

## A Network Analysis of Early Childhood Teachers' Happiness based on Big Data<sup>\*</sup>

Hwang, Hae-Ik<sup>\*\*</sup> · Lee, Kang-Hoon<sup>\*\*\*</sup>

### Abstract

This study aims to investigate early childhood teachers' happiness through network analysis, to provide basic data for promoting happiness of early childhood teachers. For this purpose, data were collected by the keywords 'happiness + daycare teacher', 'happiness + kindergarten teacher' with big data Textom. Based on the frequency of the words, 50 words were selected after the first and second filtering processes, which were converted to 1-mode(nodelist1) matrix data. The results of this research were as follows: Happiness of daycare teachers and early childhood teachers have a common relation to 'children', 'director', 'teacher', 'parents', 'education center', 'culture', 'process', and 'support'. In addition, while 'happiness + daycare teacher' include 'welfare', 'policy', and 'service', 'happiness + early childhood teacher' include 'characteristic', 'competency', 'satisfy', and 'meaning'. It also showed that happiness of early childhood teachers have closely related to interpersonal relationship, working environment, government policy, psychological and social Attitudes. Based on these analytical results, the researcher suggested ways to support early childhood teachers' happiness.

*Keywords : big data, early childhood teacher, happiness, network analysis*

---

<sup>\*</sup> The Korean version of this article was presented at the Fall Conference Document of the Korea Open Association for Early Childhood Education, pp. 689-719, 2017.

<sup>\*\*</sup> Professor, Department of early childhood education, Pusan National University

<sup>\*\*\*</sup> Doctoral candidate, Department of early childhood education, Pusan National University / Corresponding author, darkengal@nate.com

## I . Introduction

### 1. Purpose and Necessity of the Study

Recently, the Ministry of Education has implemented a free semester system in order to develop a dream, find talent, and has opened a site for additional guidance(Ministry of Education, 2017). What is especially striking is that this free semester system is not the only policy to support a students' happy life. In this video, the copy of 'Teacher is happy because student is happy' implies that teachers' happiness can not be separated from students' happiness and teachers' happiness is as important as students' happiness. There are many discussions about the happiness of the members, not only in the free semester system but also in the innovation schools. Although there are different names in different regions, teachers are making various efforts to create a happy school. In particular, the case of a public elementary school in G Province in South Korea, where "experiment to eliminate school affairs at school" that focuses only on teaching lessons to teachers, is approaching with fresh impact. In order to reduce the workload of teachers, the school divides the 'education head-teacher' and 'research head-teacher' into 'happiness management head-teacher' and 'happiness supporter head-teacher'. As a result, the principal found the teacher who was sitting at the desk and concentrating on the curriculum operation as in the free semester video. Therefore teacher started to have smile instead of making difficulty curriculum(Happiness Education, 2017).

So is teachers' happiness important only to teachers who teach children after school age? According to previous researches(Bae, 2009; Hwang, 2013), it is reported that teachers' happiness is an important factor for children future lifespan. In particular, the behavior and attitude of early childhood teachers may have a profound effect on young children in that they are sensitive periods of emotional development(Kim, 2013). In addition, infants who stay long time in the early childhood education institutes need the developmental characteristics and they are sensitive of environment. The happiness variables of the teacher can be an important factor to the parents' happiness variables through well educated children in institutes(Hwang & Lee, 2017). Therefore, it is necessary for the early childhood happiness education to guarantee the happy teaching career of early childhood teachers(Hwang & Lee, 2017).

The definition of happiness can be defined variously according to the academic system. Happiness in early childhood education is a process of finding the actual situation of young children, and the aim of early childhood education(Hwang, 2013). In addition, happiness for early childhood teachers can be defined as training positive emotions by forming a positive relationship between organizational members based on autonomy and engaging in organization and teaching activities

(Hwang, Kang, & Tak, 2014; Hwang & Lee, 2017; Peterson & Seligman, 2004). In other words, happy of early childhood teachers recognizes life more positive and can cope well with stress with high resilience. Also, they focus well in their own duties and organizations(Csikszentmihalyi, 1990/2004). They literally have high job satisfaction also be passionate about young children(Hwang, 2013). Recently, I have been paying more attention to flourishing, which means continuous and prosperous life by pursuing well-being beyond happiness, focusing on temporary feelings or situations such as life satisfaction or positive emotion(Hwang & Lee, 2017). This can be explained through PERMA(Positive Emotion, Engagement, Meaning, Relationship, Achievement)(Seligman, 2011), and positive psychologists believe that this happiness can be determined by individual efforts(40%) besides hereditary(50%) and environment(10%)(Woo, 2016; Seligman, 2004/2014). This implies that happiness of early childhood teachers can be promoted by the effort, and it is important to examine what factors influence early childhood teachers' happiness. According to previous researches(Lee, Yoon, & Byeon, 2016) trend of happiness on early childhood teachers, happiness of early childhood teachers was explained with socio-demographic variables(age, education, employment, etc.), social psychological variables(relationships between young children, fellow teachers, parents, and directors, etc), and job-related variables(directors' leadership, ego-resilience, teacher efficacy, teaching flow, organizational commitment, etc.). In particular, previous studies on job-related variables showed that ego-resilience and teacher efficacy increased as early childhood teachers perceived director' leadership positively, and positively influenced the performance of happy teaching career by promoting teaching flow, organizational commitment(Hwang & Lee, 2017). In addition, teachers with high euphoria showed a linear trend on recognition of job satisfaction as well as teacher efficacy(Hwang, 2013). Therefore, it would be meaningful to explore the factors, which are influencing happiness of early childhood teachers and to promote them.

