EFFECTS OF SCREEN, TEXT/BACKGROUND COLOR COMBINATION, CHINESE TYPOGRAPHIC, AND LINE SPACE OF SEARCHING AND READING TASKS

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ABSTRACT

LCD MONITORS HAVE GRADUALLY REPLACED THE CATHODE RAY TUBE (CRT) MONITORS TO BE THE MAJOR VISUAL TERMINALS (VDT). HOWEVER, CRTS ARE STILL WIDELY USED IN MANY VDT WORKSTATIONS. THEREFORE, IT IS NEEDED TO INVESTIGATE THE EFFECT OF MONITOR ON USER'S VISUAL PERFORMANCE AND VISUAL FATIGUE. THEREFORE, TWO EXPERIMENTS WERE DESIGNED IN THIS STUDY TO INVESTIGATE THE EFFECT OF SCREEN TYPE, TEXT/BACKGROUND COLOR COMBINATION, CHINESE TYPOGRAPHIC, AND LINE SPACE OF VDT SEARCHING AND READING TASKS ON SUBJECTS' VISUAL PERFORMANCE AND VISUAL FATIGUE. IN THE FIRST EXPERIMENT, CORRECT RATE OF SEARCHING WAS USED TO MEASURE USERS' VISUAL PERFORMANCE OF SEARCHING TASK AND USERS' VISUAL FATIGUE WAS MEASURED BY CFF (CRITICAL FUSION FREQUENCY) AND SUBJECTS' SUBJECTIVE VISUAL FATIGUE. IN THE SECOND EXPERIMENT, THE VISUAL PERFORMANCE OF READING TASK WAS MEASURED BY READING TIME AND CORRECT RATE OF ANSWERING QUESTIONS ABOUT READING TASK AND VISUAL FATIGUE WAS MEASURED IN THE SAME WAY OF THE FIRST EXPERIMENT. ANALYSIS OF RESULTS SHOWED THAT SCREEN TYPE HAD NO SIGNIFICANT EFFECT ON USERS' VISUAL PERFORMANCE AND VISUAL FATIGUE OF SEARCHING TASK. REGARDING TO READING TASK, SCREEN TYPE HAD NO SIGNIFICANT EFFECT ON CORRECT RATE OF ANSWERING QUESTIONS AND CFF. HOWEVER, IT HAD SIGNIFICANT EFFECT THE READING TIME. THE READING TIME OF SUBJECTS ON LCD WAS LESS THAN THAT OF SUBJECTS ON CRT. CHINESE TYPOGRAPHIC HAD NO SIGNIFICANT EFFECT ON USERS' VISUAL PERFORMANCE AND SUBJECTS' SUBJECTIVE VISUAL FATIGUE OF SEARCHING TASK, BUT IT HAD SIGNIFICANT EFFECT ON CFF. THE CFF OF SUBJECTS ON STANDARD KAI TYPE AND IMITATIVE SUNG TYPE DECREASED MOSTLY. REGARDING TO READING TASK, CHINESE TYPOGRAPHIC HAD NO SIGNIFICANT EFFECT ON USERS' VISUAL PERFORMANCE AND VISUAL FATIGUE. TEXT/BACKGROUND COLOR COMBINATION HAD NO SIGNIFICANT EFFECT ON USERS' CFF AND SUBJECTS' SUBJECTIVE VISUAL FATIGUE OF SEARCHING TASK, BUT IT HAD SIGNIFICANT EFFECT ON CORRECT RATE OF SEARCHING. TEXT/BACKGROUND COLOR COMBINATION HAD NO SIGNIFICANT EFFECT ON USERS' VISUAL FATIGUE OF READING TASK, BUT IT HAD SIGNIFICANT ON EFFECT USERS' CORRECT RATE OF ANSWERING QUESTIONS AND READING TIME OF READING TASK. WHEN THE COLOR DIFFERENCE OF TEXT/BACKGROUND COLOR COMBINATION BECAME LARGER, THE READING TIME BECAME SHORTER AND CORRECT RATE OF ANSWERING QUESTIONS BECAME LARGER. LINE SPACE HAD NO SIGNIFICANT EFFECT ON THE READING TASK OF USERS' CFF AND THE SUBJECTS' SUBJECTIVE VISUAL FATIGUE, BUT IT HAD SIGNIFICANT EFFECT ON CORRECT RATE OF SEARCHING OF SEARCHING TASK. THE CORRECT RATE OF SEARCHING OF SUBJECTS ON SINGLE SPACE (VISUAL ANGLE WAS APPROXIMATELY 17.6 MIN) WAS HIGHER THAN THAT OF SUBJECTS ON 0.5 SPACE (VISUAL ANGLE WAS APPROXIMATELY 8.8 MIN). LINE SPACE HAD NO SIGNIFICANT EFFECT ON THE READING TIME, CORRECT RATE OF ANSWERING QUESTIONS AND SUBJECTS' SUBJECTIVE VISUAL FATIGUE OF READING TASK, BUT IT HAD SIGNIFICANT EFFECT ON CFF. THE CFF OF SUBJECTS ON SINGLE SPACE (VISUAL ANGLE WAS APPROXIMATELY 17.6 MIN) DECREASE LESS THAN THAT OF SUBJECTS ON 0.5 SPACE (VISUAL ANGLE WAS APPROXIMATELY 8.8 MIN).

Keywords : VDT, COLOR COMBINATION, CHINESE TYPOGRAPHIC, LINE SPACE, VISUAL PERFORMANCE, VISUAL FATIGUE.

Table of Contents

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