

## Network Analysis of Social Awareness of Media Education for Primary School Students Studied through Big Data\*

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**Abstract.** One of the core competencies of students who want to improve in future education in the 21st century is the ability to utilize media. Primary school students entering the school age can be regarded as the right time for media education because of their high adaptability and capacity for media. The purpose of this study is to examine the social debate about media education in Korean society, how media education is being conducted in this important primary school period. For this study, big data was collected in the last 5 years (2014.08.07-2019.08.07) from internet portal sites with keywords of “primary school media education” and “primary school media literacy”. The data collected with Textom and Ucinet 6.0 was utilized as a data analysis solution. Semantic network analysis, CONCOR analysis, and content analysis were used as data analysis methodology. As the result of CONCOR analysis of 'Primary school Media Education' in this study, 'Direction of future education in the era of the 4th industrial revolution', 'Preparation for future education', 'Various factors related to expansion of future education program', 'Expansion to Four factors were derived, including 'Application to advanced classes' factor. In the 4th industrial revolution, primary school students are using media and digital devices in class. In particular, it was confirmed that not only curriculum for academic subjects such as English and Mathematics, but also new curriculum for new subjects such as coding, big data education are actively being conducted in the education field. Accordingly, it is revealed that it is the right time to provide future education that can have a sound digital identity so that media education can be achieved in a media-friendly local community and educational environment.

**Keywords:** Big Data Analysis, Network Analysis, Content Analysis, CONCOR Analysis, Primary School Student, Media Education

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## 1. Introduction

The media environment is rapidly changing and developing with the development of high-tech information and communication technology in this era of the Fourth Industrial Revolution. Media literacy is becoming more important, and the need to develop the ability to critically accept media is increasing as the perception spreads that no one can escape the influence of the media in the knowledge information society. Through this, media education is designed to facilitate the use, sharing and fostering communication skills of the media as a preparation for media changes [22].

The development of communication technology has brought a change in media education. The dissemination of digital media has combined the functions of each media, the change to an interactive form of communication through the Internet has led to the need for a more active and creative producer image, and the educational environment was transformed by the development of information and communication technology and communication technology emphasizes the need for a learner-oriented active and participatory media education from childhood.

Just as we have to learn letters and grammar to read, write and understand text, media education is needed to facilitate understanding of grammar and skills of emerging media and content analysis. In particular, since the use of media medium by children continues to increase, the effectiveness of education has been constantly studied in South Korea and abroad.

Previous studies have reported that the media use of children is a major cause of negative development, but cannot be determined. However, it has been reported that it has a significant effect and reported the potential harmfulness of media.

This is the time to emphasize on the importance of media education especially for students in elementary school, when media use is rapidly increasing.

In the digital revolution and the fourth industrial revolution, the educational ecosystem is being recreated and rapidly changed. Moreover, this is an era that the educational ecosystem should be designed to customize learning materials and information for learners [14]. From this point of view, the media is coming to us with forms of smart running, digital revolution, etc., and it can be seen that rapid media changes and developments are affecting the way children think and behave in sociocultural changes.

The use of the Internet and TV by children in today's homes is very common, and the proportion of elementary school students owning cell phones has also increased recently, children's use of the Internet, TV, and mobile phones has become an aspect of their lifestyle. A meaningful prior study [11] reported that the Internet and TV could be tools for developing elementary school students' potential, such as information exchange, learning promotion, and leisure activities, while having ambivalence that can hinder elementary school students' healthy growth and emotional development, including game addiction, pornography, distribution of violence, and various cyber crimes. As such, the importance of media education cannot be overemphasized because the media has great influence on the growth and development of children depending on the direction of media utilization.

Given that media education should be conducted in various ways and channels, media education should be implemented in conjunction with home and society, not only through conventional school education. And the study of media education should

continue throughout one's life. Media education, especially in elementary school, is more important because it has a profound impact on the overall development of children.

The Davos Forum in 2012 presented 'big data research' as the most powerful tool for social awareness and resolution for social issues [7]. It is necessary to consider big data generated on the web to review social discourse and practical requirements related to media education for elementary school students. Big data encompasses the vast scale and various kinds of web-based data generated in a digital environment [7, 31], characterized by hyper-connectivity and super-intelligence in the era of the Fourth Industrial Revolution, allowing the rapid processing and analysis of vast amounts of Internet-connected information to derive meaningful results and implications, and to analyze and deduce complex meanings [15]. In the field of education, various studies have already been accumulated, and opportunities to connect and analyze them have increased. Big data and network analysis help to actively accommodate changes in the environment by forming new theories and reconstructing their own perspectives.

Although some studies on the perception and current status of media education studied so far have been conducted [6, 14, 19, 30, 39], most of the studies have been to develop programs for media education and to improve attitudes toward media education. Therefore, it can be seen that there is a lack of research on the general perception of media education including media education. Moreover, media education research for primary school students has not been conducted until now. Given the predictions of futurists that the digital learning ecosystem will occupy a large part of the educational space, it is necessary to examine the social perceptions of media education for primary school students through big data.

