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Corresponding author*
E-mail: ssak82@dsu.ac.kr

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A Study on the Utilization of PUBLIC VALUES of the Zentangle Pattern and the Development of Nail Design

Mira Heo[1]

Dongshin University, Naju, Republic of Korea

Miso Kim[2]

Kwangju Women's University, Gwangju, Republic of Korea

Eunmi Choi[3*]

Kwangju Women's University, Gwangju, Republic of Korea

Abstract

Purpose: *Nail art today has taken its place as a genre of art to which individual and creative senses are added beyond the simple example of cutting finger and toe nails. With a view to expand the design of the Zentangle Pattern to the aspect of nail art by developing unique designs by utilizing the Zentangle Pattern via reflecting the preference of the modern people perennially seeking new objects, the purpose lies with developing a stimulus which presents only the main design by utilizing elements of reinforcement, thereby taking its place as a public value.*

Method: *As for the research method, the formative elements of the Zentangle Pattern were considered, and the 4 elements of dot, line, plane, and shape were utilized through the related previous papers and books, and based on the books carrying the contents similar to the curriculum taught at Zentangle.com of the United States, 42 pieces of main designs were presented with 7 points for 6 special characteristic for each reinforcement.*

Results: *As a consequent of which, the 6 special characteristics for each reinforcement of the Zentangle Pattern could be applied to the nail design in various angles to present possibilities of design.*

Conclusion: *Through this study, it was possible to confirm the potential for expanding the area of design by being utilized as a design which may elevate the consumers' satisfaction with visually unique and creative designs in the field of nail industry. It is expected that, based on the researcher's 42 pieces of main designs, various designs for the development of reconfigurable designs and new expressive techniques will become a subject of study which may carry a public value.*

[Keywords] ***Zentangle, Nail Design, Nail Art, Gel Nail, Pattern Nail***

1. Introduction

Nail art today is not just a merely concept of cutting finger and toe nails, but a genre of art to which unique and creative senses are added[1], while designs are being developed rapidly in the midst of the modern society[2]. Recently, many experts across various fields are studying the psychological and educational effects of the Zentangle work, which creates beautiful images by repetitively drawing simple patterns or applying colors with such simple tools as paper, pen, and colored pencils.

Dr. Meredith L. Yuhas, Director of the Center for Counseling and Welfare at St. Joseph's University and a professional psychologist, said that people will feel and recognize the effects delivered by Zentangle, including joy, concentration, meditation, and healing, in such a busy and complicated world, if a room if given to even hold a pen for the people. He said he would do it. Zentangle creators, Rick Roberts and Katharina Konigsbauer-Kolb, who learned Zentangle directly from Maria Thomas, said that is it such a great tool for the peaceful relaxation and the creation of wonderful products.

As such, Zentangle draws a structured pattern with a single line to create a highly original image and elevates the individual's happiness, and hence, anyone can enjoy it anytime, anywhere. As an

* This Paper Summarizes Miso Kim's Kwangju Women's University Master Thesis.

attractive art to which anyone can approach, this is an elegant metaphor for the deliberate artistry of life, and it is also thought that it can expand to various designs in the field of nail art[3].

As a result of studying the digital convergence contents by utilizing the Zentangle art, various video works were produced through various patterns, and the expansion of creations was attempted. Studied a drawing class[4] in which Zentangle is utilized. Furthermore, examining the previous studies related to the nail art in the order of recent years[5] developed emoji nail art designs, and [6]studied nail design by utilizing vanitas art.

While the cases in which Zentangle is applied and the previous studies related to nail design were conducted in various angles across various fields, the cases in which the Zentangle Pattern is implied and converged with the nail art are still in adequate. From this point of view, the Zentangle Pattern is an exploratory study intended to develop a design with potential for a nail design.

That is, we seek to present the possibility of nail design by utilizing the Zentangle Pattern by producing a stimulus which presents main design by paying attention to the elements for each reinforcement of the Zentangle Pattern with a view to expand the design of the Zentangle Pattern. Accordingly, this study will activate the sense of realism as a design of high level of design equivalent to the novel ideas and global senses, and it will also be valuable as a design indispensable for and good educational materials for the salons and educational institutions.

2. Theoretical Background

2.1. Background for the formation of the zentangle pattern

Zentangle is the work of drawing with pen and paper only, which is easy for anyone to learn, provides relaxation for the mind, and creates beautiful images by drawing structured patterns. One can recreate the pattern by drawing a division line which divides the surface of the paper into multiple areas with a pencil and drawing a simple line as a deconstructed pattern of the desired tangle[7]. Here, deconstruction is a term of Zentangle, which refers to the work of deconstructing a pattern into lines of element whereby the pattern can be recreated by simply repeating the basic lines in a structured order[8].

That is, Zentangle for doodling meditation which pacifies the mind, is a compound word of “zen” and complicated “tangle.” It may be said that it is a doodling meditation which anyone can enjoy so long as one has simple materials and tools such as a piece of paper and a pen. Maria, who was a calligrapher, said that while the manuscript she was writing was not working out well, she drew various patterns as she would allow herself in a corner of the paper, and she doodled without knowing it herself, and in that process, she felt that her dizzy and frustrated mind became lighter. Such experiences helped conceive “Zentangle” of today, which has the effect of venting away a troubled mind if one concentrate through the activity of drawing the same pattern repetitively. Given such an effect, it is being utilized today as a method of healing to stabilize the body and mind at schools, hospitals, community welfare centers, and mental health centers, etc[9].

2.2. Formative elements of the zentangle pattern

In general, all designs are organized and combined by their basic elements including form, color, and texture[10]. The components of the Zentangle Pattern are largely divided into shape and color, which act as important elements for drawing the pattern.

Shape is perceived primarily by vision and touch among our senses, and hence, it may be said to be an important element in forming the sensory experiences of the object along with colors. That is, all shapes vary according to their sizes and the space they occupy, and hence, design may be deemed to be fundamentally an arrangement of shapes. In general, for the matters handled in the category of the Zentangle shapes, it may be completed by expressing a multi-anglular pattern through the 3 formative elements of dot, line, and circle[11].

2.2.1. Dot

Dot is defined as a small, rounded marked table in terms of the dictionary, and in terms of the formative language, it refers to the basic unit which begins with a dot and connects to a line and a plane. A dot appears at both ends of a line, at the intersection of lines, at the refraction of a line, and at the intersection of a plane and a line. It has no size, but only has a position, and also has various sizes for the visual stabilization. When a dot is the center and the surroundings concentrate, and if there are two dots, an invisible line is recognized between the two points. Furthermore, when there are many dots, it develops into a long line or plane[12][13][14].

In geometry, a dot becomes the link between silence and language by expressing the highest simplicity and modesty. Meanwhile, it is the most concise form internally and the smallest basic form externally. When a dot increases the number, a certain echo such as a storm rolls out in the screen[15].

Therefore, dot is a most fundamental element of formativeness and may also be defined as having only a position and no size. Kandinsky said that “a dot is an immaterial form of substance, whose essence is invisible, and when thinking about it as a substance, it is equivalent to zero, and also means the most concise and restrained expression”. We can understand and know that a dot is where a smallest figure, a simple figure, and two straight lines intersect. When the most ideal dot is considered as a circle, the shape of a dot may be a small circle or a large circle, and even if it is not a circle, it cannot be a dot[16]. There are also indeterminate dots of various shapes(triangle, square, oval, rectangle, and polygon) since the size or shape is not specific.

2.2.2. Line

If you examine the dictionary meaning of “line,” it is defined as “a drawn line or string,” “a thin and elongated shape,” and “a thing having only a length and no width or thickness”. Since a line is consisted of countless dots, the information on the length of line, which may be said to be an extension of a dot, and the information on the position of the line, may be inferred. As such, the line operates and is utilized as a basic visual element for and in the creative expression. It began with the concept called “drawing” and developed from the basic concept of a study or rough sketch, and thereafter, “drawing” itself was recognized as an independent piece of work. Based on this independent area and independent character as such, painters used line as a means of expressing themselves[17].

Line is a most familiar component of art among the formative elements. Whenever we write, or whenever we create or draw anything, we draw a line first. Therefore, line is one of the formative elements of art which is the most flexible and clearly conveys the meaning. Line is an element which can express shapes without colors or contrasts, and if you examine comb patterned potteries, hieroglyphics, or pictograms used in ancient times, geometric shapes drawn with lines can be seen, and line is intimately related to our daily life, and it is an essential formative element[18].

David Lauer said that line is a very rich means of expression and also carries a maximum meaning that it can express all emotions and moods even with a minimum effort. Line has unlimited possibilities, can express various emotions, and approaches us easily and friendly[16][19].

2.2.3. Circle

Circle is the trajectory of a dot at the same distance from a vertex and a planar figure surrounded by the trajectory, which has neither a beginning nor an end. It is also a complete formative form which begins by drawing a geometric curve and returns to the point of start. If you examine the meaning of circle in the English dictionary, it is used as circle : “A trace like a distance from a dot on a plane, In terms of meaning, a group, society, circle, cycle, circulation…system," etc. As circle may be seen through the various uses as such in the etymological sense, geometric circle is a formative element created and developed by the mankind[20].

Kandinsky defines a circle as “the smallest and roundest circle we can imagine in an abstract thought or idea is a circle.” Furthermore, if the two forces are likely to continue to roll such a dot under the same terms and conditions, the curve resulting herefrom will soon arrive at the point of start again.

The start and the end will be absorbed into each other and be disappeared without a trace of a moment. Here, the most unstable, and simultaneously, the most solid plane is established. Circle is a dynamic form of infinite cycle of movements and constancy of rotation in a balanced form, and simultaneously, it is of a static form with no specific direction. A circle of central symmetry which does not incline in any direction is a perfect formative shape which provides a sense of infinite space and stability. A circle may be divided into a circle, ring, and an ellipse according to the shape[21].

2.3. Application of the zentangle pattern

2.3.1. Coloring book

Coloring means an artistic activity which utilizes relatively simple and various media such as colored pencils, markers, and pens for the printed designs. Coloring book, which has been recently published under the title of “Coloring Games for Adults,” is a book of collection of the rough sketches of elaborate patterns to enable such coloring activities[22]. Just as the coloring book, artistic play using drawings or coloring is also actively used for education[23]. The fever which began with the publication of the coloring book entitled “Secret Garden” in the second half of 2014 continues even to the present, and also remains among the bestsellers of bookstores across the nation both on- and off-line <Figure 1>.

Figure 1. Coloring book[secret garden].

Note: https://book.naver.com/bookdb

Five of the top 10 best sellers for books sold on Amazon in the United Kingdom are coloring books, and such a situation is not so much different in Korea. Interpark’s data indicated that book sales increased by 426% and the number of coloring books published by 126% from January until the end of May 2015. Furthermore, in 2017, they were ranked top 10 among the sales records of Kyobo Bookstore and Aladdin Bookstore. Such coloring books have internalized the desire of the modern people to care for their tired mind from the daily life through the separation from the stress of concentration through immersion and the sense of achievement which may be felt by completing the work without difficulty by using colors[24].

Coloring activity is effective in stimulating and promoting the people who are not so confident in drawing pictures to help them express themselves relatively with ease by choosing colors on the already completed sketchs and express their inner feelings well <Figure 2>. One can create pieces of work of a high level of satisfaction even with little energy and dexterity, and hence, it helps one feel the joy of expressing oneself through the act of painting one's inner self, and simultaneously, feel the aesthetic satisfaction and sense of achievement[25].

Figure 2. Coloring book[design using zentangle pattern].

Note: www.interpark.com

2.3.2. Paper cutting

In the recent drama entitled “Cheese In the Trap,” “paper cutting,” which is known to be Jeong Ui Yoo’s(Hae Jin Park’s) hobby in the show, may also be deemed as an application of Zentangle <Figure 3>. The paper cutting technique is one for expressing various artistic qualities on paper using scissors or a carving knife, and since it is simple and inexpensive for the paper being used, it has been developed with regional characteristics and cultural symbolisms inherent across the world[26]. That is, it may be said that it is a paper craft by which one cuts out a rough sketch drawn on the top of a paper and cuts it into a single piece of work. If one concentrates and cuts along the line, one will end up completing a brilliant work of art, whose process is also related to the process of completing the Zentangle Pattern.

This is a work which requires a high level of concentration, and today, educational materials called “paper cutting art books” are sold on the Internet and at bookstores as they help people relieve stress and heal. Excellent designs which highlight the attractiveness of paper are decorative props and are also utilized as 2D and 3D mobiles and picture frames, etc.

Figure 3. Cheese in the trap drama papercutting.

Note: https://post.naver.com/viewer

3. Details and Methods

3.1. Research method

This research method is based on the analysis of the intentions of art therapy based on Zentangle's pattern through the literary review. Furthermore, when describing the theoretical background, we primarily referred to degree thesis papers, conference papers, references, and dictionaries, etc., across the fields of aesthetics, psychology, education, and beauty, and partially, have utilized the contents collected through the searches on the Internet and various materials.

In this study, as a result of examining multiple previous papers, 4 items were selected – dot, line, plane, and shape - as the most frequently mentioned among the formative elements, and the philosophy of Rick Roberts, the founder of Zentangle, and Maria Brown was inherited as it is, and based on the book carrying the contents most resembling the curriculum taught at Zentangle.com of the United States, the stimulus was produced in connection with the Zentangle's work.

3.2. Materials and tools

A pen exclusive for gel nail requiring curing work with a UV lamp or LED lamp was selected. This pen is manufactured in the same shape as sign pen, one sold in the market <Table 1>. However, it can be used for various purposes as one can draw lines and apply colors by including shading, yet the caveat is that it cannot be used for general nails and must only be used after applying a base gel or color gel without exception.

Table 1. Materials and tools used in researcher stimuli.

a. UV&LED lamp	b. Pull tip	c. Base gel	d. Mat top ge	e. Paper
f. Gel cleaner	g. Tip with stand	h. Tip adhesive	i. Monami nail art pen	

At the time of the researcher's stimulant production, the gel of Mostive Co., Ltd.(of Korea) was primarily used for the Full Tip No. 2(oval type), while the plane design method was used. The structure of the design and materials used across the work was presented with uniformity, and in addition, the types and colors of pens were restricted by using only black and gray among the 8 types of nail art pens newly developed by Monami Co., Ltd.

4. Result and Consideration

Zentangle, which is a uniquefield of art, may allow one to achieve a meditative effect by drawing

various tangles as if doodling, providing a peace of mind and increasing creativity and self-esteem[9]. This is completing a beautiful image by repeating and arranging simple lines in a specified space, which can be drawn with ease by anyone who has never done any design work. As such, nail design has artistic elements including creating the aesthetic beauty by using structured formatie elements such as straight lines, dots, curves, and circles in a small space called nail, and hence, the elements of the Zentangle's pattern are correlated to the nail art.

First, aura is a technique which creates one or multiple borders along the contour, and also helps to smoothly transition from one pattern to another <Table 2>. It has important visual elements of the line, and simultaneously, has a strong psychological effect. In general, the aura pattern is structured with straight lines and curves to produce works.

Second, dew drop was used to utilize the structural characteristics of a curved pattern (block deformation) or a straight pattern, and is also a technique for expanding the circle forming patterns. If light and shade are well added here, one can give off the impression that the water droplets have enlarged the pattern, and it relieves the monotony of the pattern and expresses details to induce the eye to attract the viewer closer, while making him or her to want to touch it <Table 2>. Therefore, it visually shows the area of illusion and marks it as a clear and specific size of expression or shape with a carefully planned structure.

Third, puff puts pearl like dots around the tangle to form a dramatic point <Table 2>. It brings about the same effect when enclosing the edge of the tangle, and it was able to express in harmony with the elements of reinforcement of the other tangle’s elements of reinforcement including aura and rounding. Puff is a technique which repetitively draws various dots around the tangle, and without the presence of size and direction, by expressing only a geometric position, it may be said that it is an abstract concept devoid of length, width, and depth, and hence, it reproduces the directions of the shape dispersed each individually, plainly speaking.

Fourth, rounding showed detailed specifics which elevate the level of completion for the tangle by filling gaps or applying dark colors to areas such as holes. That is, it is a pattern which stresses the effect of focusing on the pattern in the overall structure of the tip as three dimensionality, sense of weight, and sense of depth are created <Table 2>. For the immediate effect of expressing the essential characteristics of rounding, a single element or multiple elements express an orderly and regular flow in a simple and uniform manner of structure, thereby forming geometrical features in terms of shape. Works using black and white can provide visual stimuli to the viewers, and hence, the effect of a design with strong attention was achieved. Therefore, this is a method of design which allows one to feel the rhythmic three dimensional beauty of formativeness in the harmony of shape.

