Research on Visual Factors of Local Government Children's Websites

-Focused on Comparative Studies between Korean and American Children's Websites-

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Abstract: Due to ch ildren's internet use rate cli mbing to 93 .3%, m any web sites are opening separate websites excl usively fo r c hildren a nd providing diverse i nformation. E ven i ndependent local go vernments ha ve opened a n e xclusively-for-children website and a re providing public relations information as well as d iverse study materials; however, it seems that research and study are necessary to see if s uch s ites are providing designs wh ich raise ch ildren's in terests wh ile conveying info rmation easily with in its utilizat ion pu rpose. For th is, stu dies regarding v isual factors (lay-out, color, and letterings) of the websites are seen to be required.

In t his resea rch, as t he first step o n st udies regarding e ffective design f or l ocal government websites for children, visual factors of Korean and American children's websites will be compared and studied.

Key words: Children, local governments, web site, lay out, coloring.

1. Introduction

1.1 Necessity of Research

In Korea, one of the highest Internet usage countries, the user age groups are diversely distributed along with the rise of the occupancy rate. Acco rding to the 2008 Internet Usage Surv ey by the National Internet Dev elopment Agency Korea, the internet use rate of th e Korean populations over age 6 is 77.1%(an increase of 11.6% during the last 5 years). The internet use rate among children between the ages 3~9 is 82.2%(a 2.7% increase compared to 2007) and it rose significantly compared to other age groups.

According t o the st udy on i nternet use a mong chi ldren[1], th e in ternet is activ ely utilized as a res ource for children's homework, and the number of Internet education sites targeting children is rising at a rap id speed. As the g ravity o f in ternet usage for edu cational pu rposes of ch ildren is becoming great, o ur ind ependent lo cal governments (local governments from now on) are informing children of their existence and providing diverse study materials by opening children's websites.

Hereupon, it s eems that rese arch a nd study are necessa ry to see whether ch ildren websites o perated by lo cal governments are stim ulating children's interests according to their purpose and providi ng de signs which easily

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[1] KidChosun (Seoul: Chosun Newspaper, July 22, 2004)

convey information. In this research, we will study to what extent our Korean local governments' websites for children are fulfilling these desires and seek methods to improve the attention and satisfaction of children by comparing and analyzing children's websites in Korea and overseas.

1.2 Research Method and Range

As the first step of the study, visual factors (lay-out, color, and letterings) between U.S. State Government websites for children—which installed an e-government starting from 1993, 2 years before Korea—and 4 Korean sites will be compared and analyzed.

Visual factors for 13 children websites included in Seoul City Hall, 4 metropolitan city halls, and 8 district offices for Korea (Daegu and Woolsan metropolitan city halls and Kangwon district office have yet to open a children website) and visual factors of 28 American state government websites which have opened websites for children will be analyzed as the research target.

2. Comparative Study between Korea and America

2.1 Korean Local Government Websites for Children

2.1.1 Color Analysis

Table 1. Color Analysis of Korean Local Government Websites for Children

	1.Gyeongnam	2. Gyeongbuk	3. Jeonnam	4. Jeonbuk	5. Chungnam	6. Chungbuk	7. Gyeonggi	8. Jeju	9. Seoul	10. Incheon	11. Daejeon	12. Gwangju	13. Busan
main page													
color analysis	Dominance Color 9.5GY 9/8	Dominance Color YR 6/14	Dominance Color N9	Dominance Color 7PB 7.5/6	Dominance Color 3Y 7.5/11	Dominance Color 2.5GY 9.5/7	Dominance Color 3.5GY 9.5/4, N9	Dominance Color 2.5Y 8/9	Dominance Color 6BG 9/7	Dominance Color 6.5GY 7.5/12	Dominance Color 6.5B7.5/9 7.5GY 7/9	Dominance Color 6.5GY 7.5/12	Dominance Color 6.5PB 6/14
	Sub Color 2.5P6/14, 5.5G 8.5/7.5 7RP5.5/18, N2	Sub Color N2, 1.5G9/10.5, N9	Sub Color 9.5GY 8.5/14, N2, 5.5G 8.5/7.5	Sub Color N9, 4RP 8/7	Sub Color 7RP5.5/14, 6.5B 7.5/9 N9, 8.5P 4.5/7	Sub Color 2PB5.5/8, 8.5YR 6/6 6R 6/14, N9	Sub Color 3.5Y 8/1, 2PB 7.5/7 7R6.5/4, 8.5YR 6/6	Sub Color 9.5GY 8.5/14, N9 2GY 9.5/10 6BG 7/9	Sub Color N2, 1.5Y 6/9 ,2.5P 6/14	Sub Color 5RP 5/10, 3Y 7.5/11 8.5B5.5/9, 9.5GY 8.5/14	Sub Color 9YR8/5, 2.5Y 8/9, 8.50P 5.5/14	Sub Color 9.5GY 5/11,9R 4/14 5.5YR 6.5/14, 6BG 7/9	Sub Color 6.5GY7/13, 9YR 8/5 N9, 9RP 6/14
	Highlight Color 9.5GY 8.5/14	Highlight Color 9R 3/14	Highlight Color YR 4/12	Highlight Color 5.5R 4/10	Highlight Color 10GY 7.5/14	Highlight Color N1	Highlight Color 4.5BG 5.5/5	Highlight Color N4	Highlight Color 7.5GY 7/9	Highlight Color N9	Highlight Color 9RP 6/14	Highlight Color 1.5Y 6/9	Highlight Color 7.5R 5/14