As mentioned above, happiness of early childhood teachers are not limited to positive emotions of the individual, but they are satisfied with their teaching career through positive relationships with various members of early childhood education institutions and healthy organization culture. Especially, since the time for infants to stay in early childhood education centers is increasing, happiness of early childhood teachers is not related to the quality of early childhood education(Kim & Choi, 2017; Hwang & Lee, 2017). However, the researches so far have mostly been conducted through surveys or interviews with early childhood teachers(Lee, Yoon, & Byeon, 2016), there has been a limit in that happiness of early childhood teachers was explained only at the individual level or from the academic viewpoint of a specific group. In addition, many of the early childhood teachers' happiness - related researches were conducted as quantitative research methods based on the parametric statistics, which could be effective in generalizing the research results(Song, 2014),

but limited in understanding various opinions, social awareness and emotions of the general public(Kim & Kim, 2016). In this way, looking at happiness of early childhood teachers through big data will help to understand how social perception is formed as a social environment system for early childhood teachers' happiness. Looking at happiness of early childhood teachers through big data, which is an aggregation of collective intelligence, rather than analyzing the collected data with a specific purpose in advance, helps to understand how the early childhood teachers' social perception is formed give.

Therefore, this study aims to investigate early childhood teachers' happiness through network analysis, to provide basic data for promoting young children' happiness. This study can confirm whether the social perceptions of the happiness of 'child care teachers' and 'kindergarten teachers' doing similar tasks differ according to the binary administrative system of teacher management. Especially, the characteristics and structure of social awareness of happiness of early childhood teachers can be grasped(Hwang, Kim, & Kim, 2014; Oh & Kim, 2016). Ultimately, it is expected that it will help establish a differentiation strategy for different types of institutions in order to raise social interest in happiness of early childhood teachers and to provide a plan for supporting the happy teaching career of early childhood teachers.

The research problems set up to achieve the purpose of the research are as follows.

- 1) What is the social awareness of daycare teachers' happiness through the Big Data?
- 2) What is the social awareness of kindergarten teachers' happiness through Big Data?

## II. Methods

### 1. Data

The data of this study was collected from web data of two domestic portal sites and one foreign portal site among the big data provided by Textom. The data was collected over the last year from August 27, 2016 to August 27, 2017 through various channels on popular portal sites. The raw data collected mainly the keywords related to 'daycare teacher + happiness' and 'kindergarten teacher + happiness'. Those data includes 2,181 web pages, 869 blogs, 271 news, 245 cafes, 278 'Intellectual' services, 2,010 images, 195 videos, 328 articles, 262 articles, 62 research reports, Facebook has 22 large nodes (Node = 7,292) data(Lee, 2013).

## 2. Tools Used

To collect and refine data on happiness of early childhood teachers, we used the Big Data analysis solution Textom, developed by IMC. Network analysis of the collected data was carried out using UCINET ver. 6.636(Freeman, 1979), which provides various types of network analysis as freeware.

## 3. Data analysis Methods and Procedures

### 1) Refinement the collected Data and Generate Matrix Data

The raw data collected from Textom were subjected to data analysis and data cleaning for a clear meaning interpretation of the study results(Lee 2013). The first refining process began with raw data collection. Text mining was performed mainly on nouns. We also removed the data that was not relevant to the purpose of the study, using Textom's 'Quick Edit' function. Keywords that are not appropriate due to parts of speech, synonyms, singular and plural, spacing, symbols, numbers, and alphabets are partially revised. For the second purification, the data of the first purification and the result on the extraction of the secondary frequency of the extracted word were downloaded as an Excel file. The data was refined by the function of 'Find and Replace'. Based on the frequency analysis results, we extracted the top 50 keywords for network analysis. If the keyword is not the key keyword in the first refined data, it is deleted from the node list for network analysis. Based on the final refined data and extracted word frequency analysis, we extracted the top 50 keywords. Then,  $50 \times 50$  1-mode(nodelist1) frequency matrix data was generated around 50 nodes extracted by Textom's matrix conversion function.

### 2) Network Analysis

UCINET which is easy to integrate with NetDraw is used for network analysis(Kim & Kim, 2016). To examine the multiple cohesion measures, we looked at the cohesion of the data such as node, density, average distance, number of components, and diameter(Lee, 2013). Also, the degree centrality, closeess centrality, betweenness centrality, and eigenvector centrality of the network is analyzed to identify the structural location characteristics among the nodes in the network.

### 3) Network Visualization

The NetDraw Program was utilized to visualize the networks analysed with UCINET 6(Kim & Kim, 2016).