Fifth, contrast could provide a sense of depth, three dimensionality, and shape for all patterns. If contrast is produced in a variety, a flat line changes into a three dimensional shape, and when contrast is added, the change of tone is important, and the contrast of white, black, and gray was required for the shape to become clearer and attract attention <Table 2>. The interaction of light and shade alone created formative changes and effects in the tip, and it was produced such that gradation took place at the borders with the illusion enabling the contours or lines even clearer while stressing on the differences between the areas of design according to the shade of the background.

Sixth, when drawing a tangle, sparkle can be thought of as a dotted line which deliberately cuts the line. Sparkle brings about the same effect as a small twinkling light, which was utilized for attracting attention and making repetitive patterns to look attractive <Table 2>.

Table 2. Zanghwa-byul researcher stimulates in zentangle pattern.

Sepa-ration	Motif		The woks of nail art						
			1	2	3	4	5	6	7
Aura									
Dew drop									
Puff									
Round ing									
Con-trast									
Spar-kle									

5. Conclusion

This study is one on the attempt, and the purpose of this study is to develop a stimulus for the nail design which presented only the main design by focusing on the elements of each reinforcement with a view to expand the design of the Zentangle Pattern.

As for the research method, for the theoretical research, the background of the formation of the Zentangle Pattern and the formative elements have been considered. As a result of considering the previous papers related to the formative elements, the 4 items of dot, line, plane, and shape were selected as they were most frequently mentioned, and by inheriting the philosophy of Rick Roberts, the founder of Zentangle, and Maria Brown, and based on the books carrying the contents most resembling the curriculum taught at Zentangle.com of the United States, connection was made to the works of Zentangle, thereby producing the stimulus for the main design for a total of 42 pieces with 7

points each with a focus on the 6 elements for each reinforcement.

The result of the study are as follows. First, aura stresses straight lines and curves, making it possible to produce a design while expressing with concision and simplicity. Second, dew drop was able to express a formative sense of rhythm with an optically illusive design. Third, puff was able to stress the aesthetic areas by inspiring natural elements. Fourth, rounding expressed a design of visual weight by filling in the outer or inner part to emphasize the plane. Fifth, contrast presented a three dimensional design opposite to the presence or absence of light, and sixth, sparkle was naturally structured in the midst of various patterns by aligning the dotted lines as uniformly as possible.

As such, it was possible to develop a creative pattern for the nail design even while it seemed complicated given the use, repetition, and endless subdivision of the lines by utilizing the special characteristics for each reinforcement of the Zentangle Pattern. Through this study, it was possible to confirm the possibility of expanding the area of design by being utilized as a design which can elevate the level of satisfaction for the customers with visually unique and creative designs in the field of nail industry. Through the researcher's 42 pieces of main design, it is expected that more diverse designs will be continuously studied to achieve and share public value by developing various designs which may be reconstructed and by approaching new techniques of expression.

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7. Appendix

7.1. Authors contribution

	Initial name	Contribution
Lead Author	MH	-Set of concepts ☑ -Design ☑ -Getting results ☑ -Analysis ☑
Corresponding Author*	EC	-Make a significant contribution to collection ☑ -Final approval of the paper ☑ -Corresponding ☑ -Play a decisive role in modification ☑
Co-Author	MK	-Significant contributions to concepts, designs, practices, analysis and interpretation of data ☑ -Participants in Drafting and Revising Papers ☑ -Someone who can explain all aspects of the paper ☑

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Corresponding author*
E-mail: shinsona@halla.ac.kr

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A Review Study of Information-Structural Perspectives on THERE Existential Sentences

Sona Shin

Halla University, Wonju, Republic of Korea

Abstract

Purpose: *This paper is to review some recent studies on There existential sentences under the notion of Information Structure, showing that the main purpose of using There sentence is to stress negative or quantifier words within the sentence. It begins with some research data on the patterns of There existential sentences in two English novels, one Korean-English translation and three versions of English-Korean translation: 'Sense and Sensibility', 'Pride and Prejudice' by Jane Austen; and three English-Korean translations of 'Pride and Prejudice' . Then, it follows two empirical studies on the acquisition level of There sentences.*

Method: *There are two studies on research data analysis and two empirical studies. The first research data of two novels is from Literature Online Collection(Lion) and uses AntConc corpus analysis toolkit(3.5.8.0). In the second study, 'The Vegetarian' is chosen as a representative of Korean-English novel because it won The Man Booker International Prize. However, the three English-Korean translated versions of 'Pride and Prejudice' are randomly chosen. Then, the first acquisition level study has 17 university students answer 9 questions on information structure sentences; There expletive, passive and inversion sentences, and the second study has 75 students answer 12 questions on There sentences only. Both studies use SPSS 20.0 for the data analysis.*

Results: *According to the text analysis, more than 50% of There sentences have negative words or quantifiers with nouns as a way of end-focus realization. In other words, one of the main reasons to use the There construction is to stress the non-existence of a certain noun or the quantity of a noun using There expletive. Thus, the data from translations says There sentences with quantifiers are more realized than those with negatives, and this also applies to the level of acquisition. The survey participants of the empirical studies are shown more aware of the sentences with quantifiers than negative words.*

Conclusion: *English writers or speakers use There expletive sentences for specific reasons and one of them is to make readers or hearers to focus on some negatives or quantifiers with the nouns within the sentence. However, it seems that this reason has not been considered in both English education and English-Korean translation. Even though the studies mentioned in this paper need more back up data in both research and empirical area, this summary of previous studies will be a starting point to lead to further studies in this field.*

[Keywords] ***Information Structure, There Existential Sentences, End-Focus Realization, Negatives, Quantifiers***

1. Information Structure and There Construction

It has been well known that there are five components of an English sentence, such as subject, predicate, object, complement and modifier. On the information structural perspective, however, an English sentence is divided into two parts, old(discourse-old or hearer-old) and new(discourse-new or hearer-new)information. There are different terminologies for different scholars. For Halliday(1978), they are theme and rheme and rheme always comes after theme [1], and Vallduvi & Engdahl(1996) subdivide the ground(theme) into link and tail [2].

Even though there is some difference in those terminologies among scholars, they all agree with the fact that old information comes first and new information later in a sentence. Then, in this latter part, English speakers or writers put an important information they want to stress and it is called end-focus realization. This is the main principle of information structure and There expletive sentence is one of the useful tactics English use to realize it[3][4][5].

2. Data Analysis

2.1. Patterns of there sentences in English novels[6]

Jane Austen is one of the representative English writers and 'Sense and Sensibility'[7] and 'Pride and Prejudice'[8] are her major pieces. Therefore, there have been numerous studies of those novels but none of them is based on information structure. The importance of this study lies on this.

After the study, it is found that There construction accompanies various nouns but those with negative or quantifiers combined are more than 50% of each novel. The nouns in the other There sentences do not carry any specific particles so none of them has something in common to be classified. As shown in the following <Table 1>.

Table 1. Particles with nouns in there construction.

Text / Particle	English novel	
	Sense and sensibility	Pride and prejudice
Negatives	63	80
Quantifiers	59	78
Etc.	29	119
Total	151	277

In 'sense and sensibility', the most frequent particle is negatives, quantifiers and etc. in order and in 'pride and prejudice', etc., negatives and quantifiers. However, in both novels, negatives and quantifiers combined are more than 50% of the total, which shows the importance of those particles in There sentences to be end-focused.

2.2. Patterns of there sentences in Korean-English translations[9]

The second resource on There sentences is 'The Vegetarian' by Deborah Smith[10]. This is an English version of '채식주의자' by Han Kang and the winner of The Man Booker International Prize in 2016. It is the first time the English version of Korean novel won this prize and this is the reason 'The Vegetarian' is chosen as the resource data. This English version is divided into three parts; The Vegetarian, Mongolian Mark and Flaming Trees. The data analysis data is shown in <Table 2>.

Table 2. Particles with nouns in there construction.

	The vegetarisn	Mongolian mark	Flaming trees
Negatives	18	18	27
Quantifiers	6	7	8
Etc.	9	20	15
Total	33	45	50

Except for the second 'Mongolian Mark', the number of nouns with negatives or quantifiers combined is over 50% of the total. This is the same result of the previous English novel data. However, the reason for the difference between the second part and the others need further study.

2.3. Patterns of there sentences in English-Korean translations[11]

In order to see how There sentences with negatives or quantifiers are translated based on the notion of end-focus realization, this study analyzes three versions of translation. They are all randomly chosen regardless of when they are published, who published and translated. As shown in the following <Table 3>[12][13][14].

Table 3. Source and target texts.

	Writer/translator	Year of publishing	Publisher
Source text	Jane Austen	1966	W.W.NORTON & COMPANY, INC.
Target text 1	Kunsik Hong	1998	Yukmoon-sa
TT2	Jikwan Yoon and Seunghee Jeon	2004	Mineum-sa
TT3	JungA Go	2019	Sigong-sa

Followed are some examples from the texts.

ST1: -But-good lord! how unlucky! there is not a bit of fish to be got today. (42)

TT1-1: 오늘은 생선 한 토막도 없으니 말이다 (77)

TT1-2: 오늘은 생선이 한 마리도 없는데 (89)

TT1-3: 오늘은 생선을 살 수 없다고요 (90)

The source sentence has a negative word 'not' and a quantifier 'a bit' at the same time and the first and second translations fully realize the end-focus of the source text. Both sentences even use focus particle '도' in Korean. However, the last version of the target text does not realize the quantifier. The sentence is negative but the verb is different from the one in the source text. Therefore, it does not stress the non-existence of the noun 'fish' and the meaning is not same, either. Below is another set of example sentences.

ST2: But there is one of their sisters sitting down just behind you, (7)

TT2-1: 하지만 자네 바로 뒤에 그 여동생이 한 사람 앉아 있네. (20)

TT2-2: 그렇지만 저 아가씨 동생 하나가 바로 자네 뒤에 앉아 있는데, (20)

TT2-3: 그런데 자네 뒤쪽에 그 아가씨 여동생이 앉아 있어. (23)

In this source sentence, there is only one quantifier and it is well realized in the first and second translated sentences but the third translation does not realize the quantifier. It is not adequate to say that the third version is bad or wrong, however, it is true that the third one is clearly different from the other versions and the source text. The English writer must have a reason to use There expletive in this sentence instead of just saying 'one of their sisters is sitting down' so the reason should be considered.

2.4. The reflection status of end-focus in English-Korean translations[11]

In the previous studies, it is found out that more than 50% of There construction carries negative words or quantifiers and the translations patterns on that is different by translators. In

this study, the same translations are analyzed to see if there is difference between translations with negatives and quantifiers, and the difference is statistically meaningful. The first analysis result on the reflection status of negative end-focus is shown in <Table 4>.

Table 4. Reflection status of negatives.

		Full realization	No realization	Total
TT1	n	64	16	80
	%	80.0	20.0	100.0
TT2	n	61	19	80
	%	76.3	23.8	100.0
TT3	n	54	26	80
	%	67.5	32.5	100.0
Average	n	179	61	240
	%	74.6	25.4	100.0

Note: χ 2=3.473, p=0.176.

After the cross analysis process, there is no statistically meaningful difference on the reflection status of negative words realization among three translations. In other words, the translation patterns of three translators are almost same on how to realize the negative end-focus, even though the third target text shows the least conformity with the source text. Next is the reflection status of quantifiers.

Table 5. Reflection status of quantifiers.

		Full realization	No realization	Total
TT1	n	70	8	78
	%	89.7	10.3	100.0
TT2	n	71	7	78
	%	91.0	9.0	100.0
TT3	n	65	13	78
	%	83.3	16.7	100.0
Average	n	206	28	234
	%	88.0	12.0	100.0

Note: χ 2=2.515, p=0.284.

In terms of the cross analysis of quantifier end-focus realization, there is also no statistically meaningful difference among three translations, either. In this part, TT3 translation does not fully realize the end-focus compared to other two translations, however, numerical value is in error range. Next is the significance testing result between negative and quantifier end-focus realization.

Table 6. Significance testing result.

		Full realization	No realization	Total
Negatives	n	45	35	80
	%	56.3	43.7	100.0

Quantifi-ers	n	60	18	78
	%	76.9	23.1	100.0
Average	n	105	53	158
	%	66.5	33.5	100.0

Note: χ 2=7.572, p=0.006.

The data result is statistically meaningful in <Table 6>. It means that there is a clear difference between negative and quantifier sentence translation. In all the three translation texts, There sentences with quantifiers are more end-focus realized close to the source text than those with negative words. This is probably due to the fact that there are more variables of verb translation than noun. Negative words in English have more versions than quantifiers in English into Korean translation.

Even though this study does not provide any noticeable reasons and sufficient back up data for this difference, one thing clear is that negatives and quantifiers play an pivotal role in English There construction.

3. Empirical Studies

3.1. Acquisition level of information structure[15]

The first study of acquisition level is about information structure sentences among 17 of 87 university freshmen who showed over 50% of correct answers on the pretest. There are two times answering questions on There sentences, passives and inversion, all of which are representative constructions of information structure. The number of questions for each construction is 3 and 9 in total. All the questions conducted pre-screening by 3 native speakers from America, Island and South Africa. Followed is example questions.

Table 7. Example questions on 3 constructions.

	Example questions
There [16]	**Choose A or B to fill in the blank.** Once upon a time, there was a mother duck. She lived on a farm and spent her days sitting on her nest of eggs. One morning, the eggs began to move and out came six little ducklings. But ( ) and it didn't hatch. The mother didn't remember this egg. "I thought I had only six," she said. "But maybe I counted incorrectly." A short time later, the seventh egg hatched. But this duckling had gray feathers, not brown like his brothers, and was quite ugly. His mother thought, "Maybe this duck isn't one of mine." He grew faster than his brothers and ate more food. He was very clumsy, and none of the other animals wanted to play with him. Much of the time he was alone. He wandered alone most of the winter and finally found a comfortable bed of reeds in a pond. He thought to himself, "No one wants me. I'll just hide here for the rest of my life." ( ) and although he was lonely, he felt a little happier. **1.1 A. there was one egg that was bigger than the rest,** **B. one egg was bigger than the rest,** **1.2 A. There was plenty of food there,** **B. Plenty of food was there,**
Passives [17]	The next time that Ginger and I were together in the paddock, she told me about her first place. 'After my breaking in', she said, '( ) to match another chestnut horse. For some weeks he drove us together, and then we were sold to a fashionable gentleman, and were sent up to London. **A. I was bought by a dealer.**

	B. A dealer bought me.
Inversion [18]	Maria: I'm looking for my friend Rose. Benedict: ( ) **A. Among the guests of honor was sitting Rose.** **B. Rose was sitting among the guests of honor.**

When the participants are asked to answer the question, they choose one option of the two. The right answer is A in every question. After they finish the test, they have 10 times of study on the basic notion of information structure and then, they have the second test with the same questions from the first test. The data is analyzed on whether there is any difference between the first and the second test results and the difference is statistically meaningful or not. The result is as shown in the following <Table 8>.

Table 8. The p-value on the two acquisition tests.

Sentence type	Mean difference	T	Df	P-value
There	0.098	1.218	16	0.229
Passive	0.294	3.125	16	0.003
Inversion	0.412	4.609	16	0.000

Note: *p<.05.

After finishing the second test, the participants make better scores on all the three types of sentences. It shows that the basic notion of information structure is not difficult to learn and the lower acquisition level in the first test is because the participants did not have any chance to real learn the notion. However, the level of acquisition on the There existential sentences is not increased statistically meaningful, which means that it is more difficult for the learners to understand There sentence than the other two sentences. This result leads to the other acquisition level study on There construction.

3.2. Acquisition level of there construction[9]

Based on the study result that the learners' acquisition level is lower in There construction than other information structure sentences, this acquisition study focuses on There existential sentence. In this study, there are 75 university freshmen in Kangwon province and they answer 12 questions on the existential sentences. The questions are divided into 3 parts; the sentences with negative words, quantifiers and etc., and each type has 4 questions. <Table 9> shows examples of each category[1].

Table 9. Example questions on 3 categories.

	Example questions
Negatives	Jack: Get in the boat, Rose! Rose: Not without you! Jack: I'll be all right. (Rose takes the last place on the lifeboat.) Cai: I lied. I've made no arrangement for you, Jack. Rose: How foolish I was to believe Cai. ( )

[1] Corpus of Contemporary American English(COCA)(english-corpora.org).

	A. There will be no boat for Jack! B. No boat will be for Jack!
Quantifiers	(Dad is doing paperwork.) Dad: ( ) Kelly: Can you pay them? Dad: Barely. But I'll figure something out. Kelly: Or else you'll just leave, right? Dad: I really want to reopen this zoo, Kelly. I just don't know if I can do it. A. There are so many bills. B. So many bills are there.
Etc.	I looked at the piano keys in front of me. At that moment, I didn't want to play anything. I just wanted to shrink into one of the black buttons on the piano bench and run away. ( ) as everyone sat, waiting for me. A. There was a loud silence in the room B. A loud silence was in the room

Each question has two options; A and B, and A is the right answer for every question. After the survey, the participants' level of acquisition according to the category is shown in <Table 10>.