Table 2. Color Image of Local Government Websites for Children

sort color image	
1	Clear, natural, brisk
2	cute, brisk, elegant, subtle
3	clear, brisk, splendid, elegant, subtle
4	clear, brisk, elegant, subtle
5	cute, brisk, natural
6	brisk, natural, elegant
7	cute, natural, elegant
8	clear, cute, natural, elegant
9	brisk, splendid, natural, subtle
10	cute, brisk, splendid, elegant
11	cute, brisk, splendid, elegant
12	cute, brisk, dynamic, subtle
13	brisk, splendid, elegant, clear

Analyzing the colors of Korean local government websites for children comprehensively[2], one can see that dominant colors raise the visual attention by using basic colors appearing on the color circle such as Blue(28%), Green(28%), Yellow(28%), Orange(7%), White (7%), and more while effects that mingle naturally through the use of similar tones appear. Mainly, vivid colors, whose value and chroma are both high or soft colors of pastel tones with high value and low chroma were used. This reveals the effect of providing enjoyment through the use of various colors as well as giving visual stimuli.

If user emotional adjectives and verbs are analyzed using the Color Image Space of the I.R.I. Color Research Institute, it can be said to be giving familiarity and fun to kids since images which have sense of familiarity while being soft as well as fun, bright, and brisk images are shown together.

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[2] The color analysis method extracts the samples of the dominant color, sub color, and highlight color after extracting RGB value by capturing the main screen of each website. Through the Munsell conversion (ver.6.22), the extracted color is converted into the Munsell color value.

2.1.2 Layout Analysis

Table 3. Layout Analysis of Local Government Websites

type im	age	frequency	rate
layout type 1. Navigation Area on top Main Visual in the middle Body Area on the bottom		4/13 30%	
layout type 2. Navigation Area on top Main Visual on left Body Area on light		6/13 47%	
layout type 3. Free grid		3/13 23%	

When th e layou t form o f th e m ain p age is analyzed , the type with the Navigation Area on the top, the Main Visual in the m iddle, and the B ody Area on the bottom tak es up 30%; o nes with t he Navigation A rea on top, t he M ain Visual on the left, and the B ody Area on the right take u p 47%; and free grid type takes up 23%.

Illustrations were m ainly u sed as th e Main Visual Images while lay-out desi gns ce ntered on curve lines which inspired im ages su ch as softness, freedom , n aturalness, cuteness, enjoyment, and more were used a lot.

2.1.3 Font Analysis

Table 4. Font Analysis of Local Government Websites for Children

font type		frequency	rate
title font	serif ty pe	2/13	15%
	san serif ty pe	9/13	69%
	decorative type	11/13	85%
body font	serif ty pe	0/13	0%
	san serif ty pe	13/13	100%
	decorative type	0/13	0%

The decorative font which reminds us of cute and fun images was used for the title and headlines of local g overnment web sites fo r children while a san se rif ty pe font was use d for the b ody. W ith partial decorative fonts, it s eems that t here are some problems in their readability regarding size, thickness, and color.

