topics and contents set as learning goals in global citizenship education has already been covered in depth for a long time through the existing school education as well as peace education, multicultural education, environmental education, and human rights education by lifelong educational institutions, various NGOs, or civic groups.

Nevertheless, considering the infodemic phenomenon that occurs in various fields of society through social media, it raises questions of whether the existing global citizenship education fulfills its role properly. In this context, global citizenship education should not be a means to communicate existing information in a standardized format, but rather a series of processes in the direction of understanding globalism that converge the dispersed efforts made by multiple actors in different regions and at various levels in order to solve problems of the future of Earth and mankind. This approach will allow us to have the capacity to take a more effective and coordinated response to various forms of global crises, which will result in converging fragmented efforts so far to seek a common path for the global community to find educational solutions to global problems such as COVID-19.

### 4.2 Emphasis on global civic duties

According to the results of social media analysis on COVID-19, the type of infodemic shows contradictory aspects as extreme nationalism toward totalitarianism and anti-nationalism toward individualism appear together. This aspect is not different from the concept of 'global citizen'. The concept

of 'global citizen' presupposes 'globalization', which manifests both universality and fragmentation [12]. Thus, the contradiction inherent in this concept stems from its inevitable property that involves both the spread of globalization and the resistance to globalization at the same time over a wide range of regions. Moreover, the most frequently discussed issue in relation to the conceptualization of global citizens is whether it is possible to form an identity as a 'global citizen' among individuals in the absence of a political structure as an entity that governs the world. This leads to the question of how the cultivation of national citizenship, which is treated as an important purpose in state-led school education, can compromise global citizenship in a transnational and transboundary context.

However, it should be noted that oversimplifying the use of the term 'global' forces us to think in a way based on the binary opposition of 'state' versus 'world', which only further fuels misunderstanding of the concept of global citizen. In order to establish the term 'global citizen' at this point, it is required to adjust the contradictory combination of the 'global' as a trans-boundary concept and 'citizen' based on the exclusive collective identity that is bounded, and establish it as a coherent concept.

For this purpose, it is necessary to deal with the concept of 'citizen' not in terms of national identity based on an exclusive sense of belonging, but mainly in terms of the sense of duty and responsibility one has as a citizen. In other words, the term 'global citizen' will not be so awkward if we accept the meaning of 'citizen' based on civic duty rather than civic identity. Civic duty, which is mainly discussed at the national level, refers to the voluntary commitment and fulfillment of duties by individuals to the cause of their group. In this respect, all behavioral codes for caring for groups before individuals and others before oneself can be integrated into civic duty. The group means a global level that goes beyond the level of a country or region. In other words, applying civic duty to the broader concept of global citizen, we can envision individuals who sympathize with global issues and fulfill their obligations for the cause of mankind as a member of the global village. Therefore, global citizen refers to the spirit of individuals who are willing to expand the scope of their participation in order to effectively respond to global problems such as COVID-19 without remaining in an exclusive collective identity.

#### 5. Conclusion

Globalization has deepened interdependence and interconnectivity among regions in the 21st century, and an example is the operating principle of the global value chain(GVC). This is a collaborative mode in which the entire process of the value chain from product planning, production, promotion, and sales, is carried out at the global level. These connections are very efficient and will inevitably intensify with the development of science and technology. However, sometimes it is also a precarious link that could collapse in an instant if borders are closed due to this kind of infodemic situation or a return to nationalism. While global value chains show a material connection between global actors, global citizenship represents a spiritual connection. In this context, global citizenship can be seen as a product of globalization and its responsive mental mechanism at the same time.

The post-COVID-19 world is expected to undergo a global paradigm shift by changing the way humans communicate, which can be a new challenge unprecedented in human history. Thus, global citizenship education requires conscious efforts to put into practice the educational obligation to embrace everyone so as to enable a pluralistic understanding and critical reflection on the situation facing humanity in the 21st century. In other words, global citizenship education should present important educational implications on where to prioritize without being swayed by the infodemic phenomenon, when making choices that guarantee human sustainability in an environment where international cooperation is desperately needed, such as a pandemic situation. This is because global citizenship education aims to unleash the sense of

calling of the times that demonstrates the sense of duty with global citizenship, as a member of the global village and as a global citizen, going beyond the immediate national and regional interests.

Consequently, the goal of proper global citizenship education is to create a blueprint for education in a direction that can enhance the global community awareness for joint response to the imminent global challenges and realize common prosperity based on sustainability and justice. It encourages us to rethink the existing priorities, as it promotes educational values that drive conscious choices to abandon closed mindsets and regional selfishness based on self culture-oriented logic. And in order for global citizenship education to fulfill its role, it is necessary to take an approach that helps the global community face the reality of our time, rather than taking simple idealism or imagined solidarity as its center. The value of an abstract concept like 'global citizenship' becomes meaningful only when it is followed by the practices supported by global citizenship education. When these efforts are underpinned, humanity will have a chance to overcome the waves of global crises that threaten our survival for decades to come.

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