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► **To cite this version:**

Alcino Ferreira. Maritime English in the Bridge Simulator. International Maritime English Conference - IMEC 31, Sep 2019, Mariehamn, Aland Islands, Finland. hal-03187202

HAL Id: hal-03187202

<https://hal.science/hal-03187202>

Submitted on 31 Mar 2021

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Maritime English in the Bridge Simulator

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Abstract

Full mission bridge simulators have been used for the teaching of ship handling and other technical skills such as the use of navigation equipment and electronic aids for many years. The paper proposed will explain how this educational technology is used for Maritime English classes, at Ecole Navale, the French Naval Academy.

The theoretical framework is that of game-based learning and simulation, stemming from the psychological theory of “flow” (CSÍKSZENTMIHÁLY, 1990). The paper will explain why simulation can improve learning, and how this can be put in practice in the ME classroom, explain what are its advantages and limits.

At Ecole Navale, simulation sessions usually last two hours, with learners rotating at each function on the bridge. Learners are typically assigned a transit between two points, and must deal with routine conversations over the VHF radio (with port control, VTS, etc.). As unexpected events happen (such as technical problems, ship interrogations, vessels in distress, priority VHF messages, etc), learners must also use their VHF skills (including the SMCP) to solve situations.

Keywords: *ship’s bridge simulator, roleplay, game-based learning, flow, simulation*

Introduction

The early 21st century has seen the advent of the action-oriented approach, as advocated by the Common European Framework of Reference for Languages (CEFR, 2001), which has gradually replaced the communicative approach in many maritime teaching institutions. This has fostered the development of simulations and roleplaying games for learning, in particular because some of these have become possible thanks to the use of recently developed educational technologies, previously not available. Such tools, because they are now more realistic, allow

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for a more immersive experience for the learner, thus allowing increased levels of engagement. Full-mission bridge simulators, in particular, which were once only used by navigation professionals, are now powerful and easy enough to use to be utilized also in the language class, by teachers who are “marinated” language specialists, and not necessarily former seafarers or specialists of the technologies present on a vessel’s bridge.

This paper will first introduce our theoretical framework, which is that of learning artefacts, and explain how these have shifted our perspective from mediation to roleplay. We shall briefly present the psychology theory of “flow” (Csikszentmihalyi, 1990), explain why this phenomenon should be sought and what its benefits are in a learning environment, as well as describe the conditions required for it to happen. Lastly, this paper will describe one possible example of the application of this theoretical framework (the use of full-mission 3D bridge simulators), analyze its implementation, and attempt to identify the advantages and caveats of this approach.

Theoretical framework: mediation, media, roleplay

Mediation

Vygotski (1934), Freinet (1956), and later Bruner (1983), Houssaye (1998) and Larose and Peraya (2001) have defined the theoretical framework of pedagogical mediation. Stemming from socio-constructivism, this theory conceives the teacher not as a mere source of knowledge which should be “imparted” to fairly passive learners, but as a facilitator, a guide, in the discovery and understanding of the learning material, a mediator between the learner and the knowledge.

However, in a teaching/learning situation, the teacher is not the only such mediator. All learning resources used by both teachers and learners in the teaching/learning process (what Rabardel and Verillon (1985) have called “learning artefacts”) participate to this role. As Rabardel (1995) has shown, there are profound implications to the use of learning artefacts. Indeed such artefacts modify the number and the nature of the actions conducted by the learners, as they “use the artefacts to alter the real world” (Rabardel, 1992, p. 10). In an instrumented learning situation, interactions are thus more numerous (because adding one element increases the number of possible interactions), but also of a different nature (new interactions appear between the learner and the artefact and between the learner and the knowledge through the artefact).

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In Houssaye's model (1998) the teaching/learning situation is triangular (comprising the knowledge, the teacher, and the learner). Interactions are thus of three types: "learning" (between learner and knowledge), "teaching" (between teacher and knowledge), and "training" (between teacher and learner). According to this author, the teaching process (which he understands as, *ex-cathedra* and primarily transmissive), being focused on the teaching material (the knowledge itself), forbids mediation. Thus, less transmissive pedagogies focus on the "training" process, placing the teacher in a middleman role, leaving most of the activity to the learner (Dewey, 1938). Such activities, which focus on the learning process, allow the learner (constructivism) or group (socio-constructivism) to play the mediating role themselves (Houssaye, 1988, p. 178). As Faerber (2004) explains, groups favor socio-cognitive conflicts (Perret-Clermont, 1979), which by definition cannot happen with individuals. These socio-cognitive conflicts are essential to the deconstruction/reconstruction process required for learning (understood as the modification of pre-existing knowledge).