In this study, we want to look at the social perception of media education of Korean elementary school children created over the past five years through big data. We also want to analyze the network and contents of social awareness to derive the social discourse contained in media education. The study, which explores major issues through social awareness of elementary school children through big data, will reveal social interest and awareness of educational phenomena and suggest implications in more diverse aspects. The research questions of this study are as follows.

1. What is the social recognition about media education for primary school students shown in Big data?
2. What is the social recognition about media education for primary school students shown through content analysis?

## 2. Related Works

As media discussions progress, media education is used as an extended concept not only to media use and understanding, but also to media abilities and communication skills, which are active dimensions. In other words, it includes the content delivered by the media and the human's total ability to be free from the media, and the ability of individuals to participate in the communication domain as a political component [32].

In fact, the expansion of this concept can facilitate the entry of media education into schools. This is because school education seeks direction through creative education in

the knowledge-based society as the times change. However, the reality is that it is difficult to grasp what kind of education is being conducted in connection with media education and to what extent substantial education is being implemented. This is because it is difficult to comprehensively grasp the current status of media education due to the variety of media education units, educational subjects, and program types at the school site [17].

Therefore, in order to improve the system of media education, it is necessary to take a closer look at what level of media education currently being conducted. Especially, the problems of media education are often mentioned, so it is necessary to check the status of media education. The preceding studies related to media education are as follows.

As a result of [25] analysis using an in-depth interview to analyze how internet-related media education is defined and recognized in the field of primary education, the media is not grasped from a simple tool point of view, but it is suggested that the primary school education should go toward internet related media to gain critical media literacy perspective [8].

As a result of a survey conducted on primary school students, 'A study has been reported that excessive use of media for more than 7 hours a day is reported. There is also an intensive study [12] insisting that multi-dimensional instruction is needed to form daily habits for media use in the early stage of primary school period. From this early primary school period, it was suggested that special attention should be paid to the use of media, and that the quality of media used by students should be considered.

In addition, looking at existing media education literature, focusing on the intellectual acquisition of media and production of content, or obtaining the right attitude to use media is approached only through the program contents and evaluation of media education. Or, a critical interpretation of the media education program includes studies that remain at the primary school level [1, 20, 28, 33]. As described above, most of the previous studies constitute and evaluate content production and programs, or derive the suggested research results through surveys and interviews so there's limitation go generalize the research result. In order to elicit generalized implications, this study intends to examine the Korean society's perception of 'primary school media education' quantitatively and qualitatively by combining big data analysis and content analysis.

In particular, as big data is referred to as 'crude oil of the 21st century', and has been noted as a key technology and promising industry in the future [4], 'big data' is a hot topic in all walks of life. Based on the news coverage of the media through big data analysis and the public's thoughts, we can examine what issues and values of media education are forming discourse in our society, and deduce how the direction of social perception is moving forward.

### **3. Research Method**

In this study, for the process of collecting and refining big data for media education, original data were collected using Textom, and then the first and second data refinement processes were implemented [24]. Programs such as Textom, Ucinet 6.0, and Netdraw were utilized as data analysis solutions to perform network analysis among keywords

related to media education. As data analysis methodology, semantic network analysis, CONCOR analysis, and content analysis were conducted.

**Table 1.** Research procedure

Data collection and 1 <sup>st</sup> coding	Internet Portal Site		
	Google	Naver	Daum
	<ul style="list-style-type: none"> <li>•Big data is collected from news, articles from online communities, blogs, etc. on the Internet portal site</li> <li>• In the first refinement, only nouns were extracted when data was collected, and special characters and symbols were not included</li> </ul>		
↓			
Data refinement and 2 <sup>nd</sup> coding	<ul style="list-style-type: none"> <li>•Read the articles collected by Internet portal sites</li> <li>•In the second data refinement, data that had been first refined was used, numbers, words in English, and pronouns in the data were deleted, and overlapped documents were removed. (Contents not related to primary school media education or media literacy education are deleted)</li> <li>•Media education classification by Internet portal site</li> </ul>		
↓			
Network analysis	<ul style="list-style-type: none"> <li>•Textom(text mining), Ucinet 6.0, Netdraw</li> </ul>		
↓			
CONCOR analysis	<ul style="list-style-type: none"> <li>•Classification of media education factors by cluster extracted using CONCOR analysis</li> </ul>		
↓			
Article selection and Content analysis	<ul style="list-style-type: none"> <li>•Selecting articles suitable for factors extracted from CONCOR analysis</li> <li>•Review of articles extracted by factors</li> </ul>		
↓			
Results	<ul style="list-style-type: none"> <li>•Research results and implications</li> </ul>		

### 3.1. Data Collection & Data Refinement

Data collection includes all stages of data collection, data cleaning, data clustering, and visualization, from large amounts of relatively low-valued data to the process of obtaining insightful and advanced information [26].

The data collection was performed using a computerized automated method, and the collection method was collected using a public API (Opne Application Interfac: Opne API).

The purpose of this study is to find out what social perception of primary school media education is. For this, big data was collected from newspaper articles, articles from online communities, blog articles from Internet portal sites such as Google, Naver, and Daum. Total collected big data from 2014.08.07. to 2019.08.07. is 2,755KB.

