A Study on the Creativity and Personality Education of Elementary School Students: Focused on Big Data Analysis

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Background/Objectives: The purpose of this study is to explore the concept of creativity and personality education of elementary school students through big data. For the purpose of this research, rawDATA was collected using keyword "elementary creativity" using big data provided by Textom. **Methods/Statistical analysis:** The collected data were selected from 50 key words based on the word frequency after the primary and secondary text mining and the semantic network analysis was performed by converting the data into matrix data. **Findings:** As a result, 'education', 'program' and 'play' were the key keywords in the social awareness of creative personality education of elementary school students. In addition, educational method related factors (play, fairy tales, books, reading, forest, imagination, life, thought, integration), educational content related factors (creativity education, art, science, society, mathematics, leadership, creativity, emotion), educational subjects related factors (kindergarten, school, teacher, elementary school, student, school board, centre) and educational principles related factors (experience, activity, utilization) were shown to be closely related to each other. **Improvements/Applications:** Preschoolers' creativity was especially related to education, programs and play. This was meaningful to examine the relationship between concepts related to preschoolers' creativity in real data network, and suggested implications for preschoolers' creativity education based on these results.

Key words: *Big Data, Creativity and Personality Education, Elementary School Students, Big Data Analysis, Semantic Network Analysis.*

Introduction

With the spread of the digital economy, our society has come to a big data environment where much information and data are produced. Living in the era of the Fourth Industrial Revolution, where society is operated by big data, we are interested in big discourses such as social change. Therefore, when discussing future education and understanding society and culture, it is time to look at education from a macroscopic perspective that is widely explored throughout society rather than focusing on the interactions with members of society from a microscopic perspective. Thus, how ethical and moral people who deal with big data are, is an important issue these days.

In other words, the importance of 'big conscience' is emerging in the era of the Fourth Industrial Revolution (Lee, 2001); (Lee, 2006); (Cho, 1997). With these social trends, this study uses big data to explore the concept of creativity and personality education in elementary school. The reason why personality education in elementary school is important is because it is a stage before personality is solidified compared to middle and high school students entering puberty (Choi, 2006; Lee, 2002; Lee; Cho, 2008).

Future social studies based on the fourth industrial revolution are becoming a hot topic worldwide in a day-to-day changing knowledge and information technology society. The tools and technologies we know and use combine with digital, and are being used in various fields, including robots and artificial intelligence, self-driving, drones, the Internet of Things, big data, the cloud, 3D printers and virtual reality, creating a new culture. Therefore, it is becoming more important to solve the problems of reality in a new way that has not existed, through creative thinking rather than the amount of knowledge and information that humans know. There is a growing demand for existing education methods and learning to realise the dreams and talents of each student in order to foster the necessary sophistication for students to live in this future era.

The fourth industrial revolution era is not about prioritising intelligence and academic achievement, but about individual creativity and character. If copycat education has led the nation's national development in the past, it is today's trend to see that the driving force behind the growth of future societies lies in creative education, which thinks and creates new things. Future education should be the centre of learning in teaching education, and creativity and character are paramount to the core of education that finds and nurtures students' potential and desirable values (Jung et al. 2019).

The talk that creativity and character should be emphasized in school education has long been argued and much discussed. Creativity and character are both important. So learning must happen at the same time. And not just in thought, but in combination with policy

support and administrative efforts to develop a map model for each subject and spread it to the site.

The core competencies that learners need to cultivate for education that can adapt to our future society are being selected, and in this respect the concepts and content of creative personality education are being defined. Creative personality education aims to nurture talent that can contribute to a happy society with the expression of individual abilities, with a focus on bringing out students' potential and forming desirable values, and fostering talent that can adapt in a pluralistic context through teaching methods centred on experience, discussion and exploration.

However, even though creative personality education is an important topic in elementary, secondary, higher education and even college education, the educational field reports that it questions what the concept of creative personality education is and how it can be practiced in the actual educational field, including what is different from the existing one. It is also pointed out that the concept of creativity and character is not much different from traditional education in its cultivation of a virtuous body and that in-depth discussions on setting up relationships are not supported. Such a concept of creativity, not by academic exploration but by policy considerations, can cause confusion along with existing creativity or personality concepts. In other words, although education on creativity and character has been a constant topic in the existing educational scene, it was not free from criticism about presenting creative personality education to foster the core competency of our future society as if it were a new concept, and so emphasising it in a policy way could only add confusion to teachers.