2.2 U.S. State Government Websites for Children

2.2.1 Color Analysis

Table 5. Color Analysis of U.S. State Government Websites for Children

nation	1. Utah	2. Oregon	3. Kansas	4. Maine	5. Connecticut	6. Ohio	7. Montana	8. Mississippi	9. Hawaii	10. Vermont	11. Kentucky	12. Louisiana	13. Idaho	14. Indiana
main page														
color analysis	Dominance Color 1.9B 6.9/5.7	Dominance Color 6.2PB1.5/3	Dominance Color 2GY 9.7/7. 5	Dominance Color 7PB 2.7/20	Dominance Color 8GY 2.5/8	Dominance Color 8B 5.4/9	Dominance Color 3Y 8/9	Dominance Color 3PB 3.6/9	Dominance Color 3PB 4/10	Dominance Color 7.8GY 8/10	Dominance Color 8GY 7/9	Dominance Color 6.7PB 3/11	Dominance Color 6GY 8/2	Dominance Color 3PB 4/10
	Sub Color 8.2GY 6.3/12 9.8R 1.4/4.7 9R 3/11.5	Sub Color 1.7P 2/14.5 9.7GY 5.1/11.4 9.1YR 8.2/6.2	Sub Color 9.8GY 7/16 7.7R 4.3/16.5 2GY 9.6/13	Sub Color G 4.5/10 4P 2/13 8.5R 4/16 7.6GY 4.8	Sub Color 4GY 8/11 Y 4/4 6PB 1/15	Sub Color 6B 7.3/9.8 7.7GY 7.3/9.8 3Y 8/12 2GY 9.6/11	Sub Color 8PB 6.8/5 10GY 7/7	Sub Color 6PB 1/9 4B 9/3	Sub Color 6GY 8/10 1.6YR 5/14 6.7PB 2/14	Sub Color 8Y 9/6.8 6YR 7/13 B 8/5	Sub Color PB 4/8	Sub Color 7GY2 3Y 7.6/10	Sub Color 6PB 1.7/8 7GY 1.4	Sub Color 2PB 1/4 2PB 1/7
	Highlight Color 7.7YR 7.2/13.3	Highlight Color 2GY 9/6.7	Highlight Color 6.7PB 1.3/15	Highlight Color 5.3YR 6.8/14	Highlight Color 6P 3/11	Highlight Color 8R 5/20	Highlight Color 5.6YR 2.5/3.7	Highlight Color 8R 5/20	Highlight Color 1GY 9/13	Highlight Color 2R 5/17.7		Highlight Color 8.5R 3.7/13	Highlight Color 3.7G 2/5	Highlight Color 2YR 6/15
nation	15. Maryland	16. Michigan	17. Minnesota	18. Missouri	19. New Mexico	20. NorthCarolina	21. North Dakota	22. Oklahoma	23. SouthCarolina	24. Tennessee	25. Texas	26. Virginia	27. Wyoming	
main page														
color analysis	Dominance Color 7PB 2.5/12	Dominance Color 6.5PB 2/13	Dominance Color B9	Dominance Color 4.5PB 4/6.7	Dominance Color 6.5PB 4/14	Dominance Color 6PB 2/9	Dominance Color 6GY 3/6	Dominance Color 6PB 3/14	Dominance Color 6PB 2.7/8	Dominance Color 1.5PB 5.6/6	Dominance Color 2G 9.5	Dominance Color 3PB 4/6	Dominance Color 2PB7.7/6	
	Sub Color 2.7Y 8/9 6R 3/11.5 1.6Y 7/12 P 1/13 2PB 6/8	Sub Color 7.3GY 8/3.8 1RP 5/7 8Y 9/9.5	Sub Color 7GY 8/4	Sub Color 5.6PB 1.5/7	Sub Color 5.6PB 1.5/7 7B 3.7/5	Sub Color 9B 5/9 5P 8/8 2G 3.5/7	Sub Color 5GY 8/8.5 1RP 7/11	Sub Color 2G 6.4 8GY 8.7	Sub Color 7PB 5/6 6B 10/1	Sub Color 2.7GY 6/2 8.5GY 8.6	Sub Color 3PB 3.8/5 7GY 4.8	Sub Color 7GY 1	Sub Color 7BG 1/3 4PB 2.7/6	
	Highlight Color 2R 4/15	Highlight Color 8R 4/15	Highlight Color 2Y 4/6.5	Highlight Color 7R 3.5/10	Highlight Color 6YR 6/12	Highlight Color 6Y 7/10	Highlight Color 7R 3/12	Highlight Color 6Y 8.6/12	Highlight Color 7P 1.5/10	Highlight Color G 3.8/9	Highlight Color 8R 4/13	Highlight Color 8R 4/17	Highlight Color 2YR1.5/8	

