

Identifikasi Parameter Atensi Optimal pada Mahasiswa Melalui Eye-Tracking dalam Level Beban Kognitif yang Berbeda

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Abstrak. Penelitian ini bertujuan untuk mengidentifikasi parameter fisiologis atensi optimal berdasarkan variasi beban kognitif menggunakan perangkat *eye-tracker*. Stimulus berupa tugas n-back spasial yang digunakan untuk memunculkan kondisi atensi rendah (1-Back), sedang (2-Back) dan tinggi (3-Back). Tiga metrik utama dari *eye-tracker* yang dianalisis, yaitu *average fixation (AF)*, *average left pupil (ALP)*, dan *average right pupil (ARP)*. Selain itu dari pengerjaan tugas N-Back dalam eksperimen didapatkan hasil akurasi dan waktu respons. Untuk manipulasi beban kognitif digunakan skala NASA-TLX yang diisi partisipan sebelum pengerjaan dan sesudah setiap sesi. Analisis RM ANOVA menunjukkan bahwa ALP dan ARP mengalami perubahan yang signifikan seiring peningkatan level tugas, sedangkan AF tidak menunjukkan perbedaan yang signifikan. Selain itu uji Friedman Test menunjukkan hasil yang signifikan untuk akurasi dan waktu respons N-Back serta NASA-TLX. Temuan ini menunjukkan bahwa beban kognitif sedang mampu memunculkan atensi optimal yang dilihat melalui metrik mata dan performa partisipan dibandingkan beban kognitif rendah dan tinggi.

Keywords: *atensi, eye-tracker, tugas n-back, pengukuran fisiologis*

Identification of Optimal Attention Parameters in Students Through Eye-Tracking at Different Levels of Cognitive Load

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Abstract. This study aimed to identify the physiological parameters of optimal attention based on varying levels of cognitive load using an eye-tracker device. A spatial n-back task was used as the stimulus to induce low (1-back), moderate (2-back), and high (3-back) attention conditions. Three primary eye-tracking metrics were analyzed: average fixation (AF), average left pupil (ALP), and average right pupil (ARP). Additionally, accuracy and response time were obtained from participants' performance in the n-back task. To assess the effectiveness of the cognitive load manipulation, the NASA-TLX scale was administered before and after each session. Repeated Measures ANOVA revealed that ALP and ARP significantly changed with increasing task levels, while AF showed no significant differences. Furthermore, the Friedman test showed significant results for n-back accuracy, response time, and NASA-TLX scores. These findings indicate that moderate cognitive load elicited more optimal attention, as reflected in eye-tracking metrics and participant performance, compared to low and high cognitive loads.

Keywords: *attention, eye-tracker, n-back task, physiological measurement*