Media, and didactic ergonomics

To Rabardel (1995) and Rézeau (2001, 2002), the didactic work of the teacher adds one node to Houssaye's triangular model, making it a diamond: the learning media. Hence, the teacher is seen a learning mediator and a learning media designer.

It is important to mention that new media, and in particular digital media and learning technology objects, have specific characteristics which make them prone to new types of interactions, in particular in the context of language learning. Bertin (2001, 2003) has proposed the concept of didactic ergonomics, a theoretical approach of teaching/learning technology which aims at better fitting such technology to the teaching/learning goal(s) it seeks. In the context of language learning, didactic ergonomics are defined as an attempt to describe and characterize the observable interactions in a teaching/learning situation which relies on one or several digital media, in order to infer optimal conditions for the integration of such digital tools. At the core of the theory is the fact that 'educational technology is justified only when the teaching/learning material has been (re)designed specifically with the particular nature of the media in mind (...) how it can improve the learning process' (Bertin, 2003). In short, didactic ergonomics look at what the new media *adds* to the teaching/learning process.

As we shall see, 3D simulation has allowed new forms of learning interactions and new class practices to emerge. Chief among those is educational live-action roleplay.

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Task-based approach and roleplay

In a formal teaching/learning situation, action and communication go together, because of the social interaction between the nodes of the pedagogical diamond. Indeed as Grobois states: “(...) the social dimension inherent to learning, set it within a theory of social action, and hence of co-action. In other words action and communication are bound in a context of social interaction” (Grobois, 2012, p. 83). It is the task-based approach which most logically stems from this observation. Nunan defines a task as “(...) a piece of classroom work which involves learners in comprehending, manipulating, producing or interacting in the target language while their attention is principally focused on meaning rather than form” (Nunan, 1989, p. 19).

Puren (2004), nonetheless, establishes a clear distinction between *tasks* (designed primarily for learning) and *action* (primarily aimed at social interaction). To him there is indeed a notable difference between a learner and another user of a language. Yet, it seems to us that simulation and roleplay games (frequently used in task-based learning as well as in the communicative approach) tend to blur this difference.

For Narcy-Combes (2005), it is important to distinguish macro-tasks from micro-tasks. To this author, macro-tasks are akin to real-life social practices, potentially prone to causing social interactions between learners, in context. Thus, they should focus on meaning, on goals and ends, rather than form. Later, once learners run into difficulties in accomplishing these macro-tasks, micro (language) tasks will focus on questions of form.

The use of digital technologies has facilitated the implementation of the task-based approach, since the early 2000s. These technologies allow for the learners to be put in a position to be social agents, capable of accomplishing tasks which are not solely language-oriented, of collectively solving problems, through interaction. In doing so, the socio-constructivist constraints of the approach will (more often than not) *increase* the learners’ motivation and engagement (Grosbois, 2012, p. 84). Our own research (Ferreira, 2010, 2014) has led us to take this approach further: if the entire learning environment (Legendre, 1988 and Germain, 1989) is an integrated immersive learning situation, specifically designed and built within a digital system, by a teacher (thus with a teaching/learning goal), and in which the learner will accomplish tasks that are very similar to those a professional would accomplish on the job, then the media thus created (i.e. the “simulation”), that alternate reality, is a “serious game.” The design process that leads to such creation, we have proposed to name “pedagogical playification” or “pedagogical ludification”. The theoretical framework of our action is thus that of a particular type of learning artefact: that of serious games, i.e., learning artefacts that are so

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immersive that while the learner is in the learning simulation he/she no longer cares about the meaning/form of the words he hears and says, but focuses only on the *action* which they permit. The task-based approach thus focuses on the definition of the macro-tasks, and lets learners define, accomplish and evaluate the required corresponding micro-tasks, even though, as Chini (2010, p. 172-174) warns, a reflection on the rules that govern the language should not be overlooked lest we forget that there is indeed a difference between learning (in which correction exists) and mere practice.

Serious play

Serious play: a long tradition in military history

Play is one of the oldest and most primitive forms of (adaptive) learning, one we share even with some animals (Van Eck, 2006). Surprisingly, the phrases “serious play” and “serious game” are not oxymorons: for Huizinga (1938), the contrary of “game/play” is not “serious” but “reality”. In his famous *Homo Ludens*, he defines play as “a free activity standing quite consciously outside “ordinary” life as being “not serious,” but at the same time absorbing the player intensely and utterly. (...) It proceeds within its own proper boundaries of time and space according to fixed rules” (1988, p. 15).