Table 10. The acquisition level by categories.

Category	N	Mean	Sd
Negatives	75	2.234	1.071
Quantifiers	75	2.666	1.031
Etc.	75	2.226	.909

The category showing the highest level of acquisition is There sentences with quantifiers. This is the same result with the one about the data analysis on English-Korean translations. It means that There sentences with negatives should be more focused on for both translation and education.

4. Conclusion

Based on the research data analyses, it is shown that English speakers or writers use There existential sentences for their own purpose to stress the non-existence or the certain quantity of a noun at the end of the sentence. It is true from all the data in two English novels, one Korean-English novel and three English-Korean translations. However, this has not been seriously considered in both education and translation.

Also, the empirical studies show that the notion of information structure is not difficult nor need much time for learners to understand. Thus, in terms of There construction education and translation, the negative particles should be more focused than others.

The purpose of this review study is to stress of the importance of information structure and give some guidelines on teaching and translating There existential sentence which is one of the marked constructions of information structure. There has been various changes in learning and teaching method[19][20][21][22][23] in education but the contents are still the same. Even though all the data from the studies summarized here is not yet sufficient, it is enough for this review to be the first step for more and detailed studies to change the contents.

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6. Appendix

6.1. Authors contribution

	Initial name	Contribution
Author	SS	-Set of concepts ☑ -Design ☑ -Getting results ☑ -Analysis ☑ -Make a significant contribution to collection ☑ -Final approval of the paper ☑ -Corresponding ☑ -Play a decisive role in modification ☑ -Significant contributions to concepts, designs, practices, analysis and interpretation of data ☑ -Participants in Drafting and Revising Papers ☑ -Someone who can explain all aspects of the paper ☑

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Analysis of Green Area Ratio by Industrial Complex Type to Minimize DEFORESTATION

Changjun Kim[1]
Daegu Haany University, Gyeongsan, Republic of Korea
Hyangju Lee[2*]
Daegu Haany University, Gyeongsan, Republic of Korea
Wonhyeon Lim[3]
Daegu Haany University, Gyeongsan, Republic of Korea

Abstract

Purpose: *As the economy grows, many forests, fields, and agricultural land have been converted into industrial complexes. Accordingly, there are deep concerns about damage to the natural ecosystem and environmental impact. This study analyzed the factors related to the natural environment by type for industrial complexes promoted in forest areas. The authors hope to balance development and conservation by identifying the relationship between factors related to the natural environment. In addition, this study tried to derive rational ways to develop industrial complexes suitable for low-carbon green growth.*

Method: *This study was analyzed based on 95 environmental impact assessments that business operators applied for consultation with agencies concerned to build industrial complexes in Daegu and Gyeongbuk, Korea, for 16 years from 2005 to 2020. The researchers conducted a one-way ANOVA analysis to determine the difference in green area ratio, forest field ratio, tree transplantation ratio, and ecological area ratio by industrial complex type . Post-hoc analysis was performed by the Scheffe test. This paper used the Spss Statistics 21 statistics program to conduct the above statistical analysis.*

Results: *The number of consultations for industrial complexes was highest for general industrial complexes. The green area ratio was 5.60% higher in national industrial complexes than in agricultural and industrial complexes. The forest field ratio was 71.84% in quasi-industrial complexes, 40.14% higher than 31.70% in quasi-agro-industrial complexes. The tree transplantation ratio was low in national industrial complexes and quasi-industrial complexes. The ecological area ratio decreased by 72.93% after development compared to before development in general industrial complexes and decreased by 65.75% after development compared to before development in national industrial complexes.*

Conclusion: *Before the industrial complex development, the forest field ratio showed differences by type. However, there was no difference in the ecological area ratio after the development of the industrial complex. This result was seen as the minimum standard set by law in parks and green areas. Therefore, it is necessary to develop eco-friendly industrial complexes rather than reckless development to minimize forest damage. The authors believe it is necessary to respond to climate change and contribute to low-carbon green growth by minimizing the forest area within the development area and increasing the ecological area ratio and tree transplantation ratio after development.*

[Keywords] ***Industrial Complex, Deforestation, Green Area Ratio, Ecological Area Ratio, Green Growth***

1. Introduction

In Korea, about 63.4% of the land is composed of forests. According to the Korea Forest Service statistics, as of 2019, Korea's total area of forests is 6,363,549ha. About 70% of Gyeongsangbuk-do is forested, and it is the second-highest forest ratio in the country after Gangwon-do[1]. These data indicate that the available land to be developed, such as residential, commercial, and industrial land, is limited within the national land. In particular, Gangwon-do and

Gyeongsangbuk-do regions include Mt. Seorak, Mt. Chiak, and Mt. Sobaek, which are the origins of the Baekdu-daegan nicknamed the "spine of the Korean Peninsula." So, the two regions are facing many difficulties[2].

Since the early 2000s, the need for urban development projects has been raised in Korea due to the lack of housing. In addition to the Housing Site Development Promotion Act, which has been in effect since 1981, many housing projects have been implemented to enforce the Act on Special Measures for National Rental Housing Construction(July 2004)[3]. From the mid-2000s, the development of factories and industrial complexes for economic growth was actively promoted, and in 2008, the Special Act was enacted and implemented to simplify the procedure. Accordingly, the country tried to achieve economic growth with the increased industrial complexes by reducing the existing industrial complex licensing process from more than two years to one year[4][5]. As a result, the number of industrial complexes rapidly increased from 587 nationwide in 2008 to 1,074 in 2014, resulting in steady economic growth. Many forests and agricultural lands, which were high proportions of the country's land-use status, have changed to industrial complexes in development sites[2][6][7]. There were increased concerns about environmental impacts such as damage to natural ecosystems due to intensive land use following steady economic growth. To respond to climate change, a growing international problem, Korea established a legal and institutional foundation by establishing a five-year green growth plan(July 2009) and enacting the Framework Act on Low Carbon, Green Growth(January 2010). The government has reduced greenhouse gas emissions by setting national greenhouse gas reduction goals and establishing reduction plans for each sector[2][8].

The purpose of this Act is to promote the development of the national economy by laying the foundation necessary for low carbon, green growth and by utilizing green technology and green industries as new growth engines, so as to pursue the harmonized development of the economy and environment and to contribute to the improvement of the quality of life of every citizen and the take-off to a mature, top-class, advanced country that shall fulfill its responsibility in international society through the realization of a low-carbon society[9][10].

Along with economic growth, recently, the government is trying to achieve low-carbon green growth with eco-friendly development and conservation plans to reduce greenhouse gas emissions and respond to climate change, basing on the Framework Act on Low Carbon, Green Growth. Traditionally, in land use in urban, landscape design, and civil engineering design, there are more cases of considering land compartment rearrangement for industrial complexes than considering the surrounding environment and situation[11][12]. In other words, many complexes are established in consideration of the efficiency of engineering works for zoning and the economic efficiency in respect of land prices. Recently, the concept of industrial growth centered on low-carbon and green industries, which simultaneously pursue environmental conservation and economic development, has been introduced[13][14][15]. The natural environment plays a vital role in improving the quality of life with a change in the public's perception that designers should reflect a plan considering the environment in the design[16].

The environmental impact assessment also acts as the last bastion of ecological conservation by inducing eco-friendly plans where nature and humans coexist and development and protection are harmoniously balanced rather than one-sided development plans. However, we should not think that environmental impact assessment can solve everything. Moreover, EIS cannot solve everything perfectly. For this reason, lately, long-term and continuous construction for ecological data are required[17][18][19].

The researchers analyzed the factors related to the natural environment by industrial complex type, which have been promoted in forested areas due to the lack of development land.

The purpose of this study is to identify the relationship between factors related to the natural environment and to derive rational plans for developing industrial complexes that balance development and conservation and revive low-carbon green growth.

2. Methods

2.1. Gathering data

The target sites of this study were in 95 statements of environmental impact assessment that business operators applied for consultation with consulting institutions to build industrial complexes in Daegu and Gyeongbuk for 16 years from 2005 to 2020. At that time, 2005 was when the necessity of development began to be raised for reasons of economic growth. This paper extracted the data from the environmental impact assessment reports for the industrial complexes in the Environmental Impact Assessment Support System(www.eiass.go.kr) and investigated them[20][21].

As for the number of industrial complex consultations by type, the general industrial complex was the highest, with 56 cases(58.9%). There were 17 cases(17.9%) for quasi-industrial complexes, 11 cases(11.6%) for agricultural and industrial complexes, and 7 cases(7.4%) for quasi-agro-industrial complexes. The national industrial complex was the lowest with 4 cases(4.2%) <Table 1>.

Table 1. Number of subjects studied.

Target index / Type	Number	Ratio
National industrial complex	4	4.2
General industrial complex	56	58.9
Agricultural and industrial complex	11	11.6
Quasi-industrial complex	17	17.9
Quasi-agricultural & industrial complex	7	7.4
Total	95	100

2.2. Data analysis

The researchers analyzed the 95 evaluation papers surveyed during industrial complexes' environmental impact assessment process from 2005 to 2020. The green area ratio was the ratio of green area to an industrial complex area. This study analyzed the ratio of green areas such as parks, slope green areas, and buffer green areas by classifying them by industrial complex type. The forest field ratio was the ratio of forest fields to industrial complex areas. This study analyzed the ratio of forest fields within land categories by classifying them by industrial complex type. The tree transplant ratio was the ratio of the number of trees reused in the parks and green spaces in the industrial complex to the number of trees damaged by the construction of the industrial complex. This study analyzed the ratio of tree transplants by classifying them by industrial complex type. Before and after development, the ecological area ratio was the ratio of the soil area with natural circulation function. This study analyzed the ratio of the ecological areas before and after development by classifying them by industrial complex type.

The researchers conducted a one-way ANOVA analysis to investigate the difference in green area ratio, forest area ratio, and tree transplantation ratio by type of industrial complex and determine the difference in ecological area ratio before and after development by type. Post-hoc analysis was performed by the Scheffe test. This study used the Spss Statistics 21 statistics program to conduct the above statistical analysis.

3. Results & Discussion

3.1. Analysis of green area ratio

<Table 2> shows the results of one-way ANOVA analysis to find out the difference in green area ratio by industrial complex type.

As a result of checking the F value and the significance probability for the green area ratio, it was found that F=0.662, p=0.620. There was no difference in the green area ratio by type.

Table 2. ANOVA analysis on green area ratio by Industrial complex type.

One-way ANOVA analysis					
Division	Sum of squares	df	Mean square	F	Significance probability
Between - group	98.566	4	24.641	.662	.620
Within - group	3348.842	90	37.209		
Total	3447.408	94			

Note: *p<.05, **p<.01,***p<.001.

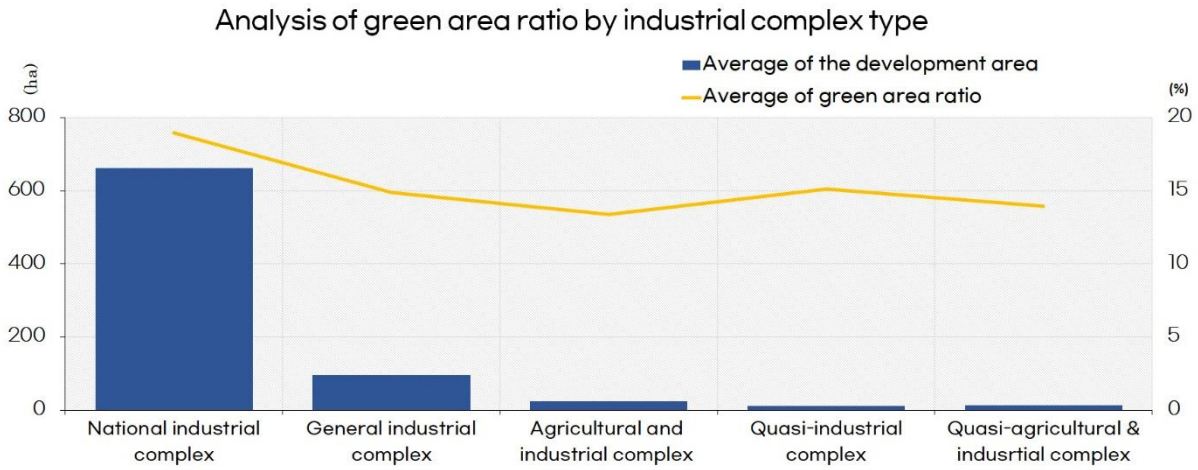
As for the number of industrial complex consultations, the general industrial complex was the highest, with 56 cases(58.9%). There were 17 cases(17.9%) in the quasi-industrial complex, 11 cases(11.6%) in the agricultural and industrial complex, and 7 cases(7.4%) in the quasi-agro-industrial complex. The national industrial complex was the lowest, with 4 cases(4.2%).

<Table 3> and <Figure 1> show the results of analyzing the green area ratio by industrial complex type. National industrial complexes accounted for 18.98%, quasi-industrial complexes 15.13%, general industrial complexes 14.89%, quasi-agro-industrial complexes 13.97%, and agricultural and industrial complexes 13.38%. Many industrial complex consultations were conducted with general industrial complexes, and the green area ratio was the highest in national industrial complexes. This paper analyzed that the discussions on environmental impact assessment were conducted more broadly than the legal standard.

Table 3. Analysis of green area ratio by industrial complex type.

Type	N	Average of the development area	Average of green area ratio	Standard deviation	Legal standard
National industrial complex	4	6,615,992	18.98	3.3530	More than 300 million square meters : 10%-13%
General industrial complex	56	964,344	14.89	5.3018	
Agricultural and industrial complex	11	249,956	13.38	9.1975	More than 100 million square meters - 300 million square meters : 7.5%-10%
Quasi-industrial complex	17	115,164	15.13	5.6680	
Quasi-agricultural & industrial complex	7	125,624	13.97	8.2581	Less than 100 million square meters : 5%-7.5%
Total	95	905,831	14.86	6.0560	

Figure 1. Analysis graph of green area ratio by industrial complex type.



3.2. Analysis of forest field ratio

<Table 4> shows the results of one-way ANOVA analysis to find out the difference in forest field ratio by industrial complex type. As a result of checking the F value and the significance probability for the forest field ratio, it was found that F=3.408, p=0.012. There were differences in the forest field ratio by type.

Table 4. ANOVA analysis on forest field ratio by industrial complex type.

One-way ANOVA analysis					
Division	Sum of squares	df	Mean square	F	Significance probability
Between - group	11199.456	4	2799.864	3.408	.012*
Within - group	73933.750	90	821.486		
Total	85133.205	94			

Note: *p<.05, **p<.01,***p<.001.

As for the forest field ratio by industrial complex type, the quasi-industrial complex was the highest with 17 cases(71.84%).

There were 56 cases(56.86%) for general industrial complexes, 11 cases(44.10%) for agricultural and industrial complexes, 4 cases(38.45%) for national industrial complexes, and 7 cases(31.70%) for quasi-agro-industrial complexes.

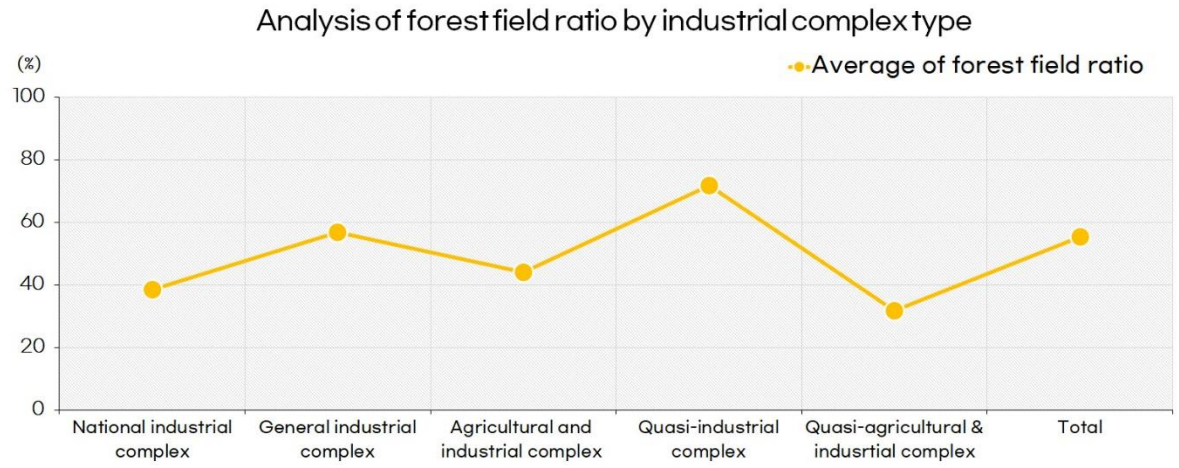
<Table 5> and <Figure 2> show the results of analyzing the forest field ratio by industrial complex type.