Therefore, I would like to study social awareness about creative personality education focusing on the elementary school period. In the previous study, there is a study that examines creativity education of preschoolers using big data (Park and Lee, 2013; Lee and Je, 2018). But there is no big data research for elementary school students. In this regard, the concept of personality education in elementary school and social awareness research will be conducted using big data for the past 5 years. In addition to the debate over the concept of creativity, creative personality education during elementary school years tends to be more unassailable with the reception of that concept. Therefore, through big data, we want to look at the social perception of creativity and personality in elementary school years, to draw concepts of creativity and personality in elementary school years, and to find out the relationship between the keywords derived. Through this, I would like to confirm how our society was looking at creativity and personality in elementary school, while also suggesting implications for educational aspects to promote creativity and personality.

Materials and Methods

The purpose of this study is to examine the social awareness on the creativity education of elementary school children in Korea and the semantic network analysis method was used using online data collected from internet portal sites (Google, Naver, Daum). R-program, Ucinet 6.0, and Netdraw are utilized for big data analysis such as semantic network analysis. In this study, the data for the last five years was analysed in consideration of the point in time when creative personality education was emphasised and the amount of data analysed

Experimental Results

As a result of testing the statistical significance of elementary school students' creative personality education, the sampling distribution mean of the semantic network data was 31.7225 and the standard error was 3.2847.

As a result of calculating the Z-score value, the probability that the test statistic was observed higher than the absolute value of Z value with $Z = 9.5093$ was 0.0002 ($p < .01$).

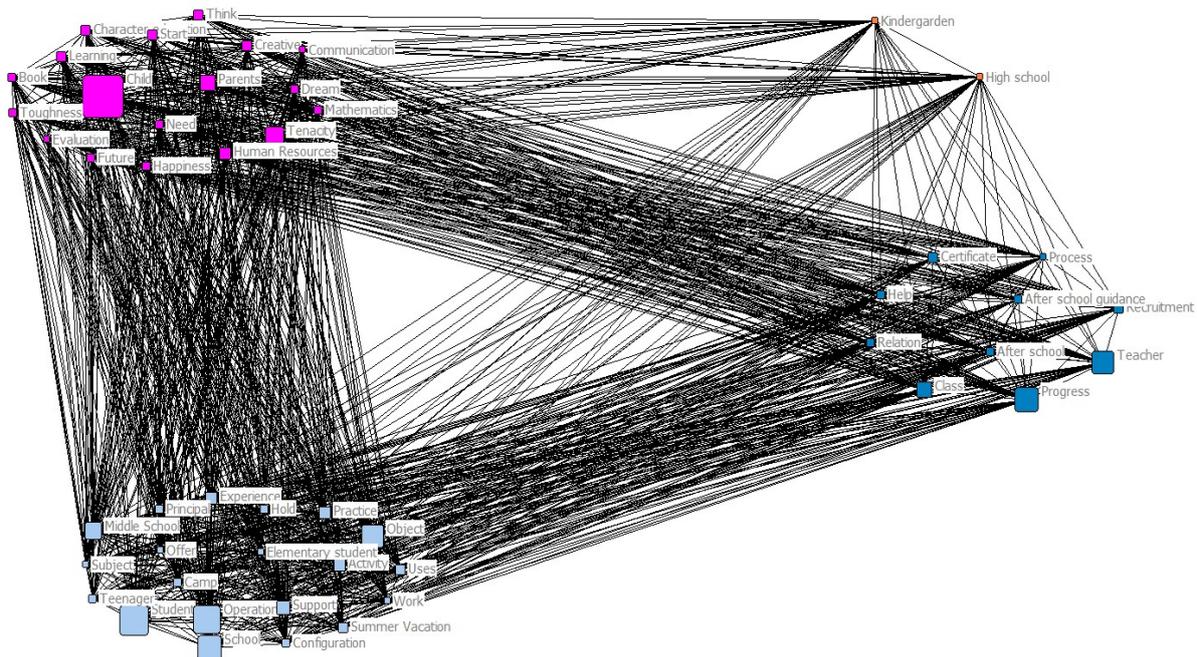**Table 1:** Frequency and TF-IDF of "Elementary School Students' Creativity and Personality"