The military in general, and military academies in particular, have long pioneered the field of serious play. The first formal military simulation dates back to the *Kriegspiel*, in Prussia, in the early 19th century. Since, armies and navies have played for training, in all fields and for all subjects, academic or technical. Communication in general, and naval communication (thus in English) in particular, are no exception. Interestingly, the CEFR (2001) has since sided with this approach, in defining learners as “social agents, i.e. members of society who have tasks (not exclusively language-related) to accomplish in a given set of circumstances, in a specific environment and within a particular field of action.” (CEFR, 2001, p. 9). When we use a bridge simulator in a marine communication class, we aim at “going beyond exclusively language-related skills and engage learners in a global task, in order to train not only speakers, but social agents” (Bertin, 2003).

The theory of “flow”

Recent research in neurosciences has shown that play induces a particular state of consciousness in which the subject’s ability to rapidly and reliably solve complex situations, to propose relevant solutions to multifactorial problems even when under pressure, and come up

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with efficient innovative solutions, is increased (Kounios & Beeman 2009, Carey 2010, Sussan 2011, Guillaud 2013). Czech psychologist M. Csikszentmihalyi (1990) has named this phenomenon “flow”, i.e. the particular mental state of a person who is completely immersed in what he/she is doing, in a maximal state of concentration, of focus. The person then experiences total engagement and a feeling of achievement.

1	Reasonable level of difficulty	“We confront a task we have a chance of completing”
2	Concentration	“We must be able to concentrate on what we are doing”
3	Clear objective(s)	“The task has clear goals”
4	Feedback	“The task provides immediate feedback”
5	No distraction	“One acts with a deep but effortless involvement that removes from awareness the worries and frustrations of everyday life”
6	Feeling of control	“People can exercise a sense of control over their actions”
7	No concern for self Yet, increased sense of self	“Concern for the self disappears, yet paradoxically the sense of self emerges stronger after the flow experience is over”
8	Altered perception of time	“The sense of the duration of time is altered ; hours pass by in minutes, and minutes can stretch out to seem like hours”

Table 1 - Characterizing “flow” (Csikszentmihalyi, 1990: 49)

Csikszentmihalyi (Table 1) has defined “flow” with the following eight criteria:

- The goal (or goals) is clearly defined: rules and expectations are well understood.
- The level of difficulty is acceptable: the task at hand is challenging enough to generate interest, and yet within the range of what the learner is capable of accomplishing with his current knowledge and abilities, albeit with the (limited) help of a teacher or a co-learner.

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- The task is autotelic: it is satisfactory to achieve in and by itself. It is thus not perceived as a chore, or as work. In simple words, it must be “fun” to do.
- “Flow” demands direct and immediate feedback. In turn, it allows for such feedback to be taken into account immediately. Thus, failure and success are dealt with on the spot. The form of such feedback must not remind the learner that this is a learning task, however, lest flow will never happen.
- “Flow” demands a high level of concentration (engagement) on a limited field of consciousness, known as “hyperfocus”. Conversely, it allows such phenomenon. Subjects can be completely oblivious to the world around them.
- “Flow” can cause the subject to lose his sense of self, and in particular to lose track of physical needs (such as food, drink, sleep or visiting the lavatories).
- The phenomenon can dramatically alter the perception of time.
- Subjects often feel empowered. They have a sensation of being in control, of having been in a situation which was in hand, even though challenging.

Not all of the criteria above are necessary for flow to happen. Indeed, while the three/four first ones seem to describe conditions required for the phenomenon to happen, the four/five latter ones seem to describe what it allows (Csikszentmihalyi et.al., 2005). For such a state of consciousness to happen in a teaching/learning situation, a few conditions are required:

- First, a game for learning must be contextualized (Nicholson, 2012). As Van Eck (2006, p. 18) has written : “Learning that occurs in meaningful and relevant contexts is more effective than learning that occurs outside of those contexts, as is the case with most formal instruction. Researchers refer to this principle as situated cognition and have demonstrated its effectiveness in many studies over the last fifteen years”.
- Secondly, for a learning game to be efficient, it must take into account the learners’ profiles, as well as the context in which they will be working (Deterding, 2011).
- Lastly, the choices which the player/learner makes must be real choices. In other words these choices must have notable effects on the game/scenario, and must be credible. Ideally, there should always be several acceptable ways of achieving the task at hand (the macro-task set by the instructor), and learners should be allowed to choose their own strategy (the micro-tasks to accomplish) to attain the goal (Ferreira, 2014). This will increase their level of engagement, and make the scenario more meaningful by clarifying its objectives in terms of learning outcomes (Rose & Meyer 2002).

