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Demonstrating professional intersubjectivity: The instructor's work in simulator-based learning environments

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ABSTRACT

Maritime traffic, like most traffic, is rule-governed. In situations in which multiple vessels traffic the same waters, anti-collision regulations enable bridge teams to coordinate their actions with those of other vessels. In maritime education, simulators provide a safe environment for students to begin practicing the application of anti-collision regulations to different traffic situations. This study explores how aspects of rule appliance, analytically understood as professional vision and professional intersubjectivity, are trained in a simulator environment by analyses of a video-recorded episode from a navigation course. The results show how instructions during the scenario are continuous achievements that build on an instructor's ability to recognize the fit between learning objectives and on-going activities in the simulator as they unfold. These embedded assessments and their subsequent demonstrations draw on several social and material resources in the simulator environment. In the simulator, the instructor demonstrates the rule system as a dialogical practice where one interprets each other in line with the rules in negotiations between vessels. This interpretation requires a level of professional intersubjectivity that goes beyond merely following rules, towards seeing oneself through the eyes of others with regard to the intentions projected in one's manoeuvring actions.

1. Introduction

In this study, we explore how navigation and rule appliance are trained in a high-fidelity simulator environment in maritime education. Learning to navigate a large vessel in heavily trafficked waters implies learning to master a complex work task. In the maritime profession, where mistakes and errors can lead to devastating accidents, theoretical knowledge is considered insufficient to prepare students for navigating ships in trafficked waters. Instead, simulators are seen as providing a safe learning environment for students to train the appliance of anti-collision rules that coordinate traffic at sea (Taylor, 1998). In controlled simulator environments, exercises can be designed to train and assess specific learning outcomes. Furthermore, exercises can be designed to fit students' levels of understanding, adding or reducing layers of task complexity. Simulator exercises also offer possibilities to change scenarios to fit student performance or even pause scenarios for feedback and discussion (see e.g. Maran & Glavin, 2003). The practice of simulator-based training is well established in maritime education today and is also regulated in the *International Maritime Organization's* (IMO) convention *Standard of Training, Certification and Watchkeeping for Seafarers* (STCW). To ensure that future professional mariners can act properly and safely in their work practice, this convention stresses that simulators should be used for both training and assessment. The latest update to the STCW convention, the 2010 Manila Amendments,

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focuses more on proficiency and so-called non-technical skills than previous conventions. This implies that the issue is not whether rule appliance should be trained in simulators, but, rather, how rule appliance is currently trained in maritime education.

The study is designed as a workplace study, which is an approach dedicated to examining the intricate relationships of social interaction and technology (Luff, Hindmarsh, & Heath, 2000). In line with this approach, in this study video-recordings of second year master mariner students' training to cross the Dover Strait in simulator-based scenarios are analysed (cf. Heath, Hindmarsh, & Luff, 2011). The study draws on Goodwin's (1994) work to explore how professional vision and professional intersubjectivity are demonstrated by the instructor in a simulator exercises for training rule application. Goodwin suggested that 'seeing' and interpreting the world through the eyes of a professional is the basis for developing the kind of professional intersubjectivity that is crucial in a community of competent professionals. Even if bridge teams on different vessels never meet, as is often the case, they expect of other professionals to be able to see and categorise the world in accordance with the discourses of the profession. Hence, in the context of sea traffic, developing professional intersubjectivity is a fundamental aspect of being able to coordinate with others in traffic. However, as professional vision—and, thereby, professional intersubjectivity—are situated in the social, material and cultural world within communities of practice, such skilled seeing and interpreting must be subjected to instructions and learning. In this study, we ask the following research questions:

a) How does the instructor scaffold the students towards professional vision and professional intersubjectivity in instructions of rule appliance in on-going simulator-based scenarios?
b) How does the instructor use the different socio-material resources in the simulator-based learning environment in these instructions?

The article is structured as follows: In Section 2, a contextual background on the work practice for which the students are training (i.e. what it means to apply maritime anti-collisions rules in practice) is provided. In Section 3, the theoretical framework of the study is presented. In Section 4, the research methods are discussed, and in Section 5, a detailed analysis of a single instructional episode is conducted. The results of the analysis are discussed in Section 6 and concluded in 7th section of the article.

2. Background: training to apply rules in practice

Simulator-based training in maritime navigation courses aims to prepare students for professional work practice, such as, in this case, learning to navigate a vessel under different traffic conditions. At sea, the route ahead is unstable and moving and visibility might be restricted due to challenging weather conditions. Furthermore, vessels in traffic at sea today are massive objects that are slow to respond to changes in speed or direction (Bailey, Housley, & Belcher, 2006). As a consequence, it is difficult to see where a vessel is going by quickly glancing through the window at the bridge. The use of different technologies, such as electronic charts, GPS and radar equipment, aids bridge teams in determining their own vessels' position as well as monitoring the course, speed and distance of other vessels. In addition to establishing and maintaining transparency in traffic systems, the *International Regulations for Preventing Collisions at Sea* (COLREG)[1] requires that each vessel shows intentions clearly and maintains a close look-out to interpret the actions of other vessels. This is done primarily in accordance with a rule system of different and distinct actions, such as turning angles. When actions are unclear, other forms of communication (e.g. the use of different sounds, signals and/or radio communication) should be attempted. In other words, in situations in which multiple vessels are trafficking the same waters, anti-collision rules enable each bridge team to both communicate their own actions and interpret the actions of other vessels (Taylor, 1998).

Like most traffic, maritime traffic is a rule-governed practice, and all vessels at sea are obliged to follow anti-collision regulations (COLREG). The main function of traffic rules is to regulate and maintain an order based upon which the people working in the vessels can coordinate their actions (Belcher, 2002; Taylor, 1998). In research, the rules are often described primarily as instructions that guide behaviour and, thus, providing knowledge about how to proceed in different situations (see e.g. Sharrock & Button, 1999; Suchman, 2007). Rules often take the form of general templates for actions, since it is impossible to specify all the different possibilities that might arise in the actual situation. From this perspective, the formulations of rules are, to different degrees, always open because they are so inherently contingent on the specific circumstances of the situations to which they apply. Rules can be salient in one situation, but not in another. Hence, rules are seen as guidelines for behaviour, rather than as scripts to follow slavishly or blindly (Sharrock & Button, 1999). The anti-collision regulations that serve as the 'rules of the road' in maritime traffic are no exception. As Belcher (2002) emphasises in his sociological reading of COLREG, the regulations provide only general guidelines for application. This means that they specify no exact distances, time frames or actions. It is also important to recognize that the regulations highlight that all collision avoidance should be undertaken without the need for radio communication. Instead, actions taken to avoid collision should be 'positive, obvious and made in good time'. Accordingly, such actions should be based on 'good seamanship', which is highly situation-dependent (Taylor, 1998). As Taylor points out, rules are socially defined; suggesting that the meaning of, for example, 'safe distance' is a mutual agreement between vessels, taking into account the prevailing circumstances of the situation. This largely wordless negotiation requires the ability to both interpret others in line with the cultural discourses of the situation-specific meaning of 'good seamanship' and an understanding of how one's own actions will be interpreted by other professionals.

[1] IMO writings on the COLREG convention: http://www.imo.org/en/About/conventions/listofconventions/pages/colreg.aspx

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