no	Word	Count	Tf-Idf	No	Word	Count	Tf-Idf
1	Child	1839	3578.529	31	Need	382	1335.666
2	Student	1330	2922.309	32	Principal	379	1276.205
3	Operation	1230	2702.586	33	Toughness	378	1259.573
4	Progress	1083	2493.7	34	Happiness	378	1298.047
5	School	1048	2512.994	35	After school	369	1255.042
6	Teacher	987	2452.603	36	Camp	365	1276.225
7	Object	968	2321.163	37	Future	363	1246.537
8	Tenacity	836	2077.382	38	Mathematics	356	1265.704
9	Middle School	722	1905.399	39	Book	340	1218.396
10	Parents	707	1960.22	40	Hold	335	1171.33
11	Class	702	1946.357	41	Help	334	1146.952
12	Support	610	1827.397	42	Offer	315	1101.4
13	Human Resources	548	1641.661	43	Evaluation	309	1115.774
14	Experience	533	1596.725	44	Process	308	1120.377
15	Activity	526	1625.888	45	Elementary student	307	1100.14
16	Practice	491	1517.702	46	Subject	301	1070.16
17	Character	486	1523.85	47	High school	300	1066.604

	education						
18	Think	483	1554.717	48	Communication	297	1072.443
19	Certificate	469	1625.43	49	Kindergarten	297	1064.305
20	Start	449	1407.837	50	Work	294	1061.61
21	Recruitment	443	1521.256				
22	Uses	442	1404.7				
23	Creative	426	1371.241				
24	Learning	424	1364.803				
25	Summer Vacation	417	1418.299				
26	Dream	407	1341.406				
27	After school guidance	401	1489.142				
28	Teenager	399	1357.078				
29	Relation	396	1384.617				
30	Configuration	391	1288.672				

As a result of analysing the word frequency according to the simultaneous appearance by collecting online data of 'elementary + creative personality + education', 'children' showed the highest frequency in 1839 times. Subsequently, 'students' appeared 1330 times, 'operation' 1230 times, and 'progress' 1083 times.

In addition, school (1048), teacher (987), Object (968), Tenacity (836), middle school (722), parents (707), class (702), support (610), Human Resources (548), experience (533), Activity (526), practice (491), character education (486), Think (483), Certificate (469), start (449), recruitment (443), Uses (442), Creative (426), learning (424), Summer Vacation (417), Dream (407), After School guidance (401), Teenager (399), Relation (396), Configuration (391), Need (382), Principal (379), Toughness (378) , Happiness (378), after school (369), camp (365), future (363), mathematics (356), books (340), hold (335), help (334), Offer (315), Evaluation (309) , Process (308), elementary student (307), subject (301), high school (300), communication (297), kindergarten (297), work (294) in order.

Figure 1. 50 Words Graph of "Elementary School Students' Creativity and Personality**"**

Figure 1 shows the network analysis of 'elementary + creative personality + education' through Netdraw. Words such as activities, parents, learning, use, school, happiness, and students are more prominent. In other words, activities, parents, learning, utilisation, school, happiness, and students can be seen as key words in this study.

In creative personality education, activities, parents, learning, utilisation, school, happiness, and students can consider content composition with parents mainly for experiential activities for happy school life of students as derived from key words in this study.

Figure 2. "Elementary Creativity and Personality Education" 50 Words CONCOR Graph

In particular, through the Concor analysis, which visually groups and displays 50 words, it is possible to confirm what words are highly relevant to the elementary window personality education. Looking at three representative groups, it is as follows.

First, you can see that words such as children, parents, learning, happiness, books, and toughness are combined. These results show that children and parents are educating toughness through books.

Secondly, it is composed of words such as elementary school, student, administration, theme, experience, summer vacation, etc., and it is possible to know that elementary school students have the opportunity to see experiences on various themes during summer vacation.
The final third is made up of words such as after school, teacher, progress, class, course, and certification. In other words, it can be inferred that the teacher advances the class after school and the qualifications for that are activated.

