

## INTISARI

Kecelakaan maritim membutuhkan perhatian yang sama dengan kecelakaan di darat dan udara. Pada tahun 2010 – 2019, tercatat terdapat 26.071 kecelakaan maritim. Walaupun operator *vessel traffic service* (VTS) bertugas untuk menjaga kelancaran lalu lintas maritim, ada beberapa faktor yang dapat mengganggu kinerja operator VTS yang dapat mengakibatkan situasi berbahaya. Dua faktor tersebut adalah kurangnya kemampuan kognitif atau *situational awareness* (SA) dan *mental fatigue*. Walaupun upaya untuk menangani kurangnya kemampuan kognitif telah ditemukan, efektivitas solusi ini belum ditemukan. Dengan demikian, penelitian ini bertujuan untuk mengidentifikasi pengaruh *mental fatigue* dan sistem instruksi, sebagai upaya menangani kemampuan kognitif, terhadap kemampuan SA dan *eye movement*.

Penelitian dilakukan dengan 12 subjek penelitian yang terdiri dari 6 mahasiswa dan 6 mahasiswi. Subjek penelitian telah memenuhi beberapa syarat, yaitu pernah menggunakan peta untuk menuju suatu tempat, pernah bepergian menggunakan kapal, pernah memainkan permainan simulasi, dan telah menonton video penjelasan VTS yang disediakan. Eksperimen dilakukan dengan meminta subjek penelitian untuk menonton video dan menjawab pernyataan SATEST dan instruksi. Kondisi yang diberikan adalah *mental fatigue* dan sistem instruksi. Ketepatan jawaban, durasi waktu menjawab, dan *dwelling time* digunakan untuk mengetahui pengaruh.

Hasil penelitian menunjukkan bahwa *mental fatigue* tidak berpengaruh signifikan terhadap kemampuan SA operator VTS. Sementara itu, *mental fatigue* berpengaruh signifikan terhadap *dwelling time* di AOI Lingkungan ketika ada sistem instruksi. Perbedaan signifikan juga ditemukan oleh sistem instruksi terhadap *dwelling time* di AOI instruksi, dan *dwelling time* di AOI CRA ketika *mental fatigue*. Selain itu, SA dan *dwelling time* memiliki korelasi tidak signifikan dan lemah.

**Kata kunci:** VTS, *mental fatigue*, sistem instruksi, *situational awareness*, *dwelling time*, AOI

## ABSTRACT

Maritime accidents need the same attention as accidents on land and air. In 2010 – 2019, there were 26,071 maritime accidents recorded. Although the vessel traffic service (VTS) operator is tasked to maintain the flow of maritime traffic, there are several factors that can interfere the performance of the VTS operator, which can result in a dangerous situation. The two factors are the lack of cognitive ability or situational awareness (SA) and mental fatigue. Even though solution for the lack of SA has been found, the effectiveness is not yet discovered. Thus, this study aims to identify the effect of mental fatigue and the instruction system, as a solution to increase cognitive abilities, on SA and physiological parameters.

The research was conducted with 12 research subjects consisting of 6 students and 6 female students. The research subjects had fulfilled several requirements, namely having used a map to get to a place, had traveled by ship, had played a simulation game, and had watched the VTS explanation video provided. The experiment was conducted by asking the research subjects to watch a video and answer the SATEST statements and instructions. The conditions given are mental fatigue and an instruction system. The accuracy of the answer, duration to answer, and dwelling time are used to determine the effect.

The results of the study showed that mental fatigue has no significant effect on SA ability of VTS operators. Meanwhile, mental fatigue has a significant effect on dwelling time in AOI Environment when there is an instruction system. A significant difference was also found on dwelling time in AOI instructions, and dwelling time in AOI CRA when mental fatigue that is caused by instruction system. In addition, SA and dwelling time have insignificant and weak correlation.

**Keywords:** VTS, mental fatigue, instruction system, situational awareness, dwelling time, AOI