In the first refinement, only nouns were extracted when data was collected, and special characters and symbols were not included. In the second data refinement, data that had been first refined was used, numbers, words in English, and pronouns in the data were deleted, and overlapped documents were removed.

### **3.2. Semantic network analysis**

By analyzing specific topics of unstructured text big data through semantic network analysis, it is possible to accurately and quickly grasp various viewpoints, needs, and emotions of our society. Big data is a continual record of what is happening, and when analyzing data from various sources, it can be used as a direction to grasp the ripple effects of policies or to seek new policies.

Data and information created by a large number of unspecified masses are converted into text to analyze the relationship among key keywords according to needs and purposes, making people's behaviors and psychological states predictable, and recognizing keywords as nodes in text. So it is possible to make a network through visualizing by connecting the relationship with a line.

### **3.3. CONCOR Analysis**

CONCOR analysis was performed to grasp the relationship among keywords. In particular, CONCOR analysis can be grouped into the same group among words. In other words, it is a technique used to identify characteristics of similar types or to observe differences between the group and other groups by analyzing the characteristics by dividing the target group with many changes into a certain group and analyzing the distance between the data. In addition, weights are assigned depending on the importance in context and appear as bold lines. Words with similarities among words are not arbitrarily manipulated by the researcher, and given data are defined by themselves through computers and grouped within the same cluster. Accordingly, it is possible to check the meaning according to which word clusters appear.

### **3.4. Content Analysis**

This study selects the content analysis method [3] to identify the social trends in media education of primary school students. This is because it is suitable for systematically analyzing the characteristics of messages from various types of text displayed on the

Internet portal sites. Regarding the content analysis method, [38] defines “content analysis is a systematic procedure designed to investigate the content of recorded information”.

## **4. Experimental Results**

### **4.1. The statistical significance test of whole network for media education for Primary School Students**

In this study, the statistical significance of primary school students' media education was examined with 2,755KB of data refinement from big data searched in the last 5 years (2014.08.07.-2019.08.07.) for the purpose of identifying the social recognition with the key words, ‘Media education for Primary school students’ and ‘ Media literacy of Primary school students’.

In order to statistically test whether the estimated density of the network was accidental, the single-sample mean difference was tested using bootstrapping[5].

As a result of the study, the mean distribution of the mean network data was 24.31 and the standard error was 2.38. Looking at the Z-score value, the standard score, it was found to be statistically significant at \*\*\* $p < .001$  level with  $Z=9.9578$  and  $P=0.0002$ .

In other words, in this study, it can be seen that it is appropriate to interpret the analysis results with the entire network for media education of primary school students.

### **4.2. Frequency analysis of keywords related to media education for primary school students**

In Primary School Media Education, the words 'Child', 'Education', 'Teacher', 'Object', 'Primary School', 'Class', 'Student', 'Program', 'Media', 'Digital' etc. are the key words and it was revealed that they are the new agenda in the new era.

In particular, it can be assumed that digital device-based education is being activated in education programs for children and adolescents as the future education of the 4th industrial revolution.

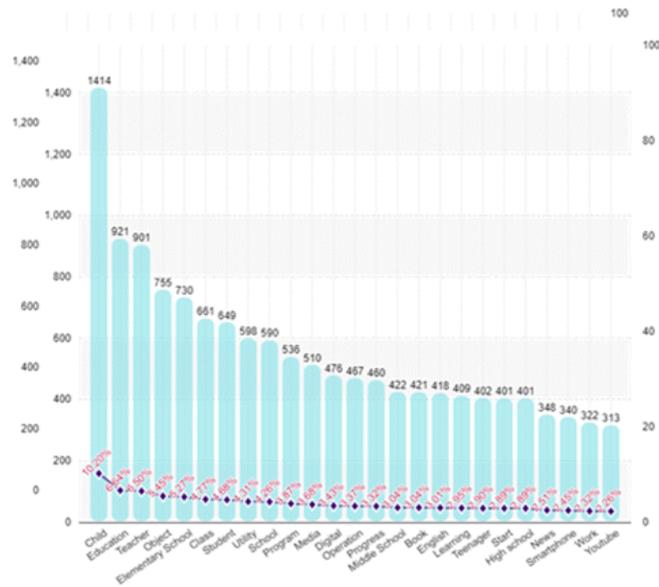


Fig. 1. Top 25 word bar chart of "Primary School Media Education"

### 4.3. Network analysis of media education for Primary School Students

In order to examine how the centrality of the keywords in the network appears, the centrality analysis focused on the center of Dgree, the Closeness, and the Eigenvector. Centrality is a measure of the relative importance of vertices or nodes in a graph or Semantic network[23]. It can be seen that the words located at the center of the network represent a high value and constitute a core issue.

Table 2. Analysis result of 'Degree Centrality' using Ucinet

No	Word	Degree	No	Word	Degree
1	Child	3170	11	Digital	1677
2	Teacher	2779	12	High school	1562
3	Education	2508	13	Operation	1554
4	Object	2422	14	Media	1553
5	Utility	2048	15	Progress	1479
6	Primary School	1904	16	Learning	1312
7	Program	1870	17	English	1248
8	School	1804	18	Middle School	1243
9	Student	1751	19	Teenager	1214
10	Class	1680	20	Mathematics	1168

First, looking at <Table 2> showing the 'Degree Centrality' figures, 'Child', 'Education', 'Teacher', 'Destination', 'Primary School', 'Class' and 'Student' in terms of 'Degree Centrality', 'Program', 'Digital', and 'Media' are used in connection with many words. Based on this, it implies that when applying primary school media education to actual classrooms, it is necessary to provide a “media program” focusing on individual “children” education services.