Table 2: Analysis of "Elementary Creativity and Personality Education" using Ucinet

no	Word	Degree	Closeness	Eigenvector	Between
1	Child	3657	49	0.351036	1.541222
2	Student	3839	50	0.590271	0.75537
3	Operation	3265	49	0.540947	1.541222
4	Progress	3512	49	-0.0989	1.541222
5	School	2904	50	0.446891	0.75537
6	Teacher	3441	49	-0.69897	1.541222
7	Object	2959	49	0.486844	1.541222
8	Tenacity	1832	50	0.174728	0.75537
9	Middle School	1856	50	0.263678	0.75537
10	Parents	1966	49	0.370156	1.541222
11	Class	2367	50	-0.31057	1.424588
12	Support	1873	49	0.201939	1.541222
13	Human Resources	1355	49	0.191814	1.541222
14	Experience	1763	51	0.353675	0.413166
15	Activity	1456	49	0.210763	1.541222
16	Practice	1591	49	0.177233	1.541222
17	Character education	1032	49	0.102317	1.541222
18	Think	633	51	0.058839	0.413166
19	Certificate	2332	61	-0.87544	0.484515
20	Start	1001	51	0.158501	0.689186
21	Recruitment	1011	50	-0.02471	0.75537
22	Uses	904	49	0.087976	1.541222
23	Creative	1165	49	0.16629	1.541222
24	Learning	1056	50	0.117316	1.435589
25	Summer Vacation	1322	53	0.223249	0.221761
26	Dream	1378	52	0.277831	0.391427
27	After school guidance	2361	70	-1	0.068804
28	Teenager	959	51	0.12498	1.305512
29	Relation	2176	51	-0.86694	1.334828
30	Configuration	1138	49	0.117434	1.541222
31	Need	569	50	0.041758	1.394767
32	Principal	1062	52	0.215269	0.266711
33	Toughness	866	51	0.14389	0.413166
34	Happiness	1097	49	0.180193	1.541222
35	After school	1331	52	-0.13986	1.400965
36	Camp	1044	53	0.170438	0.244488
37	Future	1043	51	0.208175	0.689186

38	Mathematics	591	52	0.071388	0.367134
39	Book	743	50	0.09572	0.75537
40	Hold	1149	50	0.179866	1.475039
41	Help	1364	49	-0.35497	1.541222
42	Offer	830	50	0.08313	1.435589
43	Evaluation	611	53	0.086735	0.244488
44	Process	1052	50	-0.10305	1.45245
45	Elementary student	795	52	0.132289	0.345994
46	Subject	819	51	0.114612	0.413166
47	High school	787	53	0.104383	0.659627
48	Communication	844	52	0.145182	0.368217
49	Kindergarten	949	55	-0.00853	1.030105
50	Work	884	50	0.144805	1.424588

The results of the analysis of the centrality of the 50 major words related to elementary creativity education are as follows. First of all, when looking at the Degree centrality, the values were higher in the order of 'children', 'student', 'operation', 'progress', 'school', 'teacher', and 'object'. This can be confirmed that it is directly connected with various words among the key words related to 'elementary creativity education'.

Second, in Closeness centrality, 'after school teacher', 'summer vacation', 'certification', 'experience', 'thought', 'beginning', 'student', 'school', 'personality', 'junior high school', 'classes' appeared in that order. Closeness centrality words mean that all words in the data network can be easily influenced. That is, words such as 'After School Teacher', 'Summer Vacation', 'Certificate', 'Experience', 'Think', 'Start', 'Student', 'School', 'Personality', 'Middle School', 'Class', etc. can be seen as playing a central role in the network structure. Finally, when analysing the Between centrality values, 'children', 'operation', 'progress', 'teacher', 'object', the results are listed in the order of 'Parent', 'Class', 'Support', 'Talent', 'Activity', 'Conduct', 'Character education', 'Utilization', 'Creative', 'Learning' and 'Youth' High.

That is, with 'children', 'operation', 'progress', 'teacher', 'target'. 'Parent', 'Class', 'Support', 'Talent', 'Activity', 'Performance', 'Character education', 'Use', 'Creative', 'Learning', 'Youth', it can be seen that there is a great influence among words which act as a mediator for connecting words.

