A Case Study of A Navigator’s Sea Aptitude Using Body Response to Visual Simulation

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We describe the relationship between a navigator’s aptitude and the body’s center of gravity and/or heart variability while using a ship’s bridge simulator. Navigator aptitude relates directly to kansei (the sense for ship handling/common sense) because his/her understanding of what is right or wrong for the ship affects his/her decisions. Common sense is usually employed by professional mariners; however, mistakes sometimes occur on training or merchant ships with multinational crews. Japanese maritime colleges have made entrance examinations and sea aptitude training easier. But professors need to pinpoint student aptitude by developing an evaluation method of kansei measuring the center of gravity and/or heart rate variability utilizing the effects of Human-Computer Interaction on a simulator with a visual system.

The use of a simulator in the education, training, and research at maritime schools and shipping companies, and its efficiency in education and training are recognized as effective at reproducing reality by users (educators and specialists). However, because education using the simulator is still evaluated based on the experience of specialists, it is not fully objective. The art of a navigator is an historical legacy but the outline of the art has not been clarified despite being handed on from sailor-to-sailor. Additionally, each student’s kansei has a direct effect upon his success at sea. The great advantage of the simulator is that it offers educators the ability to reproduce the same situation for all students. The fixed environment makes it relatively easy to determine the kansei which can be influenced even by a little change in natural surroundings. The evaluation of kansei and aptitude by using the physiological response to the simulator with the quantitative indices for the navigator is a new important trend in the educational evaluation methodology and the discovery of better human-ship systems. Knowing who is a ‘ship-friendly’ navigator can ultimately reduce casualties at sea.

**Keywords** body response; simulation; sea aptitude