**Table 3.** Analysis result of 'Closeness Centrality' using Ucinet

No	Word	Closeness	No	Word	Closeness
1	English tutoring	63	11	Coding	52
2	Mathematics	62	12	Study	52
3	Practice	57	13	Posts	52
4	Future	55	14	Multimedia	52
5	Training	54	15	Parents	52
6	Summer Vacation	53	16	Object	51
7	Development	53	17	Primary School	51
8	Game	53	18	Media	51
9	Smartphone	52	19	Teenager	51
10	Youtube	52	20	Textbook	51

Second, looking at <Table 3> showing the values of 'Closeness Centrality', it is composed of the words such as 'English', 'the future', 'Education', 'Mathematics', 'Primary School', 'Smartphone', 'Youtube', 'Digital', 'media', 'coding', 'game', and 'teenagers'. This suggests that media and digital education utilizing 'games' and 'codings' is being introduced in the education field for teenagers.

**Table 4.** Analysis result of 'Eigenvector Centrality' using Ucinet

No	Word	Eigenvector	No	Word	Eigenvector
1	Object	0.324	11	Media	0.119
2	Program	0.273	12	Education	0.118
3	Child	0.265	13	English	0.116
4	Operation	0.23	14	Smartphone	0.111
5	Progress	0.205	15	Learning	0.103
6	Utility	0.183	16	Start	0.101
7	Summer Vacation	0.174	17	Work	0.099
8	Teenager	0.157	18	Book	0.093
9	Digital	0.137	19	Youtube	0.091
10	Experience	0.121	20	News	0.09

Third, looking at <Table 4> showing the 'Eigenvector Centrality' figures, the 'target', 'program', 'child', 'operation', 'progress', 'utilization', 'summer vacation', 'experience', 'digital'. As indicated by keywords such as 'media', 'Youtube', and 'news', it can be seen that when media education is applied to children, it is proposed to apply various media in various educational situations.

4.4. CONCOR analysis on media education for Primary School Students

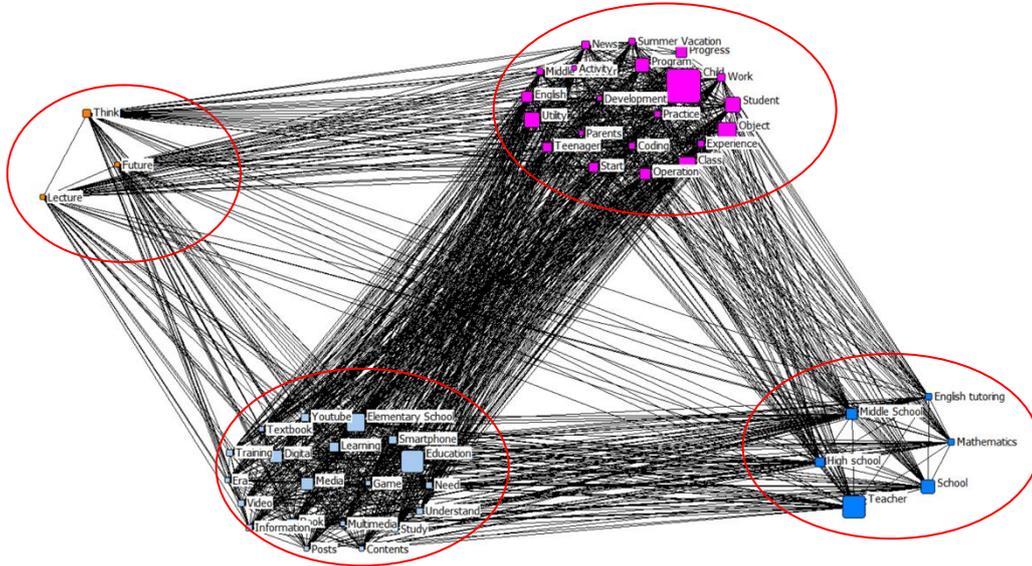


Fig. 2. CONCOR Analysis of “Primary School Media Education”

The table 2 above indicates the data after grouping and visualizing with CONCOR analysis. As you see in the table 2, it can be identified that which words have the highest correlation with the key word “Primary school media education”.

The 4 representative clusters are as follow. They are named as factors for the direction of future education in the 4th Industrial Revolution era, preparation factors for future education, various factors related to expansion of future education programs, and application factors to advanced classes.