Table 5. Analysis of forest field ratio by industrial complex type.

Type	N	Average of forest field ratio	Standard deviation
National industrial complex	4	38.45	10.5658
General industrial complex	56	56.86	29.6639

Agricultural and industrial complex	11	44.10	30.7590
Quasi-industrial complex	17	71.84	28.1874
Quasi-agricultural & industrial complex	7	31.70	22.4654
Total	95	55.43	30.0344

Figure 2. Analysis graph of forest field ratio by industrial complex type.



3.3. Analysis of tree transplantation ratio

<Table 6> shows the results of one-way ANOVA analysis to find out the difference in tree transplantation ratio by industrial complex type. As a result of checking the F value and the significance probability for the tree transplantation ratio, it was found that F=1.052, p=0.385. There was no difference in the tree transplantation ratio by type.

Table 6. ANOVA analysis on tree transplantation ratio by industrial complex type.

One-way ANOVA analysis

Division	Sum of squares	df	Mean square	F	Significance probability
Between - group	235.544	4	58.886	1.052	.385
Within - group	5039.319	90	55.992		
Total	5274.864	94			

Note: *p<.05, **p<.01, ***p<.001.

This paper analyzed the tree transplantation ratio with the number of transplanted trees divided by the number of damaged trees.

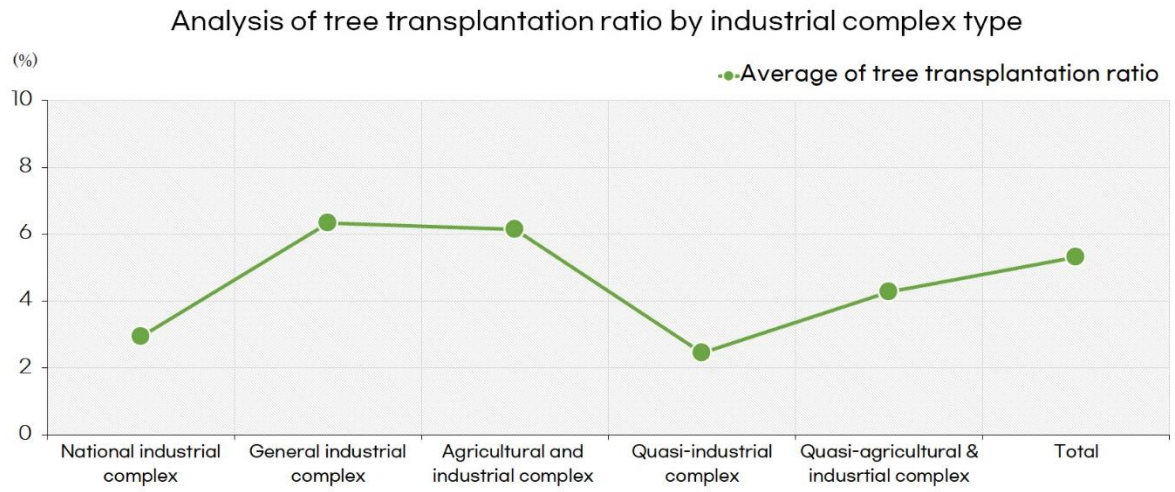
As for the tree transplantation ratio by industrial complex type, the general industrial complex was the highest, with 56 cases(6.33%). There were 11 cases(6.15%) in the agricultural and industrial complex, 7 cases(4.27%) in the quasi-agro-industrial complex, and 4 cases(2.95%) in the national industrial complex. The quasi-industrial complex was the lowest, with 17 cases(2.45%).

<Table 7> and <Figure 3> show the results of analyzing the tree transplantation ratio by industrial complex type. The tree transplantation ratio was low in national industrial complexes and quasi-industrial complexes. In order to adapt to climate change and block pollution sources in industrial complexes, it is more effective to transplant and use existing trees than to plant new trees. In other words, efforts should be made to block climate change and pollution sources in industrial complexes by increasing the tree transplantation ratio.

Table 7. Analysis of tree transplantation ratio by industrial complex type.

Type	N	Average of tree transplantation ratio	Standard deviation
National industrial complex	4	2.95	2.6652
General industrial complex	56	6.33	8.3368
Agricultural and industrial complex	11	6.15	6.7423
Quasi-industrial complex	17	2.45	3.3291
Quasi-agricultural & industrial complex	7	4.27	9.6910
Total	95	5.32	7.4910

Figure 3. Analysis graph of tree transplantation ratio by industrial complex type.



3.4. Analysis of ecological area ratio before and after development

<Table 8> shows the results of one-way ANOVA analysis to find out the difference in ecological area ratio before and after development. As a result of checking the F value and the significance probability for the ecological area ratio before development by type, it was found that F=2.714, p=0.035. There were differences in the ecological area ratio before development by type.

As a result of checking the F value and the significance probability for the ecological area ratio after development by type, it was found that F=0.615, p=0.653. There was no difference in the ecological area ratio after development by type.

Table 8. ANOVA analysis on ecological area ratio before and after development.

One-way ANOVA analysis

Division		Sum of squares	df	Mean square	F	Significance probability
Between - group	Before development	3806.627	4	951.657	2.714	.035*
	After development	143.907	4	35.977	.615	.653
Within - group	Before development	31559.331	90	350.659		
	After development	5266.514	90	58.517		
Total	Before development	35365.958	94			
	After development	5410.421	94			

Note: *p<.05, **p<.01,***p<.001.

This paper analyzed the ecological area ratio as the ratio of the soil area with natural circulation function among the total area.

<Table 9> and <Figure 4> show the results of analyzing the ecological area ratio before and after development.

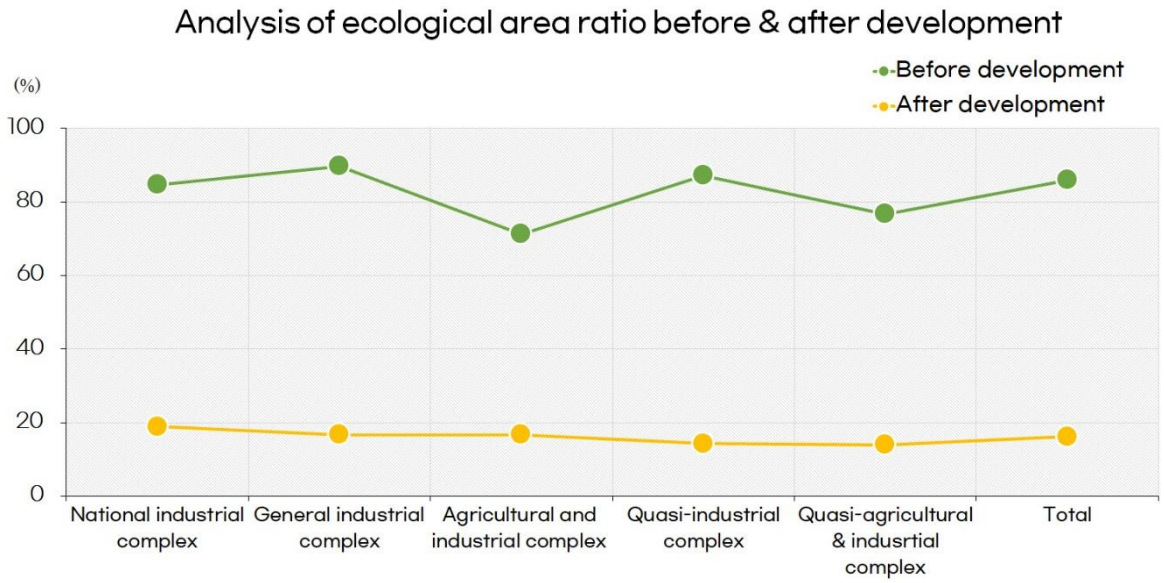
As for the ecological area ratio before development, the general industrial complex was the highest, with 56 cases(89.75%). There were 17 cases(87.18%) in the quasi-industrial complex, 4 cases(84.75%) in the national industrial complex, and 7 cases(76.71%) in the quasi-agro-industrial complex. The agricultural and industrial complex was the lowest, with 11 cases(71.27%). As for the ecological area ratio after development, the national industrial complex was the highest, with 4 cases(19.00%). There were 56 cases(16.82%) in the general industrial complex, 11 cases(16.73%) in the agricultural and industrial complex, and 17 cases(14.41%) in the quasi-industrial complex. The quasi-agro-industrial complex was the lowest, with 7 cases(14.00%).

Table 9. Analysis of ecological area ratio before and after development.

Type		N	Average of ecological area ratio	Standard deviation
National industrial complex	Before development	4	84.75	1.500
	After development	4	19.00	3.464
General industrial complex	Before development	56	89.75	12.436
	After development	56	16.82	7.257
Agricultural and industrial complex	Before development	11	71.27	29.685
	After development	11	16.73	11.507
Quasi-industrial complex	Before development	17	87.18	23.471
	After development	17	14.41	6.083
Quasi-agricultural &	Before development	7	76.71	30.054

industrial complex	After development	7	14.00	8.347
Total	Before development	95	85.98	19.397
	After development	95	16.26	7.587

Figure 4. Analysis graph of ecological area ratio before and after development.



4. Conclusion

Traditionally, in land use in urban, landscape design, and civil engineering design, there were more cases of considering land compartment rearrangement for industrial complexes than considering the surrounding environment and situation. In other words, many complexes were established in consideration of the efficiency of engineering works for zoning and the economic efficiency in respect of land prices[2][22]. Recently, the concept of industrial growth centered on low-carbon and green industries, which simultaneously pursue environmental conservation and economic development, has been introduced. The natural environment plays a vital role in improving the quality of life with a change in the public's perception that designers should consider the environment in the design[2][23].

Therefore, this paper analyzed the differences in green area ratio, forest field ratio, tree transplantation ratio, and ecological area ratio before and after development by industrial complex type, based on the environmental impact assessment projects of 95 cases for industrial complexes from 2005 to 2020.

The researchers tried to contribute to developing industrial complexes that revive low-carbon green growth and economic expansion.

The contents of this study were summarized as follows.

First, as for the number of industrial complex consultations, the general industrial complex had the most significant number of 56 cases(58.9%). Moreover, 17 cases(17.9%) for quasi-industrial complexes, 11 cases for agricultural and industrial complexes(11.6%), and 7 cases for quasi-agro-industrial complexes(7.4%) were in that order. National industrial complexes were the least with 4 cases(4.2%). The results of analyzing the green area ratio by type of industrial complex were 18.98% for national industrial complexes, 15.13% for quasi-industrial complexes, 14.89% for general industrial complexes, 13.97% for quasi-agro-industrial complexes, and 13.38%

for agricultural and industrial complexes. Many industrial complex consultations were conducted with general industrial complexes, and the green area ratio was the highest in national industrial complexes. This paper analyzed that the discussions on environmental impact assessment were conducted more broadly than the legal standard.

Second, as for the forest field ratio by industrial complex type, quasi-industrial complexes accounted for the most at 71.84%, followed by general industrial complexes with 56.86%, agricultural and industrial complexes with 44.10%, national industrial complexes with 38.45%, and quasi-agro-industrial complexes with 31.70%. As a result of checking the F value and the significance probability for the forest field ratio, it was found that F=3.408, p=0.012. There were differences in the forest field ratio by type.

Third, the tree transplantation ratio by industrial complex type was the highest at 6.33% in general industrial complexes, followed by 6.15% in agricultural and industrial complexes, 4.27% in quasi-agro-industrial complexes, 2.95% in national industrial complexes, and 2.45% in quasi-industrial complexes. The tree transplantation ratio was low in national industrial complexes and quasi-industrial complexes. In order to adapt to climate change and block pollution sources in industrial complexes, it is more effective to transplant and use existing trees than to plant new trees. Therefore, efforts should be made to block climate change and pollution sources in industrial complexes by increasing the tree transplantation ratio.

Fourth, as for the ecological area ratio before development, general industrial complexes accounted for 89.75%, quasi-industrial complexes accounted for 87.18%, national industrial complexes accounted for 84.75%, quasi-agro-industrial complexes accounted for 76.71%, and agricultural and industrial complexes accounted for 71.27%. As a result of checking the F value and the significance probability for the ecological area ratio before development by type, it was found that F=2.714, p=0.035. There were differences in the ecological area ratio before development by type.

Fifth, as for the ecological area ratio after development, national industrial complexes accounted for 19.00%, general industrial complexes accounted for 16.82%, agricultural and industrial complexes accounted for 16.73%, quasi-industrial complexes accounted for 14.41%, and quasi-agro-industrial complexes accounted for 14.00%.

Combining the results of this study, the ratio of forest fields before the development of the industrial complex showed a difference by type. However, there was no difference in the ratio of the ecological area after the development of the industrial complex.

This result was seen as the minimum standard set by law in parks and green areas. Therefore, it is necessary to develop eco-friendly industrial complexes rather than reckless development to minimize forest damage. The authors believe it is necessary to respond to climate change and contribute to low-carbon green growth by minimizing the forest area within the development area and increasing the ecological area ratio and tree transplantation ratio after development.

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6. Appendix

6.1. Authors contribution

	Initial name	Contribution
Lead Author	CK	-Set of concepts ☑ -Design ☑ -Getting results ☑ -Analysis ☑
Corresponding Author*	HL	-Make a significant contribution to collection ☑ -Final approval of the paper ☑ -Corresponding ☑ -Play a decisive role in modification ☑
Co-Author	WL	-Significant contributions to concepts, designs, practices, analysis and interpretation of data ☑ -Participants in Drafting and Revising Papers ☑ -Someone who can explain all aspects of the paper ☑

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Analysis of the PUBLIC VALUE of Celebrity Hair Color Trend in Milbon Collection

Jinhua Han[1]
Joongbu University, Geumsan, Republic of Korea
Jihee Kim[2]
Joongbu University, Geumsan, Republic of Korea
Mija Cho[3*]
Joongbu University, Geumsan, Republic of Korea

Abstract

Purpose: *'Hairstyles express visual beauty, so images can be perceived differently. This study conducted a study on Milbon's color hair dye that can create public value through changes in appearance according to hair color. Although there are many studies related to brands such as Wella, Amos, and L'Oreal in the preceding studies related to hair color trends, the current research related to Milbon is very insufficient.*

Method: *The characteristics of S/S and F/W Milbone hair trends from 2016 to 2019 were examined, and the color trend of Milbone was analyzed by examining prior research and Internet data. For the empirical method, 500 photos of actresses who appeared in dramas aired from 2016 to 2019 were collected based on 8 colors of the Milbone color trend, and the final 24 photos were selected and analyzed among 40 photos about hair color and Milbone color trend.*

Results: *As a result of analyzing through an empirical method based on the consideration of previous studies, 2016 expressed softness in a natural atmosphere, healthy and strong, 2017 expressed sophistication that can add natural and modernity, and 2018 It expresses a casual atmosphere and beautiful dignity. And 2019 expressed luxury, maturity, and conservative but stylish.*

Conclusion: *It was found that the hair color of the celebrities who appeared in the selected drama best expressed the image and feeling from the concept, texture, and hair color appearing in the Milborn color trend. As a result of comparative analysis from a subjective point of view, there is a limit to securing universality, and we hope that there will be follow-up studies on hair color trends in the future, and we want to become a cornerstone of data that can be used by predicting future hair trends.*

[Keywords] ***Milbon, Color Trend, Hair Style, Hair Color, Beauty Trend***

1. Introduction

This is the 4th Industrial Age, and rapid development in the social, cultural, economic, and scientific fields is taking place, and various information is changing rapidly in the art fields according to the trend of the information age[1][2][3]. In the 21st century, various trends are created according to changes in social structure and environment as a part of the overall cultural phenomenon, and political, economic, social, and cultural factors are influencing the mainstream of trend change[4]. Among these factors, hairstyles are most closely related to trends as consumers' interest in lifestyle and beauty increases due to increased income and improved living conditions[5][6][7], and an influencer is a person who drives the trend in response to these factors.

The human desire for beauty is accelerating as times change, and public value is a public service performed to maximize the value that goes to the public. Public values should be created, including the economy, politics, culture, art, etc. and be able to create public values in beauty

in various ways as well[8]. In particular, hairstyles can play an important role in determining one's appearance by expressing visual beauty through changes in appearance according to hair color and can compensate for the shortcomings and emphasize the forte of appearance through hair design[9][10][11][12]. Hair trends are constantly changing as mirrors reflecting the times and social phenomena, so it is characterized by great variability. In general, hair trends are future-oriented in that they mean changes and trends and present the whole direction of trends to move forward. It is also believed that hair trends and appearances are closely related because they are influenced by social, economic, and cultural factors[5].

Han Man-seok and Kim Young-sam said in their study that the formation of modern women's images needs to create more self-efficacy and positive likability by creating overall harmony by producing hairstyles[13]. Kim Eun-jin's research suggests that appearance is often used as a means of social life to create first impressions and enhance one's image beyond one's own satisfaction[14].