Figure 3. Word Cloud for "Elementary Creativity Education" (30 words)
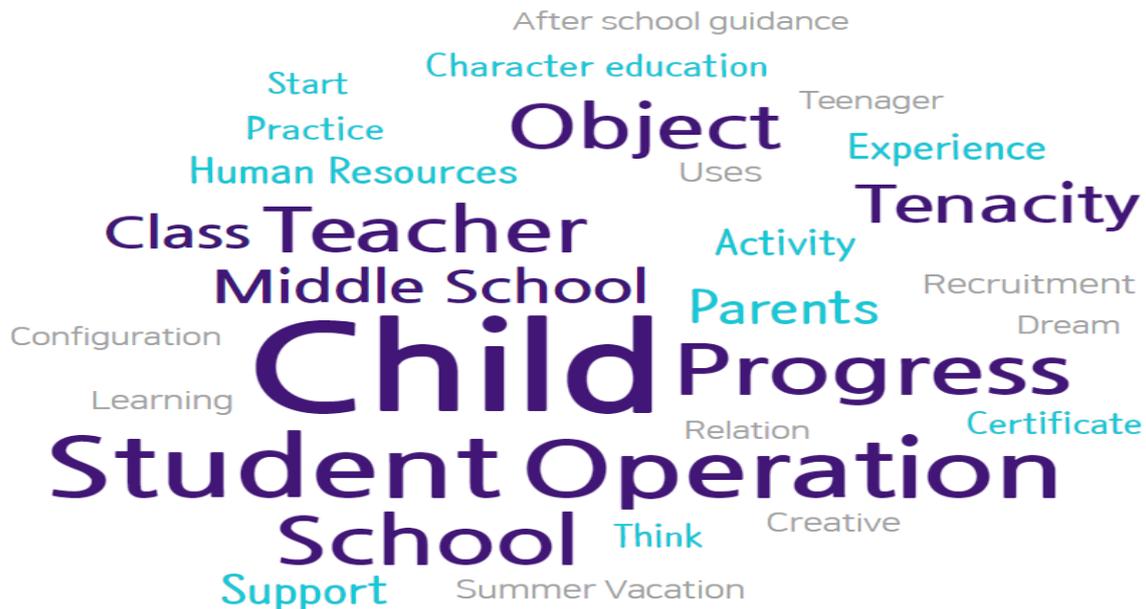
Conclusion

The purpose of this study is to analyse big data using semantic network analysis method, to examine the actual condition of creative creativity education of elementary school students, and to suggest future educational plans.

After collecting and analysing approximately 3,785kb of online data in order to analyse social awareness in creativity personality education in elementary school, significant information was extracted from big data on elementary creativity education.

First of all, the keyword with the highest frequency of appearance of the ball was "children, students, operations, school, and progress in the order of teachers."

As a result of the centrality analysis, Degree Centrality and Closeness Centrality were high. The keywords were 'student, school, personality, class, experience, and after school. There was also a high degree of "Between Centrality." The keywords were "Children's Parent Support and Character Education".

In this way, you can see that creativity and character education are being carried out in hands-on activities and after-school classes.

This shows that there is a lot of creativity and personality education occurring in hands-on activities and after-school classes.

Based on these results, we can provide experience-oriented programs and education that can be used in after-school classes as well as regular programs when developing creative personality education contents.

In particular, when developing creative creativity educational contents, the emphasis should be on nurturing human beings. In order to nurture human beings, it is necessary for each school to deliberately provide an effective educational program in which the student's physical, cognitive, emotional, social, and aesthetic development can be harmonised and to create such an environment intentionally. There is an urgent need for school education that looks closely at each student and values their humanity, and such schooling necessitates the faithful operation of special activities.

Furthermore, the goal of after-school classes is to cultivate students' autonomy, and ability to adapt to the changing social environment in order to foster democratic citizens based on the idea of holistic education in response to social changes and the internal and external demands of education. And the ability to build partnerships and smooth relationships, to develop potential and skills, to foster a sense of community through service activities, to develop patience and willpower through physical and mental discipline, and to promote group consciousness that can contribute to the development of schools, communities, and the nation. The focus is on developing a sense of responsibility and cooperation. Therefore, it is necessary to develop contents that consider both after-school class goals and social educational needs.

Thus, elementary school is an important time that greatly affects personality, and it is important to give the opportunity to experience the pleasure of completing and achieving something with constant effort and attention. In this regard, it can be helpful to develop creative creativity education contents, present it as a task or goal that students should perform, and to practise it. A desirable creativity education program is a good opportunity for students to feel successful, and can be effective in creativity and character development (Choi and Choi, 2016).

Acknowledgment

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