Table 5. “CONCOR Analysis of Primary School Media Education”

Clusters	Key word
1. Direction of future education in the era of the 4th industrial revolution	Future, education, thinking
2. Preparation for future education	Education, Textbook, Training, Need, Media, Video, Era, You-tube, Primary School, Digital, Gaming, Understanding, Multimedia
3. Various factors related to expansion of future education program	Child, Student, Target, Operation, Experience, Class, Coding, Start, Parents, Summer Vacation, Progress, Program, News, Middle schooler, Teenager, English, Utilization
4. Application to advanced classes	Teacher, School, High School, Middle School, English Tutoring, Mathematics

#### 4.5. Content analysis of big data of media education for primary school students: focusing on 4 clusters of Concor analysis

##### Direction of future education in the 4th industrial revolution era

The cases in the big data related to future education in the 4th industrial revolution era are as follow.

[Case 1] ...(omitted) The 4th industrial revolution affects our society and overall culture / not ending with changes of industries and economy. We often hear the new term “new normal era” these days. It means that the basic principle which drives our society has changed. Also, this means that the things that were previously taken for granted are no longer taken for granted, and a new naturalness is created. This explains that the 4th industrial revolution has become a “ism” not ending with simple technology and industrial changes. Just as Fordism created modern school system, it can be anticipated that the 4th industrial revolution will create new education system while creating ‘new normal’ in education. (*Siminsori , May 10th , 2018: The 4th industrial revolution, the direction of future education?*)

[10], the renowned historian and a writer, predicted that there is high possibility that the knowledge they learn from school education would be useless, when our children are in their 40s. So we need to try to find implications with these changes in our education field.

[Case 2] ...(omitted) Naun primary school was supported the state-of-the art smart devices such as electronic boards, smart solution, wireless network, 360 gear cameras, tablets, laptops, and mobile devices and so on because the school was designated as Samsung Electronics’s social contribution project. Currently, the school is equipped with smart e-class and it is conducting various classes such as creativity integration education, trouble shooting education, and creativity education by using the various devices that they were supported. The primary school is considered as the exemplary case that improves school education environment and tries to provide education conditions to lead future education revolution going beyond the limitation as a small regional community. (*Naver blog, March 24th, 2019: “ Naun Primary school in South Korea equipped with the cutting edge smart e-class , leading future education revolution ”*)

This is the time that each city needs efforts to prepare new education revolution that is suitable for the 4th industrial revolution era beyond the limits of the classes with using simple multimedia and regional space.

[Case 3] ... (Omitted) In South Korea, coding classes have been mandatory in 2018 for 17 hours per year as a regular curriculum for primary school students in grades 5-6, and they are keeping pace with the global trend in preparation for the 4th industrial revolution. Already in developed countries, education has been mandated to foster talent for the 4th industrial revolution including coding, and voices have been raised in teaching responsible usage and digital citizenship in media use (*Naver Blog, June 13th , 2019: . “Digital Citizen School”*)

Now that coding and big data have become important core education which is indispensable to our children, we have indicated that it is time to teach digital citizenship to children because we need to use digital media with systematic and correct content.

**[Case 4]** ... (Omitted) Vice Chairman Kwak said, "At the point of going from Society 4.0 to Society 5.0, above all, for a rewarding future society, a society in which values are created, a society capable of exerting various abilities, a society where everyone can get a chance, and anyone can safely challenge and a society that goes along with nature need to be established and we need to build capacity and cultivate virtues." He continued, "As technology has created an intelligent information society for humans, above all, we should not neglect to develop social and emotional competence in education for the future life of children." In other words, people-centered education with the virtue of being considerate of others and yielding to others must be emphasized. It is also to nurture people who can create values that the future demands by empowering education that can create better values. (*Digital Today, August 5th, 2019: "People-Oriented Future Creator"*)

Since digital transformation will create positive and negative things that affect society, we will have a future where new science and technology can have a sound digital identity based on common sense of responsibility and true communication to develop human-centered public interest functions. Education should focus on it.

**[Case 5]** ... (Omitted) On September 4th, at the Samsung Primary School in Seoul, The event '2017 Beautiful Internet World Weekly Internet Ethics Tour Lecture and Golden Bell' was held. 131 students in grades 5-6 attended and were able to learn desirable Internet usage habits. ... (Omitted) Seoul Samsung Primary School said, "We expect the students to learn how to use the Internet properly and cultivate healthy usage habits and Internet ethics through this lecture on Internet ethics." We will continue to make efforts to promote for software education activation. (*Naver Blog, September 7th, 2017: Internet Ethics Easily Learned from Quizzes and Cases*)

These events can be a great opportunity for students to think about the seriousness of Internet ethics and cyber bullying.

### **Preparation for future education**

The key words for Preparation for future education are appeared with the node 'Education', 'Textbook', 'Training', 'Need', 'Media', 'Video', 'Era', 'You-tube', 'Primary School', 'Digital', 'Gaming', 'Understanding' and 'Multimedia'

The cases in the big data related to preparation for future education are as follow.

**[Case 6]** ... (Omitted) Nowadays, many people enjoy a game culture from infants to children, teenagers, and adults with smartphones that are easily accessible. There are many positive aspects, such as concentration, learning ability improvement, and challenging spirit, depending on how to use the game that used to be considered bad. The 2017 Game Literacy Teacher Job Training is a project sponsored by the Korea Contents Promotion Agency and sponsored by the Ministry of Culture, Sports and Tourism for the purpose of raising teachers' awareness of game culture and enhancing their capabilities to operate classes with each subject. (*Naver Blog, December 13, 2017: 2017 Game Literacy Teacher Job Training - Preparation for Future Education by utilizing Games*)

In the game, the collaboration between the head and limbs is vital, and it needs access to a complex text that stimulates various sensations such as visual and tactile senses. As there are many positive aspects in this game, if used well in future education, it can be an interesting medium to study.