One's hairstyle has a lot of influence as one of the various physical appearance variables, and it becomes a means of expressing individuality as the information society develops and society opens through the Internet and is becoming more prominent amid rapid trends and continuous changes due to the spread of mass media[15][16]. Also, modern people want to express their individuality by presenting their image positively through hair color, and the hair color that makes this hairstyle stand out is the biggest factor in image change[17]. In hair style, color can be identified from any position, so visual intuition is important because afterimages appear more directly than other organs[18]. In particular, celebrities are influencers, who lead beauty trends, and hair designers need to analyze accurate information about celebrities' hairstyles and perform systematic research on changes in celebrities' hairstyles year by year[14].

Preceding studies include "A Study on the Analysis of Hair Color Trend Shown in L'Oreal, Amos and Wella Company Collection(Year 2006-2012),"[19] "A Study on Gradation Coloring Technique Expressed in Hair Trends,"[20] and "A Study on the Hair Trend of domestic and foreign Beauty a Industry(Year 2006-2013)"[21]. While studies on color trends led by Wella, L'Oreal, and Amos have been steadily conducted, studies on color trends by Milbon are insufficient. Recently, interest in public values has been increasing in all fields, such as education, culture and art, and although the public values in each field are different, Milbon provides an instrumental role for the public based on the public value of science[22][23].

Therefore, based on the flow of hair trends, the researcher intends to broaden one's understanding of new colors and seek empirical areas of hairstyle trends by examining and analyzing the characteristics of S/S and F/W Milbon hair trends from 2016 to 2019.

2. Theoretical Background

2.1. Definition of "trend"

The general meaning of trend is "tendency, fluctuation, trend, fad," indicating a forthcoming tendency of fashion. In the etymology, it is believed to have originated from a wagon wheel, which is made from cutting "Truncus," which is a Latin word, meaning "tree trunk," or the English word "Trunk." There is also a view that it is originated from a medieval English word "Trunden," meaning "to turn." Both of these views have the meaning of "to turn," implying movement. The general meaning of the word "trend" today is "tracking on a tendency," including setting a course based on that tracked direction and presenting future directions, and meaning of movement, mainstream, tendency, and trend[24][25].

Trends are used as beauty trends, fashion trends, consumer trends, marketing trends, and management trends that cover subconcept trends in a particular field, and trends mean future-oriented nuances in harmony with nouns that are modified rather than represent specific meanings. Trends can also be categorized over time, with micro trends representing small changes that consumers sympathize with for the shortest period of time, and fad trends mostly

represent relatively short-lived changes and trends within a year. And trends mean movements that last from one to five years, design trends last three to five years, and megatrends last more than 10 years[26][27].

2.2. Milbon brand

In 1960, the company was established to manufacture and sell cold perm products and shampoo, and in 1965 it changed its name to Milbon, Inc. Milbon launched the field person strategy in 1984 and its own Target Authority Customer(TAC) product development system in 1988. It was designated as the 1st tier market of the Tokyo Stock Exchange in 2001, released fashion color products Ordeve in Korea in 2008, and established Milbon Korea in 2009, gradually expanding to various parts of Korea.

Its brand concept is represented in the slogan "Opening a New Horizons of Beauty," and it has the Target Authority Customer System, its own development system, to always aim for the highest quality. The Milbon Quality is the ultimate goal, and the Fragrance is a "scent" that is deeply related to one's memories. The Milbon scent, which is supported by customers, gives freshness when rinsing the hair, stabilizes when falling asleep, and changes into a fresh scent the next morning[28].

2.3. Milbon color trend

2.3.1. 2016 S/S lumiere line

The lumiere line has a champagne-esque depth that feels glossy, light, and tough in softness, and the gloss stands out even more in low brightness. Even if you tone down, the transparency shows the color of your skin clear, maintaining the soft texture of an “foreigner-like” feeling, and the movement of the highlights was also expressed more clearly.

2.3.2. 2016 F/W healthy line

The healthy line is a hair color that adds refinement to the healthy beauty of foreigners' virgin hair and is a cold beige color that suppresses red light, allowing smooth and soft hair to be expressed in a rough but elegant way.

2.3.3. 2017 S/S noble line

Noble line is a hair color that has both spring and summer-like cuteness and natural sophistication. Two line-ups based on personal colors have been consistently expressed in one color by beautifully expressing the skin color, and in autumn, it has been expressed appropriately to change the image with a soft color.

2.3.4. 2017 F/W mode line

Mode line is a highly fashionable hair color that can add subtle modernity. High-chroma blue color can be used to remove red light while expressing a soft texture, and the hair color is expressed as transparent and glossy at the same time.

2.3.5. 2018 S/S french sepia ash line

The french sepia ash line is a color of dense gloss that can add a layer of quality and is expressed in a cold color that is completely glossy to the ends of the hair, expressing the transparency of the savon veil as well as the lightness.

2.3.6. 2018 F/W french mauve ash line

The french mauve ash line is a savon veil that realizes a light, glossy color, and is a French color that can express a dignified casual atmosphere. It expresses a natural and relaxed atmosphere and a light, glossy color that is not only casual but also beautiful.

2.3.7. 2019 S/S foggy line

The foggy line is a charcoal color that makes smooth greige look luxurious and suits everyone. This allows for a non-excessive gray-colored representation, both more glossy and softer than the ash colors.

2.3.8. 2019 F/W neo vintage line

Neo vintage line is a rich khaki color that creates depth and softness compatible with deep greige. It is a greige color that suits the skin and does not stand out in the surrounding environment. It is expressed as a khaki color suitable for women with conservative fashion tendencies.

The contents above[28] are summarized in <Table 1> as follows.

Table 1. Milbon color trend.

Year	Season	Color trend	Image	Remarks
2016	S/S	Lumiere line		Glossy and light, deep low brightness, transparency and cleanliness, soft texture
	F/W	Healthy line		Healthy beauty and refinement, smoothness and softness, elegance
2017	S/S	Noble line		Bright cuteness, natural sophistication, and soft color that makes skin color beautiful
	F/W	Mode line		Subtle modernity, eliminates red light, soft texture, transparency and gloss
2018	S/S	French sepia ash line		Add more quality, deep and glossy color, lightness, transparency
	F/W	French mauve ash line		Light, transparent, glossy, red-eliminating glossy light cold color
2019	S/S	Foggy line		Smooth, luxurious, suits everyone, glossy and soft

	F/W	Neo vintage line		Deep and soft, goes well with the skin, creating a stylish look

3. Contents and Method

This study collected basic data on S/S and F/W hair colors that appeared in the Milbon collection as the design trend lasted 3 to 5 years through Milbon Korea from 2016 to 2019[28] and analyzed the hair color that provides services for the public based on public values[29] by examining references such as previous studies and Internet site data.

This study examines the concepts and color trends of Milbon brands and examines prior studies based on them. As an empirical method, it collected eight colors in Milbon color trends and 500 pictures of actresses appearing in Korean TV shows from 2016 to 2019. Five designers currently working at hair salons participated in selecting 24 photos that had the most similar hair colors to Milbon color trends among 40 photos of the actresses, which was analyzed for the study.

4. Consideration and Results

4.1. Analysis of celebrity hair colors in 2016

In 2016, S/S Lumiere Line hair colors include Song Hye-kyo, who starred in the drama "Descendants of the Sun," Nam Gyu-ri, who appeared in "Yes, It Is," and Kim Yu-ri, who starred in "Marriage Contract." It added elegance and created a natural atmosphere. The color of the skin was clearly expressed and the toughness in softness was represented, and the lightness, depth, and gloss in low brightness were also expressed.

The hair colors of the 2016 F/W Healthy Line are those of Ryu Hwa-young, who starred in the TV drama "Hello, My Twenties!," Kim So-eun, who starred in "Our Gab Soon," and Kim Hyun-sook, who starred in "Rude Miss Young Ae." The natural beauty of the hair is further refined, adding a unique softness of the cold color and a subtle depth suitable for autumn and winter. And it is expressed roughly with smooth, soft hair, adding refinement to healthy beauty.

4.2. Celebrity hair color following the 2017 trend color

The hair colors of S/S Noble Line in 2017 are those of Ko So-young, who starred in "Ms. Perfect," Kim Eun-seo, who starred in "That Woman's Sea," and Lee Hye-sook, who starred in "Bokdanji is back." It has both a creamy soft glow, bright cuteness, and natural sophistication. And the skin color was expressed in a natural yet beautiful and soft image.

The 2017 F/W Mode Line hair colors are those worn by Lim Sang-mi, who starred in the drama "Save Me," Yoon Da-young, who starred in "Blossom Dalsoon," and Han Seung-yeon, who starred in "Hello, My Twenties! 2 ." They simultaneously realized the soft texture and cold color that would suit Asians and drew a subtle and modern image of any style. These are fashionable hair colors that can add modernity and are high-chroma blue color, which removes redness to express soft texture, transparency, and gloss.

4.3. Celebrity hair color following the 2018 trend color

The hair colors of S/S French Sepia Ash Line in 2018 are those of Park Min-young, who starred in the drama "What's Wrong with Secretary Kim," Lee Sung-kyung, who starred in "About Time," and Kim So-hyun, who appeared in "Radio Romance." It is a French color that can express a casual, but classy,

atmosphere, drawing the image of a mature woman. The lightness, transparency, as with the surface of soap bubbles, expressed a much higher concentration of deep gloss.

The 2018 F/W French Mauve Ash hair colors are those of Chae Soo-bin, who starred in "Where Stars Land," Kim Yoo-jung, who starred in "Clean With Passion For Now," and Baek Jin-hee, who starred in "Feel Good To Die." Glossy light cold colors are not only casual but also perfectly beautiful, creating a new style of image. It is a cold light red-purple-ish white color that suppresses yellowish color, expressing a natural, relaxed, and glossy look to the ends of the hair with elegant casualties as with the surface of soap bubbles.

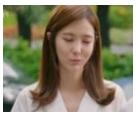
4.4. Celebrity hair color following the 2019 trend color

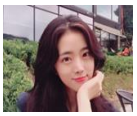
The 2019 Foggy Line hair colors are those of actress Lee Ji-eun, who starred in the drama "Hotel DelLuna," Seo Hyun-jin, who starred in "Black Dog," and Song Hye-kyo, who starred in "Boyfriend." It has a relaxed and balanced base with a glossy and soft image. They are luxurious and everyone's favorite charcoal and gray colors, which add more gloss and softness to the ash color to express mature femininity.

The 2019 F/W Neo Vintage Line hair colors are those of Son Ye-jin, who starred in the drama "Crash Landing on You," Im Soo-jung, who starred in "Please Enter a Search Term," and Gong Hyo-jin, who starred in "When the Camellia Blooms." The rich khaki color makes deep greige, and it brings out a conservative yet stylish image. The color goes well with the skin with its depth and softness and expresses a stylish greige feeling that does not stand out.

The contents above are summarized in <Table 2> as follows.

Table 2. Celebrity hair color year-by-year.

Year	2016						
Season	S/S			Season	F/W		
Name	Song Hye-kyo	Nam Gyu-ri	Kim Yu-ri	Name	Ryu Hwa-young	Kim So-eun	Kim Hyun-sook
TV drama	Descendants of the sun	Yes it is	Marriage contract	TV drama	Hello, my twenties!	Our gab soon	Rude miss young ae
Lumiere line				Healthy line			
Site address	https://m.blognaver.com	https://www.pintest.ph/pin	https://www.hankyung.com	Site address	https://www.dipatch.co.kr	https://www.fashionn.com	http://news.tf.co.kr
Year	2017						
Season	S/S			Season	F/W		
Name	Ko So-young	Kim Eun-seo	Lee Hye-sook	Name	Lim Sang-mi	Yoon Da-young	Han Seung-yeon
TV drama	Ms. perfect	That woman's sea	Bokdanji is back	TV drama	Save me	Blossom dalsoon	Hello, my twenties! 2

Noble line				Mode line			
Site address	https://m.edaily.co.kr	https://www.topstarnews.net	https://www.mbn.co.kr	Site address	https://www.hankyung.com	http://www.kyeonggi.com	https://search.naver.com
Year	2018						
Season	S/S			Season	F/W		
Name	Park Min-young	Lee Sung-kyung	Kim So-hyun	Name	Chae Soo-bin	Kim Yoo-jung	Baek Jin-hee
TV drama	What's wrong with secretary Kim	About time	Radio romance	TV drama	Where stars land	Lean with passion for now	Feel good to die
French sepia ash				French mauve ash			
Site address	http://www.sisafocus.co.kr	https://blog.naver.com	https://blog.naver.com	Site address	https://blog.naver.com	https://blog.naver.com	https://blog.naver.com
Year	2019						
Season	S/S			Season	F/W		
Name	Lee Ji-eun	Seo Hyun-jin	Song Hye-kyo	Name	Son Ye-jin	Im Soo-jung	Gong Hyo-jin
TV drama	Hotel delLuna	Black dog	Boyfriend	TV drama	Crash landing on You	Please enter a search term	When the camellia blooms
Foggy line				Neo vintage line			
Site address	https://blog.naver.com	https://blog.naver.com	https://blog.naver.com	Site address	https://blog.naver.com	https://blog.naver.com	https://blog.naver.com

5. Conclusion

This study is based on the analysis of celebrity hair color trends in Milbon collection by collecting related data through prior research papers and internet data published by domestic and foreign hair brands from 2016 to 2019. In 2016, the S/S Lumiere colors of the celebrities appeared in the TV dramas created a natural atmosphere, while the F/W Healthy colors expressed the unique softness of the cold color. The S/S Noble colors of the celebrities in the 2017 TV dramas produced softness and gloss as if it were mixed with cream, while the F/W Mode colors expressed both a soft texture and a cold color. In 2018, the celebrity's S/S French Sepia Ash colors produced an elegantly casual atmosphere, while the F/W French Mauve Ash colors expressed a perfectly beautiful quality as well as a casualness of a

light cold color. In 2019, the S/S Foggy colors in the TV dramas produced smooth greige, while the F/W Neo Vintage colors expressed deep greige with depth and softness.

The hair colors of celebrities who appeared in TV dramas expressed the concept, texture, images, and feelings that come from hair colors in the Milbon color trend. These results of hair color trend analysis are based on the comparison and analysis from the subjective point of view of the researcher, and there are limitations in securing universality, and it is expected that follow-up research on hair color trends will be conducted in the future.

By understanding the current Milbon color trends and hair trends year by year, this study aims to provide basic data on hair color collection analysis by hair dye brands as well as provide a foundation for predicting and utilizing future trends.

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7. Appendix

7.1. Authors contribution

	Initial name	Contribution
Lead Author	JH	-Set of concepts ☑ -Design ☑ -Getting results ☑ -Analysis ☑ -Make a significant contribution to collection ☑ -Final approval of the paper ☑ -Corresponding ☑ -Play a decisive role in modification ☑
Corresponding Author*	MC	
Co-Author	JK	-Significant contributions to concepts, designs, practices, analysis and interpretation of data ☑ -Participants in Drafting and Revising Papers ☑ -Someone who can explain all aspects of the paper ☑

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Corresponding author*
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The Study on Relationship between Satisfaction with FLEXIBLE-WORK Arrangement, Job Satisfaction and Decision Making

Yongjin Sa

Keimyung University, Daegu, Republic of Korea

Abstract

Purpose: *The primary purpose of this study is to quantitatively analyze the relationship between civil servants' satisfaction with flexible-work arrangement and their job satisfaction. In addition, another goal of this study is to verify the moderating effect of decision-making on the relationship between satisfaction with flexible-work system and job satisfaction. By doing so, this study is highly anticipated not only to contribute to the development of Korea's quantitative research on flexible-work system, but also to provide implications for enhancing the effects of flexible-work arrangement from a practical point of view.*

Method: *To verify the hypotheses of this study, the 2020 Public Employee Perception Survey data provided by the Korea Institute of Public Administration(KIPA) was used. The subjects of this survey are public officials from the central administrative agencies and metropolitan local governments. Variables included in the analysis model of this study include job satisfaction(dependent variable), satisfaction with flexible-work arrangement(independent variable), decision-making(control variable), gender, age, marital status, educational background, and position(control variable). Statistical analysis was performed to verify the moderating effect by validating the hypotheses through regression analysis.*

Results: *As a result of the statistical analysis, civil servants with a higher level of satisfaction with their flexible-work arrangement were found to have a higher job satisfaction than their counterpart. Moreover, hypothesis testing on the moderating effect of decision-making on the relationship between satisfaction with flexible-work arrangement and job satisfaction verified a partial moderating effect of decision-making. In addition, older civil servants and married civil servants tend to have higher job satisfaction than each of their corresponding counterparts.*

Conclusion: *In order to overcome the limitations of quantitative studies conducted on flexible-work arrangement in Korea, this study analyzed the quantitative relationship between satisfaction with flexible-work system and job satisfaction and confirmed a positive relationship between the two variables. In addition, the moderating effect of decision-making on the positive influential relationship between satisfaction with flexible-work arrangement and job satisfaction were verified. It suggests that in order to further strengthen the positive relationship between satisfaction with flexible-work system and job satisfaction, efforts need to be made to enhance the fairness and transparency of decision-making process within organizations.*

[Keywords] ***Flexible-Work Arrangement, Satisfaction with Flexible-Work Arrangement, Job Satisfaction, Decision Making , Public Sector***

1. Introduction

Flexible work arrangement or system allows employees to choose a work method, schedule, and location different from the traditional working condition to meet their needs and preferences when working. The key purpose of flexible-work system, as a family-friendly policy that

aims to balance work and family, is to alleviate work-family conflicts while enhancing personal life satisfaction by granting workers discretion over their working method.