Table 6. Color Image of U.S. State Government Websites for Children

sort	color image	sort	color image
1	cute, brisk, natural, modern	15	brisk, dynamic, splendid, elegant
2	cute, brisk, clear, modern	16	clear, brisk, elegant
3	cute, brisk, dynamic	17	elegant, quiet
4	brisk, dynamic, splendid	18	splendid, dynamic, modern
5	splenedid, modern, quiet	19	splendid, dynamic, modern
6	cute, brisk, natural	20	natural, splendid, modern
7	clear, subtle, quiet	21	cute, splendid, quiet
8	brisk. Clear, dynamic	22	cute, dynamic, subtle
9	cute, dynamic	23	natural, dynamic, quiet
10	cute, brisk, clear, natural	24	brisk, subtle, modern
11	natural, dynamic	25	brisk, subtle, quiet
12	cute, brisk, dynamic	26	cute, brisk, dynamic
13	subtle, modern	27	natural, modern
14	brisk, dynamic, modern		

Analyzing the color of U.S. State government websites for children comprehensively, it is seen that the dominant color use rate is Blue (56 %), White (26%), Green (11%), Yellow (7%) while the Blue color which gives a stable feeing is mainly used. Vivid colors whose value and chroma are both high or soft colors of pastel tones with high value and low chroma were used while kinetic effects are shown by using contrast colors. If user emotional adjectives and verbs are analyzed by using the Color Image Space of I.R.I. Color Research Institute; it shows cute, brisk, and dynamic images while subtle, modern images appeared on the other hand, giving stable feelings.

2.2.2 Layout Analysis

Table 7. Layout Analysis of U.S. State Government Websites for Children

type image	age	frequency	rate
layout type 1. Main Visual on top Navigation Area in the middle Body Area on the bottom Menu Navigation on the left		12/27 44	%
layout type 2. Main Visual on top Navigation Area in the middle Body Area on the bottom Menu Navigation on the light		3/27 1	1%
layout type 3. Navigation Area on top Main Visual in the middle Body Area on the bottom Menu Navigation on the left		3/27 1	1%

Analyzing the layout form of the main page, it was seen that the level 2 in the length grid layouts were dominant with Type 1 (main visual on top, navigation area in the middle, body area on the bottom, menu navigation on the left)at 44%; Type 2 (main visual on top, navigation area in the middle, body area on the bottom, menu navigation on the right) at 11%; and Type 3 (navigation area on the top, main visual in the middle, body area on the bottom, and menu navigation on the left) at 11%.

2.2.3 Letter Font Analysis

Table 8. Letter Font Analysis of U.S. State Government Websites for Children

font type		frequency	rate
title font	serif type	7/27	26%
	san serif type	20/27	74%
	decorative type	14/27	52%
body font	serif type	3/27	11%
	san serif type	23/27	85%
	decorative type	2/27	7%

Regarding the title and headline letter font for U.S. State government websites for children, serif and san-serif styles were used frequently while cute and fun decorative styles suited to the image of children were used just as with Korean local governments. For the body lettering font, Helvetica and Arial styles were used. It looks that since it is a sub menu of the State Government website, the standard lettering style of the same context was used

3. Conclusions

As the result of comparing and analyzing Korean and American websites for children; colors with fun, light, and brisk images were used frequently in Korea while colors giving stable feelings with modern and subtle images of the blue color groups are also used many times. Additionally, if Korea mainly uses the lay-out with emphasis on the main visual centering on illustrations, it can be seen that America emphasizes the contents portion of body area while establishing a more organized grid system. Regarding letter font, Korea seemed to use more decorative fonts than America.

In order for Korea local government websites for children to raise children's interests and ease the delivery of information, it seems that more studies on visual factors suited to the cognitive levels of children users should be performed.

Based on the result obtained from this research, research toward studying the attention and preference of children is planned by surveying content as well as visual factors (layout, color, letter) preferred by children through surveys in local government websites for children. Through this, suggestions toward methods for Korean local government websites for children to provide effective and participatory information to children users will be sought.

4. Citations

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