[Case 7] KT (KT corporation) has improved the educational environment such as artificial intelligence software coding education, sports experience space using mixed reality (MR) technology, and content production support so that Daeseong-dong village primary school students can develop their dreams in the state-of-the-art education infrastructure... (Omitted) Students can train physical fitness regardless of fine dust or outside weather. The 'MR Screen Sports' provided in the school auditorium can perform 25 kinds of sports activities such as soccer, basketball, and boxing, and it is also possible to conduct simultaneous classes with other schools through the network. In addition, it supports 5G smartphone and 360-degree shooting for one-person media content production and supports a neckband-type camera called 'FITT 360 (Fit 360)'. Students are planning to create a content containing the story of Daeseong-dong village, where is the village with difficulties communicating with other cities or any other communities, and share it on social media such as YouTube to inform the peace message of Korea, the only divided country in the world. (*Naver News, June 27, 2019: Improving educational environment such as AI software coding training, MR sports experience space*)

It can be seen that 5G is installed in the primary school located in the DMZ (Demilitarized Zone) to improve the educational environment so that dreams can be developed in the state-of-the-art education infrastructure.

[Case 8] 'Book' Live Science is in the form of learning cartoons, making it easy to build and understand primary science knowledge.(Omitted)... In addition, multimedia videos on various topics are introduced with fun, and services such as 3D and 2D animation science videos are also provided. (*Naver Blog, November 18, 2018: Learning cartoons- Live Science Internet of Things -Fun Primary Science Book*)

In science books for primary school students, it can be seen that parents with children have a preference for books in which media education materials are combined, and it is confirmed that they are encouraging children's development through games and future education through cartoons.

### **Various factors related to expansion of future education program**

The key words are appeared with the node, Child, Student, Target, Operation, Experience, Class, Coding, Start, Parents, Summer Vacation, Progress, Program, News, Middle schooler, Teenager, English, Utilization etc.

The cases in the big data correlated with Various factors related to expansion of future education programs are below.

[Case 9]... (Omitted) There was a scratch challenge event by WCG on the theme of 'play of the future'. Scratch is a programming language for fostering children's creative thinking and systematic reasoning. It was created to learn coding. Unlike conventional text coding, a simple game or animation by connecting and coding the script like a block can be created. Korea also has a growing interest because coding is included in the

regular courses of primary school. (*Next News, July 21, 2019: What will the future play look like?*)

Coding, one of the future education programs, was involved in the regular curriculum, but it is being introduced to children as a fun way to learn so that they can naturally learn and enjoy future play.

[Case 10] ... (Omitted) Seoul Arts Foundation Seoul Arts Education Center held a cultural arts education festival, 'Arts Vacation,' which can be participated in by any citizens, including children, teenagers, and families, on the summer vacation. The main program of 'Arts and Vacations' is an art education experience in the form of a play created by six artists residing at the Seoul Arts Education Center Art Play LAB (Lab). These are three integrated art programs created by fusion of various genres such as visual arts, sound, and theater. The detailed programs include 'Moving Doremipasolasido', which uses a media device that sounds when focusing on color to play a space composed of various colors. (*Daum news, July 26, 2019: With summer vacation culture... 'Art and Vacation' 'Circus Family Camp'*)

As such, various experiences of future education programs are provided by the local community, and in particular, as media education and arts are presented as integrated art programs, various media education directions can be suggested.

[Case 11] During the summer vacation, Sejong City announced that it would conduct a task-oriented English camp to improve English conversation skills for all primary and middle school students. The Primary English Education Support Center (primary school) provides an English camp with an interesting topic that utilizes media for 4 hours a day from 9 am to 12:10 am, from 22nd to 26th of July. 36 students in 2 classes in 4th grade and 54 students in 3 classes in 5th to 6th grade participate in the English Camp. The English Camp for Junior High School students operates 4 classes with 18 advanced classes, 2 intermediate classes, 30 classes, and 14 basic classes, and the number of students is divided equally by schools, and selected by drawing lots among applicants. (*next news, July 29, 2019: Sejong Office of Education runs a summer vacation English camp for primary and junior high school students*)

It can be seen that various courses by regions are connected to media education to construct and operate an experiential program that considers students' interests. In addition, it can be seen that it is a popular program that many students want to experience, as the number of people is divided evenly by school and selected by lottery. As such, it is desperate to provide quality experience-based media education programs that students want to participate in.

### **Application to advanced classes**

The key word is appeared with the node, Teacher, School, High School, Middle School, English Tutoring, Mathematics, etc. The cases in the big data related to Application to advanced classes are below.