#### 4. Data processing and Analysis

This study utilized Textom and Excel 2014 program, a big data analysis solution, to examine the social perceptions of early childhood teachers' happiness through network analysis using Big Data. Data on happiness of early childhood teachers were collected primary and secondary refinements were conducted using text mining method. Frequency analysis was performed based on the data after data cleaning. Based on the frequency analysis results, the top 50 nodes were selected and a  $50 \times 50$  1-mode (nodelist1) frequency matrix data set was created. The network analysis is divided into two levels (microscopic and macroscopic) according to the analysis criteria suggested by Lee(2013). The procedure is as follows. First, we analyzed network attributes such as number of nodes, density, average connection distance, number of components, diameter, and network concentration at the marco level to grasp the overall characteristics of the network. Second, we conducted a one-sample mean test using the bootstrapping technique in the UCINET6 program to test statistical significance. Third, to examine the characteristics of the nodes included in the network, we analyzed the centrality(degree, closeess, betweenness, and eigenvector) that represent the influence of each node at the micro level. We also looked at network structure through visualization of network using NetDraw program(Kim & Kim, 2016).

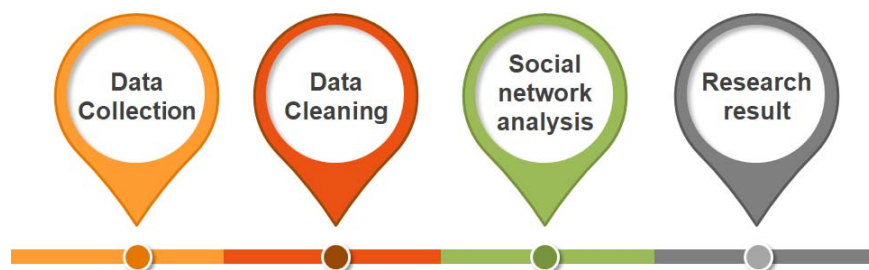


Fig 1. Procedure of network analysis

### III. Results

#### 1. The social awareness of daycare teachers' happiness

##### 1) Frequency Analysis of daycare teachers' happiness

As a result of big data analysis using Textom, a big data analysis solution, 5,479 keywords were

extracted and the analysis nodes were selected based on the top 50 keywords with frequency. Table 1 shows the frequency analysis results of the selected keywords.

Table 1. Frequency Analysis of daycare Teachers' Happiness (Top 50 Keywords)

Rank	Keyword	N	Rank	Keyword	N	Rank	Keyword	N	Rank	Keyword	N	Rank	Keyword	N
1	Daycare	3,614	11	Support	383	21	Kindergarten	203	31	Forever	165	41	Seoul	147
2	Teacher	3,529	12	Grades	379	22	Culture	198	32	Country	165	42	Parenting	142
3	Happiness	2,481	13	Hire	346	23	Work	197	33	School	163	43	Process	141
4	Daycare Center	965	14	Acquisition	313	24	World	182	34	Parents	163	44	Foundation	131
5	Education	784	15	Center	304	25	Home	178	35	Child	162	45	Transfer	130
6	Welfare	760	16	Time	276	26	Research	177	36	Educational Personnel	158	46	University	129
7	Children	745	17	Recruitment	273	27	Environment	172	37	Improving	155	47	Mom	129
8	Society	736	18	Information	265	28	Director	171	38	Business	153	48	Agency	122
9	Certification	703	19	Policy	245	29	Employment	170	39	College	148	49	Bachelor	122
10	Kid	405	20	Young Children	228	30	Job Offer	167	40	Operation	147	50	Service	119

As a result of the frequency analysis of happiness of daycare teachers, the highest frequency of Daycare(3,614) was followed by Teachers(3,429), Happiness(2,481), Daycare center(965), Education(784), Welfare(760) Children(745), Society(736), Certification(703), and Kid(405). Among the top 50 keywords for daycare teachers' happiness, the most notable keywords were Relationship with Members, Work Environment, and Government Policy.

## 2) Network analysis of daycare teacher' happiness

### (1) Analysis of macro level of network for daycare teachers' happiness

According to the analysis of the network macro level of happiness of daycare teachers, the network structure of daycare teachers' happiness is shown in Figure 2.

The results of the analysis of the structural attributes of the network for happiness of daycare teachers showed that the density was .870, the average distance was 42.640, the number of components was 1, the diameter was 2, network centralization was 7.913%.

### (2) A statistical significance test of network for daycare teachers' happiness

As a result of testing the statistical significance of the network for happiness of daycare teachers using the bootstrap technique, the sampling distribution average of the network data(mean of

