

INTISARI

Situation awareness didefinisikan sebagai pemahaman dan kepekaan terhadap elemen-elemen yang ada di sekitar kita dan merupakan salah satu faktor penting yang berpengaruh dalam pengambilan keputusan pada sebuah sistem yang kompleks. Beberapa metode banyak digunakan untuk mengukur *situation awareness*, di antaranya, *online (real time) probing*, *offline (freeze) probing*, *objective measures*, dan teknik *self rating*. *Quantitative Analysis of Situation Awareness (QUASA)* merupakan salah satu metode pengukuran *situation awareness* yang menggabungkan antara *objective measures* dan *self rating*. Akan tetapi, apakah pengukuran QUASA ini dilakukan menggunakan *online* atau *freeze probing* masih menjadi perdebatan. Tujuan dari penelitian ini adalah membandingkan pengukuran QUASA *online* dan *freeze* untuk mengukur *situation awareness*.

Responden dalam penelitian ini sebanyak 16 orang mahasiswa dengan pengalaman mengemudi 14 ± 5.4 jam/minggu. Setiap responden melakukan simulasi mengemudi selama 20 menit. Dalam satu kali simulasi mengemudi, *situation awareness* diukur menggunakan pertanyaan QUASA pada saat responden melakukan simulasi (*online probing*) atau ketika simulasi dihentikan sementara (*freeze probing*). Untuk menguji konsistensi hasil pengukuran secara *online* dan *freeze*, simulasi dilakukan dengan pemberian tingkat kepadatan lalu lintas yang berbeda di simulasi pada hari berikutnya.

Hasil penelitian menunjukkan bahwa *objective measure* dari QUASA yang ditunjukkan dengan *situation awareness (SA) score* pada teknik pengukuran *online probing* lebih tinggi dibandingkan dengan *SA score* pada teknik pengukuran *freeze probing* ($P < 0.05$). Sementara itu, hasil dari *self rating (perceived SA)* pada teknik pengukuran *online probing* dan *freeze probing* tidak menunjukkan adanya perbedaan yang signifikan ($P > 0.05$). Hasil serupa juga ditunjukkan ketika simulasi dilakukan pada kondisi kepadatan jalan yang lebih padat, di mana *SA score* pada teknik *online probing* lebih tinggi dibandingkan teknik *freeze probing* ($P < 0.05$), tetapi tidak berbeda signifikan antara *online probing* dan *freeze probing* untuk *perceived SA*. Hasil kalibrasi SA yang menggabungkan antara *objective measures* dan *self rating* menunjukkan bahwa responden cenderung *overconfident* pada saat pengukuran secara *online* ataupun *freeze probing*. Akan tetapi, ketika pengkondisian kepadatan lingkungan dilakukan, kalibrasi SA mengalami perubahan pada teknik pengukuran secara *online*. Dari hasil penelitian ini disimpulkan bahwa teknik pengukuran QUASA menggunakan *freeze probing* lebih konsisten dibandingkan dengan *online*.

Kata kunci: *Situational Awareness, Quantitative Analysis of Situation Awareness (QUASA), Online probing, Freeze probing*

ABSTRACT

Situational awareness is defined as understanding and awareness of the surrounding environment and it is one of important factors that influence decision making in a complex system. Currently, there are several methods in measuring situation awareness, including online (real time) probing, offline (freeze) probing, objective measures, and self rating techniques. Quantitative Analysis of Situation Awareness (QUASA) is one of measurement methods that combines objective measures and self rating technique. However, whether the measurement is performed using online or freeze probing remains debatable. The purpose of this study is to compare online and freeze probing in measuring situation awareness using QUASA technique.

Participants in this study were 16 students with 14 ± 5.4 hours/week of driving experience. Each participant performed driving simulation for 20 minutes. For each driving simulation session, situation awareness was assessed using QUASA probes while the participant performing driving simulation (online probing) or while the simulation was paused (freeze probing). In order to test the consistency of online and freeze probing, driving simulation was performed with different traffic density level in separated day.

The results of this study showed that the objective measure of QUASA, represented by situation awareness (SA) score was significantly higher for online probing than that for freeze probing technique ($P < 0.05$). In contrary, there was no significant difference in self rating measure between online probing and freeze probing technique ($P > 0.05$). Similar results were also found when driving simulation was performed in higher traffic density, SA score was significantly higher in online probing technique than that in freeze probing technique ($P < 0.05$) with no significant different in perceived SA between two techniques. SA calibration that combines objective and self rating measures showed that participants were overconfident in answering the probes for both techniques, However, while performing driving simulation in higher traffic density, there was a slight change of SA calibration in online technique. From these results it can be concluded that freeze probing technique was more consistent than online probing technique in measuring situation awareness using QUASA.

Keywords: *Situational Awareness, Quantitative Analysis of Situation Awareness (QUASA), Online probing, Freeze probing*