[Case 12] The Seoul Metropolitan Government prepared an experiential program for teenagers to spend a summer vacation making 'the hyper-connected DNA'. The sectors are diverse, such as IT science, art and culture, service, career and career, international, ecology and environment, history and society, sports, and others. In particular, during this summer vacation, the programs such as the 'Media Literacy' education program that

can help have the right perspective to read the times and information, the 'IT Science', 'Technology Convergence' program to learn and learn advanced technologies, and the 'Camp and Volunteer Activities' program to nurture creative personality are added...(Omitted)... In the media field, "Shooting the Start-up" will be opened for young people interested in starting and creating video contents. (*next news, July 26, 2019: If you hesitate, there's no room for you. the deadline will be pouring out for the summer vacation for youth experience!*)

As a vacation experience program for teenagers, they were providing programs to experience various fields such as IT science, arts, service, and sports, and to develop personal competencies. Especially, in the hyper-connected age, 'media literacy' education programs are increasing, so many teenagers can check the supply and demand for media education programs.

[Case 13] Now, the world with smartphones and the Internet has arrived. According to a recent survey by the Ministry of Gender Equality and Family, 200,000 Korean teenagers are at risk of Internet and smartphone addiction. The problem of various media addictions such as TV, internet, and games is now a matter of society as a whole. Is it the best way to ban viewing unconditionally from indiscriminate exposure of various media? In the new semester, we are trying to find a way to protect children from media addiction and educate them properly in a variety of media floods such as TV, Internet, ...(Omitted)...Today is the time that media must be actively utilized. (*Daum Cafe, August 23, 2016: Youth, how to protect yourself from media addiction?*)

Media in the present era is a mean of dialogue and communication between people, and it is an era in which media must be actively utilized. Since media and smartphones that are frequently used today are value-neutral, their importance may vary depending on who uses them and how. Therefore, through media and digital media education, media education should be conducted for all ages so as not to fall behind in the era of the fourth industrial revolution.

[Case 14] On July 26, the Sejong Special Self-governing City Office of Education announced that it developed an educational content distribution platform (smart-eye) in July, last year and applied it to the classrooms of front-line schools. Currently, a total of 5.8 million commercial contents are registered such as EBS video lectures and teaching and learning materials, for student learning, teacher teaching, and other related contents. These vast educational contents are being actively utilized in the classroom by displaying them on a smart electronic blackboard in accordance with the textbook units and chronologies of the corresponding grade at the click of the mouse with the teachers. The City Office of Education plans to add self-directed learning functions, where students self-diagnose online learning and develop correction strategies for each type. ...(Omitted)...In addition, one-click smart classes are also expected to be upgraded. The city office of education uses in-depth analysis of the textbooks of middle and high schools to utilize the smart eye system anywhere in Sejong City's first-line schools to overcome the limitations of not being able to share teaching and learning materials, because textbook publishers are different for each middle school and high school, unlike primary schools. Improvement measures were devised to prevent restrictions. In addition, education utilizing information technology from Sejong City, which is leading Korea's smart education, is also spreading across the country. (*Daum, April 3, 2015: Upgrading educational content distribution platform*)

In addition to large-scale online learning, we also prepare a tailored correction strategy for each type that provides multimedia content, so it is expected that the concentration of classes will be greatly improved by providing customized classes for individual students. Furthermore, it can be seen that online learning is not only limited to primary schools, but is also spreading and expanding to middle and high schools.

## 5. Result & Discussion

The purpose of this study was to confirm the social awareness of media education of Korean elementary school children created over the last five years through big data. It was also intended to derive social discourse contained in media education by conducting network and content analysis on social awareness. Specifically, big data consisting of Internet articles and blog posts related to social trends in media education for elementary school students was identified through text mining analysis.

Afterwards, scientific and objectivity was secured through analysis of semantic network of collected data, and content analysis was conducted by directly reviewing data after pre-processing and classifying it into four aspects of media education for elementary school students. The study, which explores major issues through social awareness of elementary school children through big data, suggested implications in more diverse aspects by revealing the social interest and perception of educational phenomena through a mixed research method.

The conclusions and significance of this study are as follows. First, as a result of analyzing big data to analyze the social perception and trends of primary media education, meaningful information about primary media education was extracted. First of all, the most frequently appeared keywords were "children, education, teachers, subjects, elementary schools, classes and students." In particular, as a result of semantic network analysis, "children, education, teachers, subjects, elementary schools, classes, and English tutoring" were the key keywords. Keywords with high proximity centrality appeared as "Destination, Elementary School, Media, Operation, Teenagers, Smartphones, English, and Coding," confirming the influence of smartphones. Keywords with high mediated center were "children, education, teachers, classes, students, utilization, programs, digital, and English."

These research results show that elementary school students are using smartphones or digital devices a lot, especially media education for English education or coding education [29, 36], so it is time to understand media as an educational and cultural environment and to further require critical media literacy education.

Applying various media to education in the field of education has now become a natural phenomenon, and the importance of media education is expected to continue to be emphasized more in the future. Utilizing these important factors of media education, such as immediate accessibility, knowledge scalability, and collaborative interaction, students will increase their ability to learn new knowledge by collecting, editing, and generating various information. Education using media has become more common in recent years, and considering the situation in which students are actively using the media as a customized self-directed learning method as well as elementary school class sites

[37], the ability to use the media is expected to draw attention as a more important core ability in the future [27].