In general, previous studies on the effects of flexible-work arrangement showed that active and correct implementation of flexible-work system has a positive effect on various organizational outcome variables(e.g. job satisfaction, organizational productivity, organizational commitment, turnover intention, etc.). Nonetheless, the extent of the effects of flexible-work system is somewhat different depending on the characteristics of an institution or a job, disposition of individual worker, and work environment.

Since August 2010, the central and local governments of Korea have fully implemented flexible-work arrangement with gradually increasing number of utilizations.

A total of seven types of flexible-work arrangements have been implemented for civil workers in Korea depending on workhour, workload, and workplace flexibility[1][2]. A brief summary of the seven types of flexible-work system concepts is shown in <Table 1>.

Table 1. Type of flexible-work arrangement.

	Type	Concept
Work type	Part-time work	Working less than 40 hours per week
Workhour	Flex-time work	Working 8 hours a day, adjusting/varying working hours by the employees
	Alternative work schedule	Working 5 days a week while adjusting daily working hours from 4 to 12
	Compressed work	Working 3.5 ~ 4 days a week while adjusting daily working hours from 10 to 12
	Discretionary work	Working for a project instead of working 40 hours/week without the obligation to going into the office or work
Workplace	Work-at-home	Performing assigned tasks at home instead of going into the office
	Smart work	Working at a separate office, such as a smart work center, near home

Note: Source: the ministry of personnel management website.

Regardless of the increase in the use of flexible-work system in the public sector, the number of studies examining flexible-work system is insignificant. In particular, quantitative research on the effects of flexible-work arrangement for civil servants has not been actively conducted. The difficulty in conducting quantitative research due to a lack of systematical and regular perception survey on flexible-work system among public employees and corresponding data management can be considered as one of the main reasons of such deficiency. As such, the core purpose of this study is to overcome such limitations of previous studies on flexible-work arrangement of the public sector and to contribute to the development of quantitative research on flexible-work system. More specifically, this study aims to verify the relationship between satisfaction with the utilization of flexible-work arrangement and job satisfaction in the public sector as well as the moderating effect of decision-making on their relationship.

2. Literature Review

2.1. Relationship between satisfaction with flexible-work arrangement, job satisfaction and decision making

A recent study derived and suggested the subjects of follow-up studies on flexible-work system by analyzing the research trends and contents found in academic papers directly dealing with flexible-work system in the public sector of Korea[3]. The study divided domestic trends of researching flexible-work system into three categories of research on the effects of flexible-

work arrangement[4][5][6][7][8], research on the factors affecting the selection of flexible-work arrangement[2][9][10][11][12], and research that analyzes the status of flexible-work system in order to derive improvement measures[13][14][15][16] while suggesting the relationship between satisfaction with flexible-work system and job satisfaction as one of the subjects of follow-up studies on flexible-work system in Korea. Therefore, this study intends to perform a quantitative analysis on the relationship between satisfaction with flexible-work arrangement and job satisfaction.

The word 'satisfaction' can be defined as the degree of agreement between a selected alternative and the expectation in the alternative when selecting[17]. For instance, satisfaction, when purchasing a product, can be explained as the ratio between the cost invested by the buyer to purchase the product and the compensation received through the purchase. Research on job satisfaction has been actively conducted in both the public and private sectors. Analyzing the factors affecting job satisfaction among police officers[18] and examining the exercise commitment, performance, and satisfaction in Taekwondo teams[19] are two examples. In general, previous studies that quantitatively analyzed the relationship between the use of flexible-work arrangement and job satisfaction in the public sector showed a statistically significant positive relationship between the two. For example, some of the previous studies examined the effects of participation in and satisfaction with flexible-work system(flex-time work and work-at-home) on job satisfaction and turnover intention[5], relationship between the use of different time commuting and smart work system and job satisfaction[7], and relationships among married women's work/family conflict, work/family facilitation, flexible work system, and job satisfaction[8].

In addition, a study suggested that communication or decision-making within an organization has a positive effect on both intrinsic and extrinsic satisfaction of workers[20], implying that variables such as the level of participation in decision-making among organizational members, especially low-ranking workers, and the fairness of the decision-making process, affect workers' job satisfaction. Disapproval by superiors, social cues, and negative perception of the organization about the use of flexible-work system are some of the reasons why employees are not able to use flexible-work arrangement more actively. It can be interpreted that the difference in the use of or satisfaction with flexible-work system among workers is not only related to the flexible working system of an organization, but also the fairness of communication and decision-making within the organization.

The primary purpose of this study is to quantitatively analyze the relationship between civil servants' satisfaction with flexible-work arrangement and their job satisfaction. In addition, this study sought to verify the moderating effect of decision-making on the relationship between satisfaction with flexible-work system and job satisfaction in order to contribute to the development of quantitative research on flexible-work system. Consequently, the following hypotheses are established for the study.

H1: Satisfaction with flexible-work arrangement will have a significant positive(+) effect on job satisfaction.

H2: Decision-making will significantly moderate the positive(+) relationship between satisfaction with flexible-work arrangement and job satisfaction.

3. Research Methodology and Statistical Results

3.1. Data source and measures of variables

To verify the hypotheses of this study, the 2020 Public Employee Perception data surveyed and provided by the Korea Institute of Public Administration(KIPA) was used[1]. The data

[1] This study makes use of research material produced by the Korea Institute of Public Administration(KIPA), and

constructs a part of the annual perception survey of public employees of the central and regional administrative agencies regarding the government's manpower management and organizational operation.

The question items used to measure the variables included in the analysis model of this study are as follows.

First, the item of 'I am satisfied with my work regardless of compensation' was used for the dependent variable of job satisfaction. Similarly, the items of 'satisfaction with using flexible work system' and 'decision-making process at my institution is fair and transparent' were used respectively for the independent variable of satisfaction with flexible-work arrangement and the moderating variable of decision-making. All items were measured based on a five-point Likert scale with the following measurements of the control variables: gender(Male - 1; Female - 2), age(20s - 1; 30s - 2; 40s - 3; 50s or older - 4), marital status(Married - 1; Single - 2), educational background(High school graduate or less - 1; College graduate - 2; Bachelor's degree - 3; Master's degree - 4; Doctoral degree - 5), position(Grade 1 - 1; Grade 2 - 2; Grade 3 - 3; Grade 4 - 4; Grade 5 - 5; Grade 6 - 6; Grade 7 - 7 ; Grade 8 - 8; Grade 9 - 9).

3.2. Hypotheses test

<Table 2> shows the results of basic statistical analysis(average, standard deviation) of the variables included in the analysis model of this study. The total sample size of the 2020 Public Employee Perception Survey was 4,339, but the number of civil servants who responded to satisfaction with flexible-work arrangement, which is an independent variable of this study, was 3,146. Therefore, the actual sample size analyzed in this study is 3,146.

The results of correlation analysis between variables are as shown in <Table 3>. The correlation between satisfaction with flexible-work system and job satisfaction, decision-making and job satisfaction, and decision-making and satisfaction with flexible-work system was found to be .190, .360, and .190, respectively.

Table 2. Descriptive statistics.

Variable	N	M	SD
Job satisfaction	4339	3.283	.905
Satisfaction with flexible-work arrangement	3146	3.825	.908
Decision making	4339	3.157	.838
Sex	4339	1.433	.496
Age	4339	2.786	.894
Marital status	4339	1.307	.461
Education level	4339	3.060	.669
Grade	4339	6.257	1.178

has been authorized for use according to KIPA's regulations on the ownership and use of said research material.

Table 3. Correlations.

Variable	1	2	3	4	5	6	7	8
1. Job satisfaction								
2. Satisfaction with flexible-work arrangement	.190							
3. Decision making	.360	.236						
4. Sex	-.088	-.015	-.130					
5. Age	.276	.017	.071	-.165				
6. Marital status	-.202	-.033	-.075	.188	-.505			
7. Education Level	.043	.002	-.040	-.047	.110	-.082		
8. Grade	-.153	-.019	-.047	.169	-.503	.347	-.292	

<Table 4> shows the result of regression analysis conducted to verify a positive effect of satisfaction with flexible-work arrangement on job satisfaction as stated in the H1 of this study. As shown in <Table 4>, a statistically significant positive(+) relationship between satisfaction with flexible-work arrangement and job satisfaction was observed(β=.185, p=.000),providing a ground to adopt the first hypothesis of this study. Examining the relationship between the control and dependent variables reveals that older civil servants and married civil servants tend to have higher job satisfaction than each of their corresponding counterparts.

Table 4. Results of regression on the effect of satisfaction with flexible-work arrangement on job satisfaction.

Job satisfaction (dependent variable)	Coefficient	Standard errors	t-value	p
Satisfaction with flexible-work arrangement	.185	.017	10.93	.000***
Gender	-.062	.032	-1.95	.051
Age	.234	.022	10.76	.000***
Marital status	-.144	.039	-3.69	.000***
Education level	.014	.024	.56	.574
Position	-.001	.016	-.01	.994
Constant	2.169	.196	11.09	.000***
R^2=.116, F=68.81, p=.000				

Note: *p<.05, **p<.01,***p<.001.

<Table 5> shows the results of analysis conducted to verify the moderating effect of decision-making on the relationship between satisfaction with flexible-work arrangement and job satisfaction, which is the second hypothesis of this study. The independent variable of satisfaction with flexible-work system, the moderating variable of decision-making, and the interaction term(flexible work system satisfaction*decision-making) between the independent variable and the moderating variable were sequentially included in the analysis model for regression analysis. In order for a variable to have a significant moderating effect, the following three conditions

must be satisfied[21][22]. First, the change in the significance probability, F, should be statistically significant for all of the Model 1(independent variable and dependent variable), Model 2(independent variable, moderating variable, and dependent variable), and Model 3(independent variable, moderating variable, independent variable * moderating variable, and dependent variable). Second, the R^2 value of Model 1, Model 2, and Model 3 should increase sequentially. Third, the regression coefficient of the interaction term between the independent variable and the control variable should be statistically significant. As shown in <Table 5>, the changes in the significance probability of Model 1, Model 2, and Model 3 were all statistically significant. In addition, although the R^2 value for each model is not too high, it increased sequentially(Model 1 = .116; Model 2 = .207; Model 3 = .208). However, the regression analysis on Model 3 showed that the regression coefficient of the interaction term(satisfaction with flexible-work system * decision-making) is not statistically significant. That is, this study verified a partial moderating effect of decision-making on the relationship between satisfaction with flexible-work system and job satisfaction.

Table 5. Results of regression on the moderating effect of decision making on job satisfaction.

	Job satisfaction (dependent variable)	F	R^2	p
Model 1	Satisfaction with flexible-work arrangement	68.81	.116	.000
Model 2	Satisfaction with flexible-work arrangement decision making	117.60	.207	.000
Model 3	Satisfaction with flexible-work arrangement decision making Satisfaction with flexible-work arrangement*decision making	15.90	.208	.000

4. Discussion

This study quantitatively analyzed the effect of satisfaction with flexible-work arrangement on job satisfaction of public officials. Furthermore, the moderating effect of decision-making on the relationship between satisfaction with flexible-work arrangement and job satisfaction was verified. The key observations made through the statistical analysis of this study are as follows. First, it was found that those civil servants who perceive the level of satisfaction with flexible-work system high tend to have higher the job satisfaction. Second, the decision-making variable was found to have a partial effect on regulating the positive relationship between satisfaction with flexible-work arrangement and job satisfaction. It suggests that in order to further strengthen the positive relationship between satisfaction with flexible-work system and job satisfaction, efforts need to be made to enhance the fairness and transparency of decision-making process within organizations. In addition, it signifies the needs of establishing a more fair and transparent system and organizational culture for making decisions related to the promotion and approval of the use of flexible-work system. Most of the previous studies on flexible work-arrangement focused on analyzing the quantitative relationship between the use of flexible-work system and organizational outcome variables(job satisfaction, performance, organizational commitment, turnover intention, etc.). In other words, there existed a gap in research on the relationship between satisfaction with flexible-work system and organizational outcome variables. As such, this study is highly anticipated not only to contribute to the development of Korea's quantitative research on flexible-work system, but also to provide implications for enhancing the effects of flexible-work arrangement from a practical point of view.

In spite of the theoretical and practical contributions that this study is anticipated to make, this study has the following limitations. First, all of the dependent, independent, and moderating variables used in the analysis model of this study are based on the subjective responses made by public officials who participated in the perception survey. In other words, interpreting the analysis results is limited as the statistical analysis was conducted without the use of objective measurement. Second, this study has another limitation in that it used single-year survey data, rather than panel or multi-year data, when performing statistical analysis. Conducting quantitative analyses on flexible-work system using multi-year data obtained by surveying public officials in follow-up studies is expected to help provide clear interpretations of the causal relationship between variables.

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6. Appendix

6.1. Authors contribution

	Initial name	Contribution
Author	YS	-Set of concepts ☑ -Design ☑ -Getting results ☑ -Analysis ☑ -Make a significant contribution to collection ☑ -Final approval of the paper ☑ -Corresponding ☑ -Play a decisive role in modification ☑ -Significant contributions to concepts, designs, practices, analysis and interpretation of data ☑ -Participants in Drafting and Revising Papers ☑ -Someone who can explain all aspects of the paper ☑

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A Comparative Analysis of the Women Characters' Characteristics of "Aladdin" of Disney's ANIMATION and Live Action Film

Seohyun Song

Osan University, Osan, Republic of Korea

Abstract

Purpose: *In this study, how the identity of women characters in Disney's animation of "Aladdin" was changed among the live action film characters, and how they were visually reflected were analyzed, and the value with providing help for the new contents development for the production of live action films.*

Method: *Princess Jasmine, Aladdin's woman character, was selected as the research subject, and the scenes overlapping with the original animation were extracted from the live action film scenes, after which the characters, makeup, hairstyle, apparel styling, and apparel colors were compared and analyzed. As for the color analysis, it was performed by using the Korean Standard Color's Color Analysis(KSCA) program.*

Results: *Princess Jasmine's character orientation was completed with a new character who sought to become the Sultan of Agrabah by breaking away from a passive and male dependent woman. In the live action film, the eye shadow and lip color were changed to produce the angular eyebrows and clear eyes, while the hairstyle was changed to colorful accessories, braided hair, parting position, and upstyle, respectively. In the anime, blue is the primary color for apparel on the exposed tops and pants, and depending on the situation, a sexy image was created with the color of red. In the live action film, it was a formal dress and pants, while purple, gold, orange, and green were primarily used since the signature colors is blue green.*

Conclusion: *The identity of Princess Jasmine's woman character has transformed from femininity to an entrepreneurial leader, and it is expected that the character analysis and research will continue to develop creative and original films when producing the live action films which recreate animation characters.*

[Keywords] ***Women Characters, Disney's Animation, Aladdin, Live Action Film, Characteristics***

1. Introduction

Given the development of science and technology, various human needs have been satisfied across the fields of industry, economy, society, academia, and art[1], and as a popular cultural content, Disney's animation has become a worldwide animation through the Disney-styled transformation which borrows various materials[2][3]. In the animation, characters during the play have the characteristics which enable visual recognition and emotional transfer as animated characters such as the actors in movies or dramas according to their roles in developing their stories[4].

The production of Disney's animation's live action film begins with "Alice in Wonderland(2010)" and remakes of the original were made, and each and every time the movie is released, the story changes, and the entertaining characteristics are further strengthened, and an interesting image is produced, along with which large and small personality changes of the main characters have attracted attention[5][6]. Disney has made live action films because the probability of failure is low as it has solved the problems of quality of the stories and the fun of

* Manuscript for the academic conference presentation.

existing works, and has also already confirmed the reaction of the consumers[7].

"Aladdin" is among the four major blockbuster films which signalled the magnificent revival of the Disney Studios in the early 1990s, including "The Little Mermaid," "Beauty and the Beast," and "Lion King," and is also a work which borrowed multiple elements to portray in the Disney style from "Aladdin and the Magic Lamp" and "Alibaba and the Forty Thieves"[8].