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The question of motivation

Nicholls (1984) has posited that self-esteem stems from the perception of one's competence. Judgment on oneself derives from the amount of effort a learner puts in the task assigned by the teacher. Thus, in some situations, and in particular if the learner anticipates failure, he/she may be tempted to provide little or no efforts: indeed to preserve self-esteem, a person will prefer to fail in a situation in which he/she did not try hard. As a consequence, when knowledge is hard to acquire (and in particular if the subject is new to a particular domain), learners may minimize their efforts, to preserve self-esteem, should they meet failure (Fenouillet, 2011, p. 37). It is thus important to design learning scenarios which cannot fail (or at least not fail badly), which in turn will have consequences on the implementation of the roleplays used in class (see below).

In the bridge simulator

Description

For reasons of cost (relating to the price of running, maintaining, or indeed repairing ships, in case of a mishap), as well as for ethical reasons (the safety of both learners and instructors), the French naval academy does not wish to train midshipmen solely onboard real vessels. Midshipmen are therefore trained in part on full-mission bridge simulators, before embarking on real ships, at sea. Thus they can safely try their hand at navigation or ship handling in an environment where mistakes, mishaps, errors or lack of judgement have no financial consequences, no other penalty than a bad mark, and cause no risk to their life or that of their shipmates or instructors.

The French naval academy has four full-mission bridge simulators (Figure 1), interconnected over the school's network, which allows midshipmen to interact as if they were on four ships navigating in the same waters. A bridge simulator is a large room, kept in relative darkness, in the middle of which is a full-size copy of a vessel's bridge, with all the instruments that one would find in a real bridge (such as equipment for communications, radars, plotting aids, and all the buttons, control panels and joysticks used for ship handling). All around the bridge, on the outside of the window panes, at a distance of four or five meters is a large panoramic 360-degree screen. As the screen is seen through the windows and it is some distance away, it fills the entire visual field of users, so that it genuinely looks like one is onboard a real ship at sea. What is more, the 3D image which is projected is coherent with the physics of the vessel as she moves through the water, the physics of the sea and the weather effects, so that the users' brains

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are fooled into believing they are really onboard a ship, to such a point that first-time users often experience sea sickness, despite the fact that the motion is only apparent.



Figure 1- a bridge simulator, at Ecole Navale (credits: © Marine Nationale, 2014)

This type of equipment has long been used to train learners in ship handling, navigation, close-quarter situations, COLREGS (Collision Regulations) and collision avoidance, as well as tactics (for military personnel). A few years ago, they were introduced in the SMCP (Standard Marine Communication Phrases) English courses as well, to implement realistic roleplay scenarios in real time during which the learners must operate communication equipment (such as VHF radios) together with appropriate language resources in order to interact with coastal stations and/or other vessels, military or civilian, while accomplishing the real-time tasks required to safely steer the ship, for example through the congested waters of a busy port. In so doing, the perspective is resolutely to aim at task-based action-driven learning.

A brief review of the literature

Although the topic of the use of bridge simulators in Maritime Education and Training (MET) has been dealt with in a (small) number of peer-reviewed papers, fewer yet have dealt with such use in Maritime English (ME) classes. We have found no instance of a theoretical framework specific to the teaching of Maritime English or of the SMCP. What we have found deals with MET in general and human factors in particular (Crew Resource Management, Situational

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Awareness, bridge communication, intercultural issues). Hanzu-Pazara et al. (2008) indicate that simulator-based training was introduced (in the 1950s) with the primary intent to train learners in navigation skills (such as passage planning), as well as non-technical human factors (such as the pilot/Master relationship). Today, all kinds of simulators are used in all subjects of MET, from engine control to bridge operations, to cargo handling, to interactions with Vessel Traffic Services (VTS). What is more, the use of simulators in MET is regulated in the Standards of Training Certification and Watchkeeping (STCW) Convention which provides specific recommendations for the use of simulators in MET, and for performance-based assessment in competency tests (under sections A-I/6 and A-I/12).