Next, words such as education, elementary school, smartphone, YouTube, digital, media, and information appeared frequently. Through this, media and digital devices are actively used to educate elementary school students, and media utilization has become more common, especially as smartphones have become popular among elementary school students [21, 35]. In particular, it can be seen that various methods are being worked on at educational sites to acquire diverse information or to enhance problem-solving skills in order to enhance learning ability using media [34]. Also, words such as teachers, schools, middle schools, high schools, English extracurricular activities, and math education were frequently mentioned. In other words, it can be inferred that teachers are using media education to educate middle and high school students in English or math. Finally, words such as "future," "lecture," and "think" appeared frequently.

According to the study of [40], future media education is required considering the developmental characteristics of primary school students. In particular, it is revealed that the subjects of class need to pay close attention to how to solve the obstacles in class according to the level of development of the students. This means that in order to provide high-quality lectures to future primary school students, it is necessary to deeply understand the level of development of students and to provide lectures appropriate to the needs of students.

In addition, when media education is conducted in elementary school classrooms, the focus should be on interaction between teachers and students rather than focusing on media utilization that becomes educational media. According to a study by [40], since interactive communication positively affects students' learning attitude, it can be seen that the interaction between teachers and students is important when using media education mediums in class. In particular, it is suggested that teachers give careful guidance on the spot so that students can improve their ability to solve problems through deep thinking.

Second, in this study, CONCOR analysis was conducted to derive groups with appropriate levels of similarity, and four clusters were created. It was named 'Direction of future education in the era of the 4th industrial revolution', 'Preparation for future education', 'Various factors related to expansion of future education program', and 'Application to advanced classes' factor.

Presenting the direction of future education in the era of the Fourth Industrial Revolution, support is needed not only within the school but also within the community. According to the research results of [17], which analyzed the experience of participating in after-school media education programs in local communities, it is vital that all main players of school education such as teachers, students and parents need to have close communication and cooperation to operate and vitalize media education. In other words, content should open the world and strengthen the ability to live together through education that draws empathy through emotion.

However, on the other hand, just as the encounter with game addiction or cybercrime hinders children's healthy growth, how the media is used has a great influence on the psychosocial development of children and adolescents [14, 16]. Therefore, Ethical education for Internet ethics is needed to solve social problems such as cyberbullying.

In order to prepare for future education, it was confirmed that various programs such as future education using play, AI, MR content education, and multimedia media platform were requested to be expanded and presented. These research results show that elementary school students are using smartphones or digital devices a lot, especially media education for English education or coding education, so it is time to understand media as an educational and cultural environment and to further require critical media literacy education. In the study of [2], the cutting-edge educational cultural environment was effective in enhancing learners' academic performance. In addition, it was reported that learners' spontaneous learning motivation was improved by introducing and activating various learning strategies and core educational technologies in the educational field. Moreover, it is now natural to apply various media to education in the field of education, and the importance of media education will continue to be emphasized more in the future.

Using these important factors of media education, such as immediate accessibility, knowledge scalability, and collaborative interaction, students will increase their ability to learn new knowledge by collecting, editing, and generating various information. Education using media has become more common in recent years, and even considering the situation in which students are actively using the media as a customized self-directed learning method as well as elementary school class sites, the ability to use the media is expected to draw attention as a more important core ability in the future.

## 6. Conclusion

This study is meaningful in that it suggested basic information and materials to prepare a plan for revitalizing media education for primary school students by analyzing social discussions of media education through big data collected various channels. Moreover, to analyze the social discussion of media education, a mixed methodology using both quantitative and qualitative research methods was applied. The use of hybrid methodology enabled to have in-depth insight and understanding of current status [9, 18].

In Korea, there have been some prior researches conducted in relation to the perception and discussion of media education using big data [6, 14, 20, 30, 39]. However, it can be seen that there is a lack of research that examines the general perception of media education, including media education, as the main focus is on the development of programs for media education and research on improving attitudes. Moreover, media education research for primary school students has not been conducted so far.

And it is difficult to find a study that has both quantitative and qualitative studies. Therefore, it is different from previous studies in that it uses big data to conduct quantitative study for recognizing social perception of media education and this study is isolated since it finds the context in the qualitative studies, which was not found in the quantitative studies.

Furthermore, the fact that this study shows concrete clusters of social perception of media education for primary school students through Concor analysis and it presents educational implications make this study more isolated from previous studies.

Presenting implications and suggestions based on these conclusions is as follows. First, when media education is conducted at primary school sites, the focus should be on interaction between teachers and students, rather than focusing only on the media utilization that becomes the educational medium. In particular, it is suggested that teachers give careful guidance on the spot so that students can improve their ability to solve problems through deep thinking.

Second, from the time of elementary school, we should continue to strengthen our educational efforts on the use of smart media and the correct attitude and ethical norms of activities in the world of smart media, while increasing our ability to control smart media rather than being subordinate to smart media, so that we can have a more positive attitude and belief.

Finally, from the time of elementary school, we should continue to strengthen our educational efforts on the use of smart media and the correct attitude and ethical norms of activities in the world of smart media, while increasing our ability to control smart media instead of being subordinate to smart media, so that we can have a more positive attitude and belief.

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