The recent increase in the animation works focused on women characters reflects such social trends as changes in the women's roles and the perception of femininity and the consumer demand for the new expression of feminity image[9]. The critiques claimed that the live action film of Disney's animation of "Aladdin," which was released in 1992, such as various castings who were differentiated from the original animation and a new direction of "Aladdin", namely Princess Jasmine's character change[10].

Accordingly, the previous studies related to Disney were conducted from various angles, and primarily those related to the types of character personality[11][12], character apparel and color images[13][14][15], music style[16][17], etc., were the majority. However, those comparing the original and live action films are yet minimal at best. Trends are not merely imitated, but are quickly seen in the beauty and fashion industries as a means of expressing individuality[18], and are also utilized for design development across various fields of culture[19][20]. In the live action films, the woman protagonist has been changed by reflecting the changes in the image and ideology required by the current era, and it is believed to be worth public studies to examine and understand the characters' characteristics which may underscore the stories relative to the classic animations.

In this study, how the identity of women characters appearing in Disney's animation of "Aladdin" changed from the live action film characters, and how they were visually reflected, as well as how it provide help for developing new contents for the production of live action films which revive the characters by analyzing makeup, hairstyle, apparel styling, and apparel colors.

2. Research Method

As for the research subject, Princess Jasmine, a woman character of "Aladdin," who represents the character changes of the Disney's animation, was selected. As for the research method, after extracting the scenes overlapping with the original animations from among the movie scenes[21], the characters, makeup, hairstyle, apparel styling, and the colors were compared and analyzed accordingly.

As for the color analysis, the Korean Standard Color Analysis(KSCA) program provided by the Korean Agency for Technology and Standards was used to capture the apparel of Princess Jasmine in the animation and live action film, after which removed the background, then made corrections for the brightness and contrast with Photoshop[22], following which it was analyzed in line with the Korean Industrial Standards(KS A 0062).

3. Research Results

3.1. Analysis of characters

Disney's animation has expressed women characters which have changed according to the times and social trends through the works represented by "Disney Princess." In the early phase, women characters were expressed to be beautiful and passive women with the help of facilitators, and from the mid phase(1980s to 1990s), the changes emerged with the characters which emphasized a cheerful and active image rather than the feminine beauty, and during the latter half(since the 2000s), they have transformed into an object which expresses one's intentions even more progressively and independently and searches the self[23][24].

In order to compare and analyze Princess Jasmine's character, the 5 overlapping scenes from the stories of the original animation and the live action film were extracted and compared as follows <Table 1>.

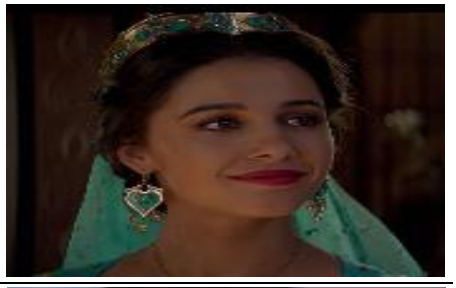
Table 1. Comparison of characters.

Story	Image of scene	
	Animation	Live action film
1. Deviation from Kingdom		
2. First encounter with Aladdin		
3. Tour on the magic carpet		
4. Showdown with Jafar		
5. Marriage with Aladdin		

3.2. Analysis of make up

In order to compare and analyze Princess Jasmine's makeup, the 5 overlapping scenes from the original animation and the story of the live action film were extracted and compared as follows <Table 2>.

Table 2. Comparison of makeup.

Story	Image of scene	
	Animation	Live action film
1. Deviation from Kingdom		
2. Meeting with the suitor(prince Anders)		
3. Meeting with the suitor (prince Ali)		
4. Tour on the magic carpet		
5. Showdown with Jafar		

In the animation, the makeup was expressed in a feminine and sexy image with dark skin expression, with arched eyebrows, cat eyeliner with raised eyebrows, and red lip along with the dark skin expression, and rather than changing make up for each situation, expression was produced according to various emotions.

1. In the deviation from the royal palace, the animation portrays a feminine and sexy image with the dark skin expression, arched eyebrows, cat eyeliner with raised eyebrows, and red lip, whereas in the live action film, natural makeup was portrayed with the dark skin expression, angular eyebrows, brown eye shadow, clear eye line and the beige lip color.

2. In the meeting with the suitor, there was no change in the makeup in the animation, whereas in the live action film, dark skin expression, angular eyebrows, pearl brown eye shadow, eyeliner, and pink beige lip color gave a bright look.

3. In the scene where Aladdin meets Prince Ali under disguise, and in the live action film, the makeup was changed to match the orange colored dress with the orange and brown eyeshadow and lip colors.

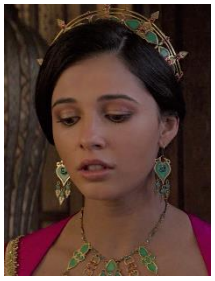
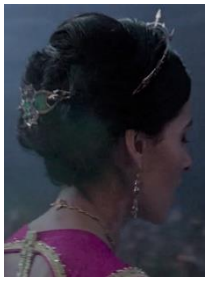
4. In the tour with Aladdin on the magic carpet, the live action film produced the most spectacular and feminine makeup with the dark skin expression, angular eyebrows, shimmery gold brown eyeshadow, eyeliner, and the red lip color.

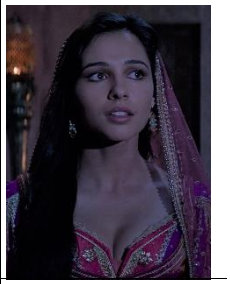
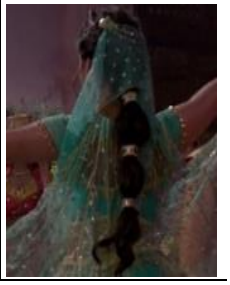
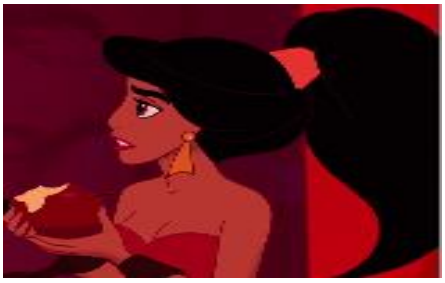
5. In the showdown with Jafar, the animation stressed a more sexy image with the red skin expression and the raised cat eyeliner, whereas in the live action film, dark skin expression, angled eyebrows, pearl brown eyeshadow, eyeliner, and pink beige lip color were identical to the everyday makeup expression in the palace.

3.3. Analysis of hair style

In order to compare and analyze Princess Jasmine's hairstyle, the 5 overlapping scenes from the story of the original animation and live action film were extracted and compared as follows <Table 3>.

Table 3. Comparison of hairstyle.

Story	Image of scene		
	Animation	Live action film	
1. Deviation from Kingdom			
2. Meeting with the suitor (prince Anders)			

3. Meeting with the suitor (prince Ali)				
4. Tour on the magic carpet				
5. Showdown with Jafar				

1. In the scene of the Princess wandering in the market, the animation was directed in a ponytail style under a veil, whereas in the live action film, it was directed with a braided hair in the middle and a veil.

2. In the scene where the Princess meets the suitor in the court, the animation is decorated with a ribbon in a rich ponytail style, whereas in the live action film, the upstyle of the side parting was used to create a dignified and elegant feeling like a queen.

3. In the meeting with Aladdin, in the animation, there is no change in the hairstyle, whereas in the scene of meeting Prince Ali in the live action film, a long hair with a half-tied hair ornament in the middle parting was produced, and in the scene where the Princess is waiting after meeting with Aladdin, a wealth of hair was swept towards one side and hung down, thereby stressing on the femininity.

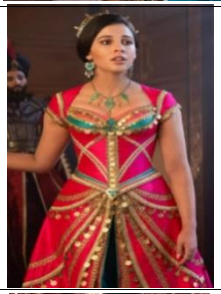
4. In the scene where the Princess and Aladdin together ride on the magic carpet, the animation changes her hairstyle as Aladdin puts flowers in Princess Jasmine's hair. In the live action film, however, a neat image like a princess was created with an animation like hairstyle with a ribbon decoration on the ponytail of a 50:50 parting.

5. In the showdown with Jafar, the animation was produced with a sexy image with a richer ponytail, whereas in the live action film, it was produced with a feminine and elegant feeling with a half-tied hairstyle while wearing a 50:50 parting.

3.4. Analysis of the apparel styling

In order to compare and analyze the Princess Jasmine's apparel styling, the 5 overlapping scenes from the story of the original animation and live action film were extracted and compared as follows <Table 4>.

Table 4. Comparison of apparel styling.

Story	Image of scene	
	Animation	Live action film
1. Deviation from Kingdom		
2. Meeting with the suitor		
3. Harvest Banquet		
4. Showdown with Jafar		
5. Marriage with Aladdin		

1. In the scene of the Princess wandering in the market during the deviation from the Kingdom, both the animation and live action films were directed with a veil, and the body and face were concealed through the abaya and veil customarily worn in the Arab culture[25].

2. When the Princess was meeting the suitor, the animation wore an off-shoulder top and harem pants which exposed her shoulders and belly button, and there was no change in her apparel. In the live action film, however, the first apparel was a magenta short-sleeved top with

gold decorations hanging down like charms, and the second apparel was a bright orange color of a long-sleeved top with green points and emerald accessories.

3. The Harvest Banquet is a scene added in the live action film and could not be seen in the animation, and the apparel worn is made with a peacock motif, a metaphor for a bird-like existence which desires a free spirit but is confined to the royal family [26].

4. In the showdown with Jafar, in the animation, the Princess portrayed a more sexy image to seduce Jafar with bracelets and handcuffs, etc., while wearing harem pants and a top which showed off her shoulders. Whereas, in the live action film, the design was made to portray the pants not inside the dress, but rather expose them by design, with the accessories much more simplified.

5. In the Princess' marriage to Aladdin, the animation portrayed a long-sleeved top, harem pants, and a see-through shawl, whereas in the live action film, it was directed with a short-sleeved top and a dress.

3.5. Comparison of apparel colors

In order to compare and analyze the Princess Jasmine's apparel colors, the 5 overlapping scenes from the story of the original animation and live action film were extracted and compared as follows <Table 5>.

Table 5. Comparison of apparel colors.

Story	Image of scene					
	Animation			Live action film		
1. Deviation from Kingdom			8.75R 6/8 1.25YR 4/8 7.5BG 7/2			6.25YR 8/2 6.25YR 6/8 7.5BG 6/4
2. Meeting with the suitor (prince Anders)			3.75B 7/6 3.75PB 5/6 8.75B 8/4 5YR 7/10			5RP 5/14 6.25YR 7/6 8.75BG 6/6 5G 5/6
3. Meeting with the suitor (prince Ali)						8.75YR 9/2 6.25YR 7/8 7.5GY 5/4 10G 7/6

4. Harvest Banquet						5BG 6/6 3.75YR 6/6 6.25G 5/4 8.75B 4/6
5. Showdown with Jafar			7.5R 3/12 6.25R 5/14 10R 5/12			2.5RP 3/10 3.75R 7/4 5YR 7/4

1. In the deviation from the Kingdom, the animation portrayed dark and calm in brown with a reddish tinge of red and orange. The live action film, however, portrayed a natural and friendly feeling by changing the tone of the same color of orange.

2. When the Princess was meeting the suitor, in the animation, indigo and orange were used as the main colors for the animation, and the mint color, which is cyan, as the main color, while portraying a feminine and clear image[27]. Whereas, when the Princess was meeting the suitor, Prince Anders, the live action film portrayed a feminine and soft image with purple and turquoise colors matching points and gold and green colors.

3. When the Princess met the suitor, Prince Ali, the live action film portrayed orange, gold, and yellow green colors, portraying a sociable feeling. When the Princess is demanded to be feminine, it is the main color, but by using the secondary color turquoise, it portrays the character of a leader who does not give in and continues to be cool[28].

4. At the Harvest Banquet, the live action film portrays peacock motif colors turquoise, gold, green, and blue, and turquoise is Princess Jasmine's signature color, and is applied across all apparel and accessories.

5. In the showdown with Jafar, the animation portrays a sexy image in red, which means passion and anger. Whereas, the live action film expressed the status of royalty with purple and gold, etc., and evidently expressed a strong personality and one's intention to marry with intense colors with high saturation.

4. Conclusion and Discussion

In this study, how the identity of women characters making their appearance in Disney's animation of “Aladdin” changed in the live action film characters, and how they were visually reflected were studied by analyzing the characteristics of the characters, whose results are as follows.

First, the Princess Jasmine's character orientation was not intended to run away from an undesired marriage, but rather become the wise Sultan of Agrabah herself, and a new character with her progressive leadership has been completed by breaking away from the passive and the male dependent woman.

Second, the makeup in the animation stressed on an obedient and gentle image[29] and a sexy image with arched eyebrows, raised eyes and red lip, whereas the live action film expressed a confident and intelligent image with angled eyebrows. Furthermore, there was a difference between the day and night makeups with clear eyebrows, colorful pearl eye shadow, and black

eye makeup which draws even the underline for the eyes. Whenever there was a scene of deviation from the royal palace or an official event of meeting a suitor, the Princess changed from a natural brown makeup to a gorgeous red lip makeup for the evening banquet.

Third, the hairstyle was decorated with colorful ornaments in both the animation and live action film, and in the live action film, braided hair and parting positions were changed to portray a feminine and elegant image.

Fourth, in the apparel styling, the animation portrays the Princess wearing highly exposed tops and harem pants, and the changes in apparel were minimal at best. Whereas, in the live action film, wearing pants under a dress with low exposure stressed on the activeness and reflected the character's personality changes and expressed such in the apparel.

Fifth, in the apparel colors, the main apparel of the animation portrayed a sexy image with blue, orange, indigo, or red, which means passion and anger in the showdown with Jafar. Whereas, in the live action film, turquoise with a peacock motif was applied to all apparel, and vivid tones of purple, gold, orange, and green were mainly used to portray royal status, passion, and strong character, etc.

Aladdin's changes in the character towards Princess Jasmine and the reinterpretation thereof, in tandem with an ambience which respects women and diversity, received a great response from the public, thereby demonstrating the fact that gender perception and stereotypes of gender roles have changed[30]. The identity of the Princess Jasmine's woman character has changed from femininity to an entrepreneurial woman leader, and it is also expected that the character analysis and research will continue and develop creative and original films when producing live action films which revive the animated characters.

As a limitation of the study, there was a difference in the results of color analysis even with the same colors when compared with the previous papers, which is thought to be caused by the differences between the apparel captured photos and the condition of screen corrections.

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6. Appendix

6.1. Authors contribution

	Initial name	Contribution
Lead Author	SS	-Set of concepts ☑ -Design ☑ -Getting results ☑ -Analysis ☑ -Make a significant contribution to collection ☑ -Final approval of the paper ☑ -Corresponding ☑ -Play a decisive role in modification ☑ -Significant contributions to concepts, designs, practices, analysis and interpretation of data ☑ -Participants in Drafting and Revising Papers ☑ -Someone who can explain all aspects of the paper ☑

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A Study on Development of Interactive Communication Education Model for Creative Convergence in PUBLIC VALUE

Youngdon Kang

Dongyang University, Yeongju, Republic of Korea

Abstract

Purpose: *As the times are changing rapidly, the change in the educational paradigm of universities is in an environment where it is impossible to retreat any more. Global leaders and future companies are demanding talents with collaboration, communication, and creativity. The most important educational system for nurturing talents with these competencies in universities requires a change in educational method from one-way education to interactive education. This paper is to propose the development of a communication education model to meet the creative convergence-type talent cultivation desired by the future society in the age of artificial intelligence.*

Method: *The true meaning of interactive education is to increase the participation rate of learners in class and to increase self-directed learning ability and creativity through self-learning. Moreover, creativity development comes from the process of self-learning with interest. As distance classes increase due to COVID-19, the realization of interactive communication education is emerging as a biggest problem. There is a way to support the implementation of sufficient learning in online and offline education by using smart tools instead of test papers. This paper is to focus on using the interactive communication tools such as QuizN, Symflow, and Padlet.*

Results: *In order to enhance the creativity of learners at universities, which are higher education institutions, efforts such as the development of various programs, the production of various contents, and the design and development of teaching and learning methods should be made. In addition, the following conditions are required for the educational method in universities for creativity enhancement. First, the learner's interest, motivation, and voluntary participation in class must be preceded. Second, it is necessary to enhance the humanities thinking ability, which has the characteristic of multiplicity. Third, the learner must lead the class proactively.*

Conclusion: *This study proposed the development of the interactive education model for creative convergence talents. Based on the results of this study, it is expected that it will greatly contribute to the development of education such as program development, content production, and teaching-learning method development for value creation of an academic education model. Moreover, given the reality of conducting online distance education due to COVID-19, it is expected that the interactive communication education model proposed in this study can be fully utilized.*

[Keywords] ***COVID-19, Interactive Education, Education Model, Non-Face-To-Face Training, Self-Directed Learning***

1. Introduction

As all industrial fields are continuously changing rapidly, the era of artificial intelligence has arrived, where technologies from different fields are fused together, and big data exerts its power beyond the digital era led by communication and automation systems centering on computers and the Internet. Moreover, it is now the era of the metaverse centered on augmented reality and the virtual world. As Klaus Schwab, president of the World Economic Forum, who heralded innovative changes across all industries, said at the 2017 World Global Talent Forum,

“Global leaders in the world have problem-solving skills with the foundation of imaginative creativity as talented people who will lead the future. He emphasized the importance of creative convergence talents with solving skills”[1]. Moreover, future-leading companies that need to constantly develop new technologies have selected personality as the most important virtue, and they are looking for a talent with collaboration, communication, and creativity skills. In other words, it can be said that creative and convergence talents who can interpret and utilize existing ones anew on the basis of personality, and who have comprehensive convergent thinking ability, are suitable for the future era.