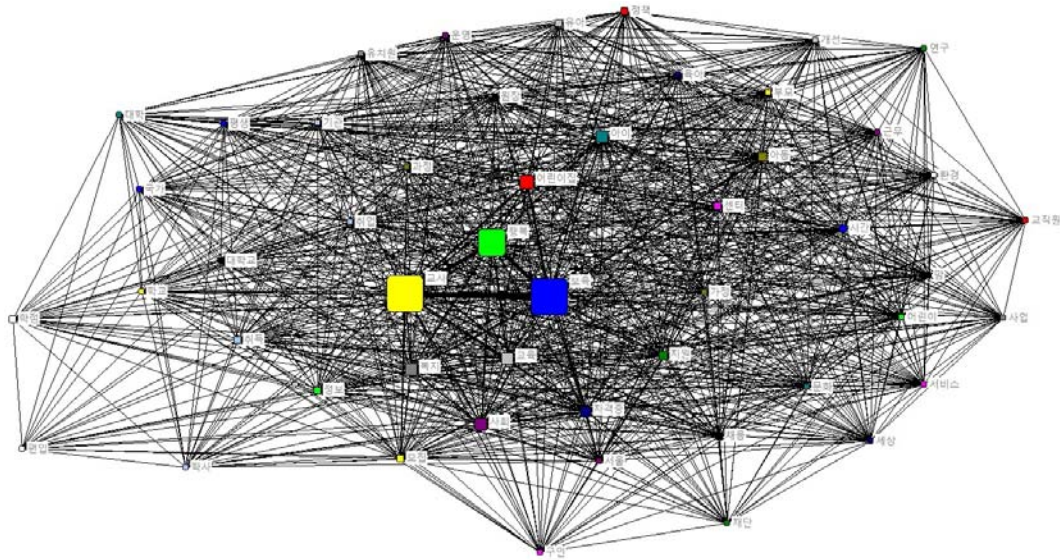


Fig 2. Network structure of daycare teachers' happiness

sample mean) was 77.9788 and standard error(standard deviation of sample mean) was 21.6986. As a result of calculating the Z-score,  $Z = 3.5911$ , the probability that the network data of daycare teachers' happiness showed a larger absolute value than the Z-score was 0.0020, and the relationship between the network data at the significance level of 5%.

### (3) Analysis of micro level of network for daycare teachers' happiness

In order to examine the micro level of the network of daycare teachers' happiness, we conducted a centrality and power analysis. The results are shown in Table 2.

The centrality(degree, closeess, betweenness, and eigenvector) of daycare teachers' happiness is presented by the analysis of the top 20 keywords, and the standardized values are used so that those can be compared even in different size networks. The centrality analysis results were similar to the frequency analysis results. In addition, when the results of centrality analysis are summarized, welfare, society, and certification are commonly included in frequency analysis, degree centrality, closeess centrality, betweenness centrality, and eigenvector centrality. This implies that the social awareness of daycare teachers' happiness is mainly dealt with in relation to Government Policy.



Table 2. Centurality Analysis of daycare Teachers' Happiness (Top 20 Keywords)

Rank	Keyword	NrmDgree	Closeness	nBetwiness	Eigenvector	Rank	Keyword	NrmDgree	Closeness	nBetwiness	Eigenvector
1	Daycare	8.96	Daycare 1.00	Daycare .51	Daycare .55	11	Children	1.04	Employment .99	Support .45	Children .07
2	Teacher	8.77	Teacher 1.00	Teacher .51	Teacher .55	12	Recruitment	1.01	Kid .98	Information .42	Support .07
3	Happiness	6.14	Happiness 1.00	Happiness .51	Happiness .43	13	Support	.98	Information .98	Recruitment .40	Recruitment .06
4	Daycare Center	2.61	Education 1.00	Education .51	Daycare Center .20	14	Acquisition	.97	Director .98	Daycare Center .37	Center .06
5	Certification	2.15	Welfare 1.00	Welfare .51	Kid .16	15	Information	.93	Seoul .98	University .33	Time .06
6	Welfare	2.08	Society 1.00	Society .51	Education .13	16	Center	.90	Recruitment .96	Director .33	Policy .05
7	Kid	2.05	Certification 1.00	Certification .51	Certification .12	17	Culture	.84	Home .96	Acquisition .32	Information .05
8	Society	1.99	Process 1.00	Process .51	Welfare .11	18	Time	.78	Children .95	Home .31	Acquisition .05
9	Education	1.98	Daycare Center .99	Employment .49	Society .11	19	Job Offer	.75	Hire .95	Agency .30	Environment .04
10	Hire	1.33	Support .99	Seoul .47	Employment .08	20	World	.75	Center .95	Forever .30	Culture .04

## 2. The social awareness of kindergarten teachers' happiness

### 1) Frequency Analysis of kindergarten teachers' happiness

As a result of big data analysis using Textom, a big data analysis solution, 4,174 keywords were extracted and the analysis nodes were selected based on the top 50 keywords with frequency. Table 3 shows the frequency analysis results of the selected keywords.

Table 3. Frequency Analysis of kindergarten Teachers' Happiness (Top 50 Keywords)

Rank	Keyword	N	Rank	Keyword	N	Rank	Keyword	N	Rank	Keyword	N	Rank	Keyword	N
1	Young Children	1,691	11	Daycare Center	146	21	Training	102	31	Evaluation	84	41	Time	69
2	Teacher	1,459	12	Book	141	22	University	99	32	Mutual	77	42	Children	69
3	Education	1,255	13	Daycare	132	23	Relationship	98	33	Character	77	43	Director	68
4	Happiness	1,125	14	Parents	130	24	Cultivation	90	34	Competency	75	44	Important	67
5	Research	717	15	Job	119	25	Recognition	89	35	Satisfaction	74	45	Select	66
6	Kindergarten	332	16	Elementary	119	26	Support	89	36	Life	73	46	Plan	65
7	Kid	214	17	Program	114	27	Need	88	37	Disability	73	47	School Parent	65
8	Process	186	18	English	110	28	Mom	87	38	Culture	72	48	Agency	65
9	Society	175	19	Theory	105	29	Forest	85	39	Activity	72	49	School Teacher	65
10	School	157	20	Korea	102	30	Development	84	40	Planning	70	50	meaning	64

As a result of the frequency analysis of the happiness of the kindergarten teachers, the highest frequency of Young Children(1,691) was followed by Teachers(1,459), Education(1,255), Happiness

(1,125), Research(717), Kindergarten(332), Kid(214) Process(186), Society(175), and School (157). Among the top 50 keywords for kindergarten teachers' happiness, the most notable keywords were Relationship with Members, Work Environment, Government Policy, and Psychological & Sociological Characteristics.