Sellberg (2017) reviewed 34 peer-reviewed papers dealing with simulators in bridge operations training and assessment, published between 2000 and 2016. Of those, only 6 dealt with questions of education specifically. She found that:

“Maritime professionals are most often positive towards simulators in training, yet remain concerned about (...) the upgrades of the IMO and STCW conventions and the practical impact it will have on MET. (...) The conventions stress that simulators should be used for training and certification of proficiency and non-technical skills. This in turn raises a number of questions (...), most commonly, if simulator-based training works in terms of improving safety at sea (...).”

Pekcan et al., (2005, quoted in Sellberg, 2017) raise questions of a more didactic nature: how do we ensure non-technical skill transfer? How can these skills be effectively assessed on both individual and group level? Which cultural factors need to be identified and taken into account during curricular design and during training? Also, Ali (2008) and Hanzu-Pazara et al. (2010) note that simulator training is often poorly implemented, and call for better trained instructors and more advanced technologies to meet the demands put forth in the Manila amendments of 2010.

Several papers address the question of the relationship between simulator fidelity and the quality and transferability of learning. As Sellberg (2017) indicates, the prevailing idea in most domains that use simulators in training is that if the simulation is close to the real-world task, the more likely it is that skills transfer from one context to another. Yet, John et al. (2016) showed that “low-fi” bridge simulation can do at least as well (and sometimes better) as full-mission bridge simulation when it comes to promoting best practices in internal bridge team communication, and Dalström et al. (2009) concluded that low-fidelity simulators allow repeated training for unanticipated and escalating situations which often trumps the benefits of

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sessions which follow rehearsed roles and procedures, as they are often implemented in high-fidelity simulators.

Saus et al. (2010) contend that it is paramount to design training scenarios that enable learners to perceive the simulation as a *realistic* training event, while being well-adjusted to their level of competence in order for them to benefit from the learning experience.

Chauvin et al. (2009), compared learners trained on-board with learners trained in a simulator and found that those in the on-board program showed significantly better results than the simulator-based training group. This should be taken into account, particularly when considering recent proposals to equate simulator time with onboard training time in MET (Barsan, 2004).

Lastly, Kobayashi (2005) investigated the question of the suitability of simulators for assessing competences involved in safe navigation, and came to the conclusion that simulators are well-suited for both training and assessing such competencies, but only if and when they are properly used, which is often not the case. Indeed, Emad and Roth (2008) have warned that not only the learning objectives may not be fulfilled, but the current assessment system of many MET institutions may have changed the learning objectives of simulator-based training itself: instead of aiming to acquire skills and knowledge required to exert their duties onboard, learners may be training to pass competency tests! Similarly, Sampson et al. (2011) found that MET instructors often do not know how to assess such competencies in a simulator, which is not surprising since, as Sellberg (2017) indicates: “it is far from evident how to conduct assessment based on observation of actions in the simulated environment (...). Consequently, more studies are needed in order to provide guidelines for simulator-based assessments of competency to ensure validity and reliability of the assessment methods or models”.

Implementation and set up

A training session at the bridge simulator is called a “watch”. A watch is a period of duty, which typically lasts four hours at sea. However, for reasons of organization, at school a watch lasts no more than two hours. For learners, a watch will consist of a series of interactions between their vessel and other ships or boats around them (which will be played by the instructors in the control room and/or by other midshipmen in another bridge simulator) and coastal stations (such as signal stations, maritime rescue coordination centers, VTS operators, port control authorities, harbormasters, or pilot stations), in a scenario designed by the instructors. In the control room, there are technical operators responsible for the movements of the scenario’s vessels and aircraft, for causing breakdowns and malfunctions to the learners’

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vessels' equipment (such as GPS, radar, rudder or steering engine, etc.), and for adjusting the sea and weather conditions (as per the scenario). There are also language instructors, in charge of impersonating the mariners on surrounding vessels, as well as land stations (over the radio). Scenarios may include events such as collisions, priority (safety) formatted messages to warn others of a danger such as drifting containers or wood logs, or participation to a rescue operation (distress or urgency). They may include missions such as patrolling fisheries and ship interrogation, police operations, but also routine conversations such as a request for pilotage, collision avoidance in a busy fairway, preparation of berthing or getting underway, towing, providing shipping forecast information to a boater, etc. Lastly, let us mention that a language instructor is generally present on each bridge, with the function of assisting learners in real time, as we shall see below.