Therefore, in the future society, it is clear that the requirements for the future talents claimed by the global talent forum and future companies will be accelerated. What global leaders and future companies have in common is that they are all demanding talented people with creativity[2]. Creativity is the ability to devise and create useful things while clearly differentiating them from existing ones. However, the university, which is a higher education institution that researches and develops science and nurtures high-quality talent, emphasizes the importance of in-depth study, but on the other hand, research and development or efforts on a learner-centered education system are not adequately suited to the trend of the times. Although some universities are trying to overcome the problems of the existing traditional education system and change a new education model, it is clear that there is a limit to derive the effect of education immediately because it is placed in a very difficult environment for creative development.

As the flow of time is rapidly changing, the change in the educational paradigm of universities is also in an environment in which it is impossible to retreat any longer. Global leaders and future companies are demanding talented people with collaboration skills, communication skills, and creativity. The most important educational paradigm for nurturing talents with these competencies in universities is to change the educational method from one-way communication education to two-way communication education. In other words, the need to develop an interactive education system so that learners who will be at the center of the future can become the subject of the class rather than the object of the class is emerging. However, in reality, the establishment of a system for interactive communication education is remarkably insufficient. Many experts and scholars in university emphasize that research and efforts should be made continuously so that the forum for interactive communication can be actively formed to enhance competencies such as creativity and collaboration skills[3][4][5]. Various methods can be devised to solve this problem, but the most important thing to consider is that learners need to develop communication tools that can spark interest in the class[6][7][8].

No matter how high-quality teaching methods are adopted, if the learner's participation rate is low, the effectiveness will not be met. The problem of education has been studied steadily for a long time, but the learner cannot follow all the changes if only the system is changed. In the age of artificial intelligence[9][10][11] and metaverse, learners must become the subject of the class and lead the class. The reason is that the future society demands collaborative and creative convergence talents[12][13][14]. Moreover, it is necessary to understand that the collaboration capabilities, communication capabilities, and creative capabilities demanded by global leaders or future companies are not independent of each other, but are organically linked to each other. In other words, in university education, rather than reinforcing these competencies individually, the educational system should be integrated.

This study proposes to develop an interactive communication education model to meet the creative convergence-type talent cultivation desired by the future society in the age of artificial intelligence and metaverse[15][16]. It is the interactive communication education that satisfies the educational goals of both the instructor and the learner, so that the smart tools can be actively used and applied to the class. Smart communication tools can be devised in various ways, but the interactive communication tools used in this study are QuizN, Symflow, and Padlet. These communication tools can increase the immersion in class, which is the most important in interactive classes between learners and teachers, and can play a big role in enhancing self-directed learning required by the future society[17]. Moreover, the great advantage of the use

of smart tools is that it enables classes that transcend time and space, real-time feedback, and storage and sharing of information. Based on the basic concept of creativity and the theoretical background of smart tools, this research method derives educational elements for smart tools that can enhance creative convergence, and develops a class model that can strengthen collaboration, communication, and creativity skills. And the scope of this study is proposed as a liberal arts subject in universities.

2. Interaction Communication Tools for Smart Education

The real meaning of interactive communication education is to increase the participation rate of leaners in class and to increase self-directed learning and creativity. Furthermore, the growth of creativity comes from the process of self-learning with interest. An important point in this process is that one-way communication education centered on professors only hinders creativity, but does not help to increase creativity at all. However, it has already been verified by domestic and foreign experts that interactive communication education not only increases the class participation rate of learners, but also triggers interest in class and enables learners to learn with their own motivation[18]. Learning tool for interactive communication education are needed as a way to increase creativity in universities, which are higher education institutions.

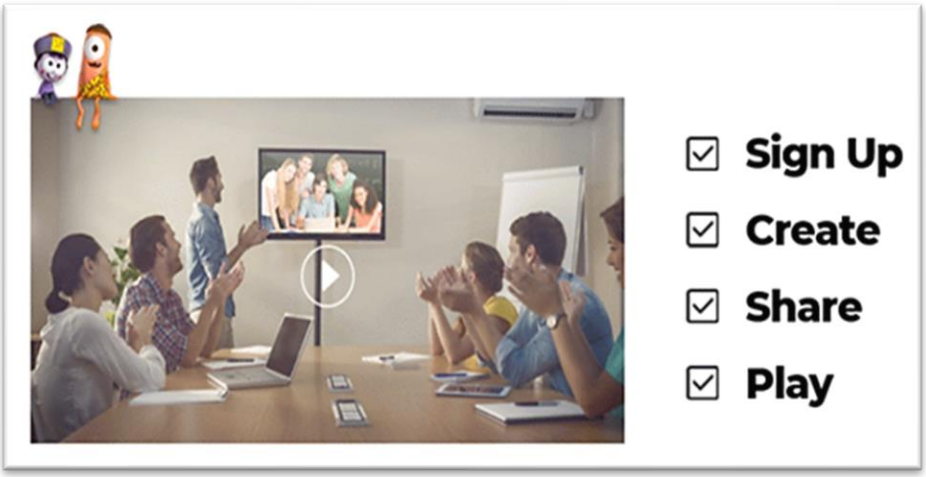
Moreover, as non-face-to-face classes increase due to COVID-19, research on the expansion and plan of online remote education is extremely insufficient. The most prominent advantage of remote education would be fast and accurate feedback. In offline classrooms, many learners cannot receive immediate feedback on presentations or assessments at once, but online remote education is possible. In other words, there are smart tools instead of a test paper to solve a quiz and compare real-time rankings between participants. And in online and offline education, they can support in-class use, after-school assignments, collect learner opinions, and provide learning statistics. The interactive communication education tools proposed in this study are QuizN, Symflow, Padlet, and a brief introduction to the features and utilization of these tools is as follows.

2.1. QuizN

QuizN is a program for real-time interactive communication and it is one of the smart communication tools that instructors can produce various types of quizzes and learners can enjoy participating in classes to directly experience pleasant competition[19]. As shown in <Figure 1>, this program can be easily accessed and used by anyone because it can be registered as a free member. Anyone with a PC or a smart tool can easily produce a quiz show and participate in a quiz game, so it can infuse a sense of immersion and accomplishment into a hard and boring class. Anyone can easily participate and enjoy a real-time quiz show with only a shared URL or PIN number without having to sign up or login.

There is also a Kahoot application that allows teachers to take classes, such as taking quizzes, conducting presentations, and giving feedback using smart phones in real classrooms. However, QuizN is a great real-time interactive class feedback tool that goes beyond Kahoot's function and has the function of Padlet, which are representative of white-board, post-it collaborative learning.

Figure 1. QuizN concept.



QuizN features that learners participating in the quiz show can feel enjoy the fun of mutual competition and immersion in the moment by checking the real-time ranking and results, and enjoy a fun quiz game with lively sound effects and characters applied, and enrich the quiz show, and set various options such as explanation screens, images, and videos etc. This program can be used in various fields that require gamification, such as classes, micro-learning, remote education, marketing like an event & promotion, hobby gatherings, and various invitations. Moreover, quiz or survey can be conducted not only offline classes but also non-face-to-face classes. And the instructor presents assignments and the results can be used as individualized feedback data for students.

2.2. Symflow

Students can share real-time questions and answers, lecture materials, surveys, etc. while watching the live streaming screen without going to the offline classroom. A webinar to increase participation rate can be reconfigured live streaming screen with a screen that include question and answer, quiz, lecture materials, and surveys. Webinar is a compound word of web and seminar, and refers to a video discussion conducted on the web of the Internet. In other words, it is a real-time, interactive seminar between the instructor and the participants using a computer connected to the Internet and a microphone or a smart phone. Symflow has a feature that induce learners' participation by creating quizzes and Q&A during lectures. As shown in <Figure 2>, there are three important functions of Symflow. Presentation can utilize PowerPoint data or screen synchronization with learners. Downflow can make multiple-choice and subjective questions, and Upflow can send questions and recommend other people's questions during learning.

Figure 2. Important features of symflow.

The Symflow program can be used for school classes such as students' note test, achievement check, feedback, communication, and notice. In addition, it can be used in various places such as workshops, lectures, meetings, exhibitions, and conferences depending on how it is used.

2.3. Padlet

Padlet is a web application that allows many people to participate in a single workspace at the same time and attach sticky notes. That is, the padlet is a form of asking and answering facts, content-checking questions, assumption questions, and experience questions using the self-function[20]. For example, if a memo pad attached to a blackboard is shared on the web in a classroom, students can do almost everything that can be done in class with the memo are possible. Furthermore, it is possible to attach files, which can be usefully utilized when collecting photos or data.

Figure 3. Interactive communication education padlet.

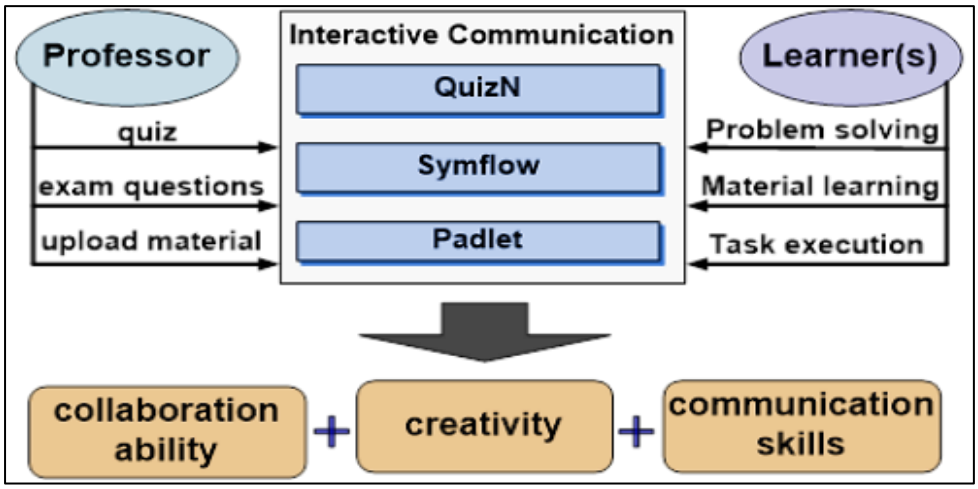
Padlet features that it can make any kind of Padlet the instructor wants, learners can share Padlet address without registering as a separate member, instructor can move memo posted on the Padlet to a desired location, and turn the result of the activity into pdf files. For example, if it can be used in a class, the first thing to do is to upload questions to the Padlet by type. Second, press the empathy button on questions you think are creative. Third, select a few questions that may ask a variety of questions from among the questions and discuss them together. What QuizN, Symflow, and Padlet have in common is that they focus on interactive communication education rather than one-way education. In other words, it is not the education that the professor teaches, but the learner shares with other learners in the process of learning the content of the subject by themselves and finding an answer. The ultimate goal of interactive communication education is to enhance learners' collaboration ability, communication ability, and creative ability to become them into the talent required by future society. In other words, interactive communication education can increase creativity in the process of asking questions and finding a given problem through mutual cooperation between learners or learners, going beyond the existing teaching method in which the instructor explains difficult parts in detail.

3. Model Design for Interactive Communication

Among the conditions that the future society desires, there is a clear reason why talented people with creativity are required in common. Deep Learning(DL), which is emerging greatly in the era of the 4th Industrial Revolution, clusters and classifies data using artificial neural networks, which are statistical learning algorithms. The key to Deep Learning is to classify and predict various types of information. Artificial intelligence is a technology that can realize human learning ability, reasoning ability, perceptual ability, and natural language comprehension through computer programs using this principle. Artificial intelligence is producing many changes in a convenient direction for human life, but on the other hand, artificial intelligence is gradually taking over place in areas that only humans can do. As a result, an increasing number of future experts predict that many jobs that only humans have maintained and developed will

disappear[21]. However, creativity is a unique area to humans that AI can never occupy or possess. The reason why future companies are demanding talented people with creativity is that they need creative convergence talents who can create and manage artificial intelligence. The demand for creativity will become more and more important in the future, and then it is clear that creativity will become a powerful essential competency even if the times change.

Figure 4. Model design for interactive communication.



Therefore, universities, which are higher education institutions, should make efforts to develop teaching and learning methods, contents design and development, and program development in the direction that learners can increase their creativity. First of all, in order to develop creativity, learners' interest and motivation for the class, and voluntary participation must be preceded. Second, it should be necessary to enhance the humanities thinking ability, which has the characteristic of multiplicity. Third, the learners should lead the class so that it becomes an awake classroom rather than a silent classroom. The way to realize them properly should be to develop a class model for interactive communication education.

As shown in <Figure 4>, the interactive communication education model for creative convergence education proposed in this study includes unexpected quiz, evaluation test questions, registration of materials for learners, assignment of tasks, etc., and the learners solve the given problem. learn the registered learning materials, and perform the task. At this time, interactive communication education is conducted using programs such as QuizN, Symflow, Padlet. Through this interactive communication model, collaboration, creativity, and communication skills can be possible to nurture talents desired by the future society.

No matter how good a teaching-learning method is adopted and applied to a class, it is difficult to derive its effectiveness immediately if the learner's participation rate is low. For example, Flipped Learning, a reverse learning method, is being used in many universities in Korea[22][23][24][25]. However, the Flipped Learning-based classes are not very helpful in enhancing the creativity of learners[26]. Most importantly, not all learners in the class have similar abilities. This point simply does not accurately recognize the current trend of the class, either in the offline literacy method or in the Flipped Learning method, but also does not fit the education of the times.

This means that although learners have been constantly working on and researching education problems for a long time, it is the same as not being able to keep up with all learners if only the system is changed. Various programs were introduced in the interactive communication education for the improvement of creativity proposed in this study. The only way to increase creativity is to have the effort and willingness to solve problems on your own. Simply teaching education does nothing to promote creativity. Learners' own unique ideas emerge through research, data collection, editing, and production on their own.

4. Conclusion

This study proposed the development of an interactive communication education model for creative convergence talents. The interactive communication education model should go beyond the scope of the traditional educational and learning method in which the instructor is the subject. And in the proposed interactive education model, the learner should be the subject of the class, and the instructor should help to set the direction of the class and let the learner radiate their talents and limitless creativity. The essence of interactive communication education is to increase interest and immersion in class, to increase participation in class, and to seek development through self-directed learning along with increasing understanding of class. In other words, the questions that learners are curious about are delivered to the instructor in real time, and the instructor can check the understanding of learning from time to time by asking the learners to take a quiz in real time.

As an extension of the learning contents, the instructor presents the task, and the learners organized in small groups conduct research, data collection, editing, and production of the task contents. In this process, mutual communication and finding solutions to problems can enhance the understanding of the class through mutual collaboration, as well as improve the degree of completeness in solving a given problem. Moreover, because it uses interactive communication tools, even if presentation skills are somewhat insufficient, students can fully express their intentions with confidence without feeling embarrassed or ashamed.

Although the scope of this study is limited to liberal arts subjects in universities, it is possible to expand the scope and develop contents linked with adjacent subjects or similar departments. In particular, by further expanding the scope of this study, it is possible to predict common convergence potential by collaborating with neighboring universities. Based on the results of this study, it is expected that it will greatly contribute to the development of education such as program development, content production, and teaching-learning method development for value creation of an academic education model. In particular, given the reality that online distance education is inevitable due to COVID-19, it is expected that the interactive communication education model proposed in this study can be fully utilized.

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6. Appendix

6.1. Authors contribution

	Initial name	Contribution
Author	YK	-Set of concepts ☑ -Design ☑ -Getting results ☑ -Analysis ☑ -Make a significant contribution to collection ☑ -Final approval of the paper ☑ -Corresponding ☑ -Play a decisive role in modification ☑ -Significant contributions to concepts, designs, practices, analysis and interpretation of data ☑ -Participants in Drafting and Revising Papers ☑ -Someone who can explain all aspects of the paper ☑

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