## 2) Network analysis of kindergarten teacher' happiness

### (1) Analysis of macro level of network for kindergarten teachers' happiness

According to the analysis of the network macro level of happiness of kindergarten teachers, the network structure of kindergarten teachers' happiness is shown in Figure 3.

The results of the analysis of the structural attributes of the network for the happiness of kindergarten teachers showed that the density was .733, the average distance was 35.920, the number of components was 1, the diameter was 2, network centralization was 9.738%.

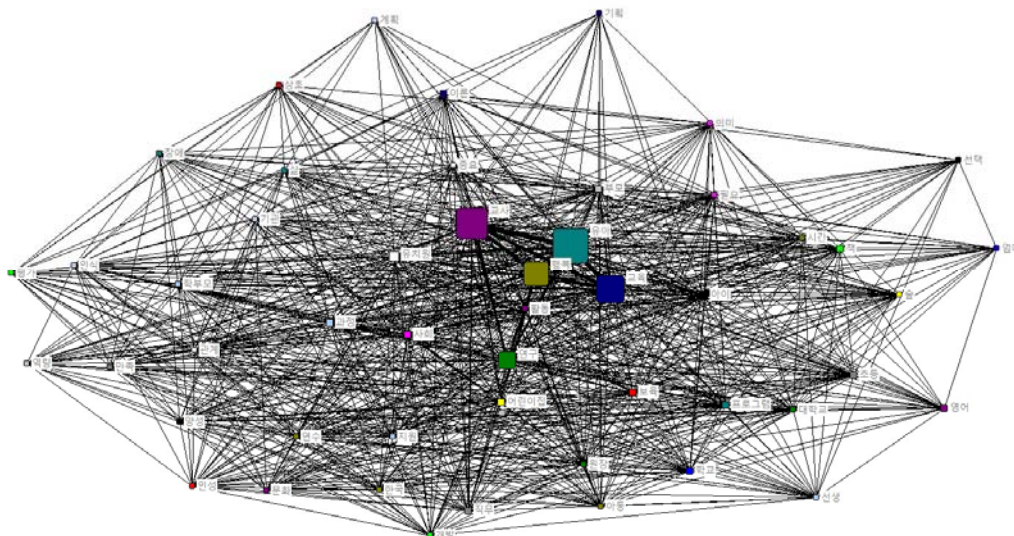


Fig 3. Network structure of kindergarten teachers' happiness

### (2) A statistical significance test of network for kindergarten teachers' happiness

As a result of testing the statistical significance of the network for the happiness of the kindergarten teachers using the bootstrap technique, the sampling distribution average of the network data(mean of sample mean) was 33.7257 and standard error(standard deviation of sample mean) was 10.3947. As a result of calculating the Z-score,  $Z = 3.2394$ , the probability that the network data of kindergarten teachers' happiness showed a larger absolute value than the Z-score

was 0.0044, and the relationship between the network data at the significance level of 5%.

(3) Analysis of micro level of network for kindergarten teachers' happiness

In order to examine the micro level of the network of kindergarten teachers' happiness, we conducted a centrality and power analysis. The results are shown in Table 4.

Table 4. Centrality Analysis of kindergarten Teachers' Happiness (Top 20 Keywords)

Rank	NrmDgree		Closeness		nBetweeness		Eigenvector		Rank	NrmDgree		Closeness		nBetweeness		Eigenvector	
1	Young Children	10.99	Young Children	1.00	Young Children	1.52	Young Children	.52	11	Training	.96	Daycare Center	.94	Society	.89	Training	.05
2	Teacher	9.58	Teacher	1.00	Teacher	1.52	Teacher	.48	12	Daycare Center	.95	Parents	.94	Daycare Center	.79	Parents	.05
3	Education	8.48	Education	1.00	Education	1.52	Education	.42	13	Parents	.91	program	.91	Life	.76	Relationship	.05
4	Happiness	7.63	Happiness	1.00	Happiness	1.52	Happiness	.41	14	Korea	.88	Training	.89	Important	.74	Korea	.04
5	Research	4.72	Kindergarten	.99	Kid	1.31	Research	.23	15	Relationship	.87	Support	.89	Daycare Center	.72	Daycare Center	.04
6	Kindergarten	2.69	Kid	.98	Kindergarten	1.29	Kindergarten	.14	16	Program	.86	School	.88	Program	.68	Daycare	.04
7	Process	1.41	Research	.96	Activity	1.12	Process	.07	17	Daycare	.85	Korea	.88	Training	.54	Development	.04
8	Society	1.19	Society	.96	Research	1.11	Society	.06	18	Development	.84	Relationship	.88	Time	.54	School	.04
9	Job	1.13	Process	.95	Parents	1.03	Kid	.06	19	School	.82	University	.87	School Parent	.52	University	.04
10	Kid	1.11	Daycare Center	.94	Process	.92	Job	.06	20	Theory	.73	Need	.87	Support	.48	Program	.03

The centrality(degree, closeess, betweenness, and eigenvector) of kindergarten teachers' happiness is presented by the analysis of the top 20 keywords, and the standardized values are used so that they can be compared even in different size networks. The centrality analysis results were similar to the frequency analysis results. In addition, when the results of centrality analysis are summarized, young children, education, researcher, and process are commonly included in frequency analysis, degree centrality, closeess centrality, betweenness centrality, and eigenvector centrality. This implies that the social awareness of kindergarten teachers' happiness is mainly dealt with in relation to Government Policy, and evaluation criteria that should be considered important to be happy.

