Effect of Dynamic Information Display Design on Users" Reading Performance and Subjective preference by Using TFT-LCD

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ABSTRACT

This research investigated that the effects of Chinese dynamic information design on TFT-LCD subjects ’ comprehension and subjective preference. This research includes three experiments. The first experiment investigated the effects of speed, jump length, line length, character size, and polarity on subjects ’ comprehension and subjective preference in Chinese leading display. Results of this study showed that while the level of speed was at the fastest level of 300 wpm, subjects preformed significantly better comprehension when the jump length was at 1 cm than at 1.5 cm. In addition, while the level of line length was at the longest level of 20 cm, subjects preformed significantly better comprehension when the speed was at 200 wpm than at 250 and 300 wpm. Regarding subjective preference, subjects showed significantly better preference when the jump length was at 1 cm than at 1.5 cm, and significantly better preference when the line length was at 20 cm than at 10 and 15 cm. Additionally, subjects showed the best preference when the character size was 14 pt, then 12 pt, and the worst preference when the character size was 10 pt. The second experiment investigated the effects of speed, jump length, text/background color combination, and polarity on subjects ’ comprehension and subjective preference in Chinese leading display. This research showed that speed did not significant affect subjects ’ comprehension and subjective preference. The jump length of 0.35 and 0.7 cm resulted in higher comprehension than 1.05 cm and 0.35 had the highest subjective preference evaluating. Additionally, subjects ’ comprehension increase as color difference became larger, but if subjects ’ subjective preference was take into consideration, it ’ s better avoid using color pair of blue/red. In addition, the polarity of dark-on-light resulted in better comprehension and subjective preference, except the color pair of blue/red in subjective preference. The third experiment investigated the effects of speed, typographic, text/background color combination, and polarity on subjects ’ comprehension and subjective preference in Chinese flashing display. The result of this experiment showed that speed did not significant affect subjects ’ comprehension but subjective preference. The middle levels of speed (200 and 250 wpm) resulted in higher subjective preference. The factor of Chinese typographic did a significant effect on subjects ’ comprehension but the wider stroke of bold type resulted in higher subjective preference. In addition, the factors of polarity and text/background color combination did a significant effect on subjects ’ comprehension and subjective preference. The polarity of dark-on-white resulted in better comprehension and subjective preference except the text/background color combinations of black/white and the color pair of blue/red. Similar to the second experiment that comprehension and subjective preference increased with color difference became larger. However, if users ’ subjective preference is taken into consideration; additionally, color combination of color pairs (blue/red) should be avoided to use in spite of its higher color difference. The result of this research could give website designer a guide principle for setting factors.

Keywords : dynamic information ; leading display ; flashing display ; comprehension ; subjective preference

Table of Contents

REFERENCES

[1]Chen, H.C., Chan, K.T., Tsoi, K.C. and Chan, K.T., 1988. Reading self-paced moving text on a computer display. Human Factors, 30(3), 285-291.

[2]Chen, H.C., and Tsoi, K.C., 1988. Factors affecting the readablity of moving text on a computer display. Human Factors, 30(1), 25-33.

[3]Cushman, W. H., 1986. Reading from microfiche, a VDT, and the printed page: subjective fatigue and performance. Human Factors, 28, 63-73.

[4]Granaas, M. M., McKay, T. D., Laham, R. D., Hurt L. D. and Juola, J. F, 1984. Reading moving text on a CRT screen. Human Factors, 26, 97-104.

[5]Juola, J.F., 1995. Reading text presented on a small display. Applied Ergonomics, 26, 227-229.

[6]Lippert, Thomas M., 1986. Color-difference prediction of legibility performance for CRT raster imagery. SID Digest of Technical Papers, XVI, 86-89.

[7]Saito, S., Taptagaporn, S., and Salvendy, G., 1993. Visual comfort in using different VDT screens. International Journal of Human-Computer Interaction, 5(4), 313-323.

[8]Sanders, Mark S. and McCormick Ernest J. (1993). Human Factors in Engineering and Design. McGraw-Hill, Singapore.

[9]Shieh, K. K. and Chen, M. T., 1997. Effects of screen color combination, work-break schedule, and workpace on VDT viewing distance. International Journal of Industrial Ergonomics, 20, 11-18.

[10]Shieh, K. K. and Lin, C. C., 2000. Effects of screen type, ambient illumination, and color combination on VDT visual performance and subjective performance. International Journal of Industrial Ergonomics, 26, 527-536.

[11]Snyder, H. L., Image quality, In: M. Helander (Ed.), 1988. Handbook of human-computer interaction. Elsevier science publishers, Amsterdam.

[12]Wang, A. H. and M. T. Chen, 2000. “ Effects of Polarity and Luminance Contrast on Visual Performance and VDT Display Quality ”, International Journal of Industrial Ergonomics, 25(4), 415-421.

[13]Wang A. H., Chen, C. H., and Chen, M. T., 2002. Effect of leading display design of dynamic information on users ’ visual performance and visual fatigue. Journal of the Chinese Institute of Industrial Engineering, 19(2), 69-78.

[14]Wang A. H. and Chen, C. H., 2002. Effects of screen type, Chinese typography, text/background color combination, speed, and jump length for VDT leading display on users'' reading performance. Submitted to the International Journal of Industrial Ergonomics, 1st revision.

[15]Wang, T. C. and Hou, T. H., 1996. A Study of Effects of Chinese Fonts of Type and Character Size on Reading and Searching Performance.

Journal of Kaohsiung Polytechnic Institute, 3, 1-15.