

Productivity & Fatigue: Assessing eye strain and fatigue during extended workdays in various lighting conditions.

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Background:

Constant use of electronic devices by students and working professionals has raised concerns on eye fatigue, fatigue, and lowering of productivity. Modern devices feature analogous screen brightness modes such as light mode and dark mode, yet few research works compare their implications directly for long working hours. Light mode is generally associated with readability and focus, while dark mode is shown to be more comfortable when used heavily, especially during the evening. However, relative empirical data are still scarce, particularly across user groups and task types. The present paper aims to investigate the impact of lighting modes on fatigue, visual strain, and subjective productivity in university students and working professionals and offers pragmatic suggestions for healthier and more productive digital work life.

Methodology:

A survey was taken with a structured Google Form among students and professionals to gather information on screen time, lighting mode preference, self-reported fatigue symptoms, productivity, and sleep quality, as well as demographic information. The data were processed using descriptive statistics and clustering analyses to ascertain usage patterns and symptom reporting.

Results:

Findings indicate increased eye strain and fatigue were reported in light mode, compared with dark mode. Light mode was slightly better correlated with productivity ratings of reading and academic work. Symptoms experienced by the majority were dry eyes, headaches, and blurred vision, while nearly half of the users also complained of sleep disturbances after extended late-night usage, particularly in light mode. Clustering produced groups of individuals that corresponded to night-owl dark mode lower-strain users, light mode daytime readers higher-productivity users, and overloaded users exhausted regardless of the mode utilized.

Conclusion:

The results support that dark mode enhances visual comfort and reduces fatigue, and light mode has the ability to support temporary readability and attention. Interestingly, it is highlighted in the study that total screen use and break frequency are more related to fatigue than lighting mode alone. The results contribute to evidence-based recommendations for optimal digital health and performance at schools and workplaces.

Keywords:

Eye Strain, Fatigue, Productivity, Dark Mode, Light Mode, Digital Well-being.

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