## IV. Discussion and Conclusion

The purpose of this study is to provide basic data to support happiness of early childhood teachers by examining social awareness of early childhood teachers' happiness through network

analysis with Big Data. The results of this study are as follows.

First, as a result of frequency analysis using the keyword ‘happiness + daycare teacher’, daycare showed the highest frequency, followed by teacher, happiness, daycare center, education, welfare, children, society, certification, and kid. This implies that the social perception of daycare teachers' happiness is closely related to the daycare center's physical environment. It can be seen that organizational culture and organizational climate have an effect on happiness of daycare teachers(Lee & Lee, 2016). In order to promote the happiness of child care teachers, it is necessary to improve the social awareness and the social welfare on the teacher education(Bae, 2009). Therefore, it is suggested that efforts to improve psychological welfare need to be made by improving low pay, long working hours, poor working conditions, and reducing job stress(Hwang & Lee, 2017).

The analysis of the centrality in order to examine the micro level of the network on daycare teachers' happiness showed similar pattern to the frequency analysis results. Social welfare, society, and certification were the key keywords in centrality(degree, closeess, betweenness, and eigenvector) except for child care, teacher, and happiness directly mentioned in search keywords. This is supported by the previous study(Lee, 2011) that the welfare satisfaction should be a sub-factor explaining job satisfaction as a determinant of daycare teacher' happiness. This is consistent with Kim & Choi(2017)'s view that teachers' qualifications should be examined as a factor explaining happiness of early childhood teachers. Also, a factor explaining the happiness of the daycare teacher, social awareness can affect factors that explain happiness such as stress and satisfaction(Bae, 2009; Lee & Hwang, 2016). This result take context with Lee & Lee(2016) that the social support environment is important for the daycare teacher. Therefore, it is necessary to prepare for improving the working environment and effective treatment of daycare centers. In addition, it is necessary to strengthen the qualification standards so that the teachers can improve the social awareness of the daycare teachers and nurture the expertise by themselves. It need reinforcement for the qualification standards so that daycare teachers can feel the competence through the raising of daycare professionalism, along with efforts to improve social awareness of daycare teachers. In addition, it is necessary to strengthen the eligibility criteria so that the daycare teachers themselves can feel the competence through the nurturing of the daycare professional.

Second, as a result of frequency analysis using the keyword ‘happiness + kindergarten teacher’, young children was the highest frequency, followed by teacher, education, happiness, research, kindergarten, kid, process, society, and school.

This result show that the social awareness of the kindergarten teacher' happiness is explained from the positive relationship among the frequent interaction members in the kindergarten such as the young children, the director, and the fellow teacher. This result suggests that positive

relationships between kindergarten teachers' infant and fellow teachers can not only help to reduce job stress but also can reach happiness by actively engaging in organization. This suggests that positive relationships(Kim & Choi, 2017; Oh & Kim, 2015) between young children and fellow teachers not only help reduce job stress(Lee & Lee, 2016) but also can lead to happiness by actively engaging in the organization(Ryu, 2016). This kind of happiness can have a positive effect on interpersonal relationships, so that we can expect more positive relationships such as dedication and immersion to show responsibility(Ryff, 1989). Compared with the daycare teacher, it is evaluated as being treated better, but the level of treatment is still lower than other teaching professions(Ryu, 2016). In order to support the happy teaching career of kindergarten teachers, it is urgent to establish a social support base in addition to the effort to improve social awareness of kindergarten teachers from an ecological point of view(Oh & Kim, 2015).

The analysis of the centrality to examine the micro level of the network with kindergarten teachers' happiness showed similar pattern to the frequency analysis results. Education, research, and process were the key keywords in centrality(degree, closeess, betweenness, and eigenvector) except for young children, teacher, and happiness directly mentioned in search keywords. Positive interaction between kindergarten teachers and young children can't reduces all emotional labor(Kim, 2016), but it promotes ego-resilience and teacher efficacy by promoting happiness(Kim & Choi, 2017). In addition, teachers experience the desire of self-realization in the process of communicating with people around them, and they can contribute to happiness by experiencing positive process(Oh & Kim, 2015) as well as contributing to recognition of their teaching profession happily(Ryu, 2016). Therefore, at the government level, various researches and efforts need to reduce the stress situation in the course of teaching profession and to support the happy teaching career through the reduction of teachers' work and improvement of treatment. It also suggests that it is important for teachers to have an opportunity to perceive how happy they are by engaging in teacher education on the theme of happiness or recalling a happy experience on a personal level.

In sum, While social awareness of daycare teachers' happiness was mainly focused on improving the work environment and government policy projects such as social welfare services, Social awareness about the happiness of kindergarten teachers was mainly dealt with about the organizational culture, job training and social support. Especially, in the social awareness about the happiness of kindergarten teachers, the happiness and differentiation of the daycare teachers were more sensitive to the relationship between the children who interact with each other in the early childhood education institutes such as the child, the director, the teacher, and the parents. In addition, it was recognized that the satisfaction of the job by giving the positive personality and professional competence and positive meaning to the teaching profession was happiness of early

childhood teachers. This is supported by the results of Oh & Kim(2016)'s study that there is a difference in perceiving happiness according to the type of work organization of early childhood teachers. The reason for this can be found from the fact that daycare teachers perform a lot more than kindergarten teachers and have more overtime work but they have low wage so need improvement of labor condition(Lee & Hwang, 2016). In addition, in the study analyzing the conceptual map of happiness education(Hwang, Kim, & Kim, 2014), the early childhood teachers supported the result that the positive relation between the teacher and the young children became the upper concept together with pleasure in the kindergarten while the emotional support or positive attitude was the upper concept in the daycare center. Therefore, it is necessary to recognize that there is a specificity according to the type of institution in the development of a plan to support the happy teaching life for the early childhood teachers and the development of the teacher education program.

Third, as a result of the frequency analysis based on the words extracted from the keywords on happiness of the daycare teachers and the kindergarten teachers, the contents related to the relationship between the members such as the young child, the director, the teacher with the parents, Environment, and support. These results suggest that the social awareness of the early childhood teachers' happiness can be formed based on the positive relationship, and it is essential to have a good relationship with the infant, the director, the fellow teacher, and the parents for the happy teaching career(Ryff, 1989; Seligman, 2011). In order to make a happy organizational culture of early childhood education institutions, it was necessary to support job training such as upgrading training and maintenance training so that the volunteers could actively and professionally demonstrate their expertise(Bae, 2009; Han, 2016). On the other hand, it was required to improve the low social awareness of early childhood teachers and to provide diverse support plan for the government to solve prejudices and stereotypes about early childhood teachers. This study complements the bias from over-generalization of the results on the analysis by using the Big Data to analyze the social perception of happiness of early childhood teachers in general. In addition, it is significant that the researchers' insight helped to understand the social perception on happiness of early childhood teachers by analyzing key keywords(Kim, 2016; Lee, 2017). Based on these results, it is expected that there will be various plans to support early childhood teachers' teaching career by bringing attention to happiness of early childhood teachers.

Based on these discussions, suggestions for future research are as follows.

First, this study has not been able to confirm the change of social perception according to the generation time of data. The analysis is based on the published web data of the last one year. Therefore, it is expected that research will be conducted to investigate the change of social

awareness of early childhood teachers' happiness from the 2000s when the study of happiness began to increase rapidly (Lee, Yoon, & Byeon, 2016). Second, the analysis of this big data may not enough explanation about how the data was generated. In order to examine the perception of happiness of early childhood teachers, the network data of the early childhood teachers' response data and compare it with the results using the big data. Third, Interpretation was done by the researchers' insights based on the keywords displayed through the Big Data. Therefore, it is limited to grasp the concept of happiness of the early childhood teachers in depth. Future researches need to investigate tacit knowledge about actual child teachers and qualitative research through in-depth interview.

## References

- Bae, S. H. (2009). The Effect of the Happiness of childcare teacher on teacher's efficacy and job satisfaction. *Busan Journal of Educational Research*, 22, 25-44.
- Csikszentmihalyi, M. (2004). *Flow: The psychology of optimal experience*. (I. S. Choi, Trans.). Seoul: Hanulim. (Original work published 1990)
- Freeman, L. C. (1979). Centrality in social networks conceptual clarification. *Social Networks*, 1(3), 215-239.
- Han, J. H. (2016). The impact of teachers' empowerment on happiness in child-care teachers. *The Journal of Korea Open Association for Early Childhood Education*, 21(4), 77-95.
- Happiness Education. (2017, July, 20). *Experiment to eliminate school affairs at school*. Retrieved from [https://m.facebook.com/story.php?story\\_fbid=202629550217074&id=100014100917393](https://m.facebook.com/story.php?story_fbid=202629550217074&id=100014100917393)
- Hwang, H. I. (2013). The mediating effect of job satisfaction on the relationship between happiness and teacher efficacy in early childhood teachers. *The Journal of Eco Early Childhood Education & Care*, 12(2), 157-180.
- Hwang, H. I., Kang, H. M., & Tak, J. H. (2014). The meditating effect of positive thoughts on the relationship between humor and happiness in early childhood teachers. *Early Childhood Education Research & Review*, 18(1), 341-363.
- Hwang, H. I., Kim, M. J., & Kim, B. M. (2014). Analysis of conceptual diagrams of education for happiness among early childhood teachers. *Journal of Korean Child Care and Education*, 10(1), 59-79.
- Hwang, H. I., & Lee, K. H. (2017). The meditating effect of teaching flow, organization commitment on the relationship between director's servant leadership perceived by teachers and

- flourishing in kindergarten teachers. *Korean Journal of Early Childhood Education*, 37(5), 79-104.
- Kim, D. R. (2016). A study on the emotional labor experienced by kindergarten teachers. *The Journal of Eco Early Childhood Education & Care*, 15(4), 219-248.
- Kim, S. R., & Choi, I. S. (2017). The effects of kindergarten teachers' happiness on ego resilience and teacher efficacy. *EARLY CHILDHOOD EDUCATION & CARE*, 12(1), 29-51.
- Kim, S. S. (2013). The meaning of happiness as understood and articulated by young children. *Korean Journal of Early Childhood Education*, 33(3), 377-400.
- Kim, Y. H., & Kim, Y. J. (2016). *Social network analysis (4th ed.)*. Seoul: Pakyoungsa.
- Kim, Y. O. (2016). Current status of big data-related study and tasks of early childhood education in Korea. *Korean Journal of Early Childhood Education*, 36(6), 181-206.
- Lee, E. S., & Lee, K. N. (2016). The effects of child care teacher's job stress, child care efficacy and commitment on happiness. *Korean Journal of Child Education and Care*, 16(4), 107-127.
- Lee, K. M., Yoon, H. K., & Byeon, S. Y. (2016). An analysis of research trends in happiness studies in early childhood education. *Korean Journal of Early Childhood Education*, 36(2), 497-514.
- Lee, S. B., & Hwang, H. S. (2016). The influence of the organizational culture of a daycare center and creative personality on happiness in daycare teachers. *Journal of Future Early Childhood Education*, 23(2), 137-155.
- Lee, S. S. (2013). *Network analysis methodology*. Seoul: Nonhyeong.
- Lee, Y. H. (2011). The Study on the Effects of the Determinants of Happiness of Childcare Staff on Their Satisfaction with Work. *Korean Journal of Child Welfare*, 9(2), 1-19.
- Lee, Y. S. (2017). A basic study for utilizing big data in early childhood education. *Korean Journal of Early Childhood Education*, 37(4), 585-610.
- Ministry of Education (2017. July, 25). Ministry of education free semester system. Retrieved from <http://www.ggoomggi.go.kr/>
- Oh, J. Y., & Kim, K. R. (2015). A study on early childhood teachers' happiness from the viewpoint of ecological theories. *Journal of Early Childhood Education & Educare Welfare*, 19(3), 29-51.
- Oh, S. H., & Kim, S. H. (2016). Early childhood teachers' euphoria according to teacher's background variables. *The Journal of Learner-Centered Curriculum and Instruction*, 16(10), 141-165.
- Peterson, C., & Seligman, M. (2004). *Character strengths and virtues: A handbook and classification*. Washington, DC: American Psychological Association.
- Ryff, C. D. (1989). Happiness is everything, or is it? Exploration son the meaning of psychological well-being. *Journal or Personality and Social Psychology*, 57(6), 1069-1081.
- Ryu, C. S. (2016). Happiness of kindergarten teachers: A Q-methodology approach. *Journal of Korea*



*Academia-Industrial cooperation Society*, 17(8), 433-441.

Seligman, M. (2011). *Flourish: A visionary new understanding of happiness and well-being*. NY: Free press.

\_\_\_\_\_ (2014). *Authentic happiness: Using the new positive psychology to realize your potential for lasting fulfillment*. (I. J. KIM, & M. S. Woo, Trans.). Gyeonggi: mulpure. (Original work published 2004)

Song, M. S. (2014). An analysis of the research trend of theses about early childhood teacher's happiness. *Korean Journal of Children's Media*, 13(3), 149-169.

Woo, M. S. (2016). *Positive psychology is an opportunity*. Gyeonggi: mulpure.

## 한글 요약

# 빅데이터를 통해 살펴 본 유아교사의 행복에 대한 네트워크 분석

황해익 · 이강훈

본 연구에서는 네트워크 분석 통해 유아교사의 행복에 대한 사회적 인식을 살펴봄으로써 유아교사의 행복한 삶을 지원하기 위한 기초자료를 마련하는데 목적이 있다. 본 연구목적을 달성하기 위해 Textom에서 제공하는 빅데이터에 기반하여 '행복 + 보육교사', '행복 + 유치원 교사'를 검색어로 rawDATA를 수집하였다. 수집된 데이터는 1차·2차 정제과정을 거쳐 단어빈도를 바탕으로 핵심 키워드 50개를 선정하였으며, 이를 중심으로 1-모드(nodelist1) 매트릭스 데이터를 작성하여 네트워크 분석을 실시하였다. 연구결과, 보육교사의 행복과 유치원 교사의 행복에 대한 사회적 인식에서 '유아', '원장', '교사', '학부모', '유아교육기관', '문화', '과정', '지원'이 공통적인 핵심 키워드로 나타났다. 또한 보육교사의 행복에서는 '복지', '정책', '서비스'가 핵심 키워드로 등장한 반면, 유치원 교사의 행복에서는 '인성', '역량', '만족', '의미'가 핵심 키워드로 등장하였다. 연구결과를 통해 유아교사의 행복에 대한 사회적 인식이 구성원들 간의 관계(유아, 원장, 교사, 학부모), 근무환경(직무, 연수, 근무, 취업, 채용, 평가, 문화, 환경, 개선), 정부정책(국가, 복지, 교육, 자격증, 사회, 지원, 정책, 사업, 서비스, 연구, 개발), 심리·사회학적 특성(행복감, 인식, 인성, 역량, 만족, 의미) 등과 밀접한 관련이 있음을 보여 주었으며, 이와 함께 유아교사의 행복한 교직생활을 지원하기 위한 시사점을 제공하였다.

주제어 : 빅데이터, 유아교사, 행복, 네트워크 분석

Manuscript received October 31, 2017

Revision Received November 10, 2017

Accepted December 8, 2017

Translated manuscript accepted December 14, 2017