Analysis

The most important element of a simulation or live-action roleplay is the pedagogical scenario, as it is what guarantees the time-effectiveness and profitability of the exercise, as well as the learners' engagement. This implies that the scenario must be designed (and indeed set up) in advance with the technical and subject matter experts, to place physical objects (such as containers, wood logs, other ships, men overboard, sailing boats involved in a regatta, inbound and outbound commercial traffic) in a position that ensures the scenario remains realistic and coherent. One cannot simply make a ship "appear" on the screen, within detection range, if it was not visible on the radar before, or "teleport" objects to a given position, as this would break the "flow". If the instructors were to say something such as "ok, let's pretend this ship was there since the beginning, all right?", this would make the simulation unrealistic, making it a mere game, leaving out the "serious" part, which would completely annihilate the learners' engagement. Therefore, it is important to seek the expertise of experienced seafarers, for example to place objects and interactions within reasonable and realistic distances, to set coherent speeds, etc. Similarly, you need a coherent "cover story" to make tasks authentic and believable. For example, if a signal station asks the learners' ship to interrogate a vessel in her vicinity, there needs to be a valid reason for them (the signal station) not to do it themselves (such as a technical issue with the ship's radio preventing her to reach the land station).

As we have seen, perceived realism is increased when learners are able to set the tasks to accomplish themselves. One of the main flaws with action-oriented task-based scenarios is that those choices are often made arbitrarily by the teacher: "first you'll do this, then you'll do that" (Nissen, 2011). In a coherent simulation, the situation should determine the nature and order of

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the sub-tasks accomplished by the learners (*ibid.*), which will increase their sensation of control and empower them (Zimmerman, 1990; Eisen, 1994; Gibson, 1991:359), making them more engaged.

Similarly, to increase the perceived realism we have introduced cognitive “noise” in our scenarios. Previously, the only conversations that were broadcast on the VHF were those between the learners and the other “characters” of the scenarios. 100% of the broadcasts were “useful” to the scenarios. This was unrealistic, because VHF channels are public, and the contact channel (16) is the same for everybody. Therefore, we now broadcast “clutter”, i.e. transmissions that can be heard by the learners, but are not destined to them (such as conversations between another ship and a port, or a safety message about a hazard located close enough to be heard, but too far to be relevant to them, etc.). Thus, like in real life, learners must pay attention to everything, but only respond or take into account a fraction of what is broadcast, which is much more realistic, and allows us to revise or test a much broader range of vocabulary.

What is more, SMCP is a standardized language, designed for non-native speakers. Therefore, in some of our scenarios, we have now added exotic accents (Italian, Russian, Asian, Hispanic, Arabic) on top of the more classic British and American ones. Our learners are indeed more likely to be deployed off the Somali, Indian or Omani shores than off California or Wales.

Another noteworthy aspect of simulations is the following: while it is easy to include a digital “assistant” or scripted learning agent (in charge of assisting the learner) when designing a piece of learning software, this is not so easy in a bridge simulator. As a consequence, we have found no other solution than to have a teacher present in the bridge simulator, with the learners, in order to help them in situations where they would otherwise be prevented to carry on with the simulation. Indeed, a live action roleplay in a bridge simulator being a learning activity, it would not serve any purpose to have students fail. Bridge-side teachers are thus to let learners try to solve situations themselves, but to assist them if they feel learners are cornered in a problematic situation which cannot be solved without teacher assistance. In doing thus, they act as a teaching agent (Hubbard, 1999, 2000, quoted in Bertin, 2003):

- they are a reassuring physical presence,
- they are held as experts in the studied subject,
- they are able to provide tailor-suited assistance to each learner.

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Similarly, some of the poorly-mastered content could be de facto validated by imperfect practice which, although wrong, would reach the desired objective, in part because the teacher (because he designed the scenario for the roleplay with a specific pedagogical intention) knows what the learner is aiming to accomplish, and in part because they often share a common L1 and act in an also common L2. Even if this phenomenon also exists in real life (because SMCP is a standardized professional language, aimed at professional communication tasks), it is important for the instructor present on the bridge to be aware of such a phenomenon, in order to correct (a posteriori) any poorly worded sentence which would nonetheless have succeeded, lest they are consolidated by such faulty practice.

Conclusion

As Demaizière and Grosbois have written:

“Digital tools have greatly facilitated the implementation of the task-based approach, understood as co-action, which has thus become closer to real-life social practices.”
(Demaizière and Grosbois, 2014).

We have conducted a survey of various types of learner populations (from young first year midshipmen with no sea-going experience, to seasoned mariners with 15 years of service), and the majority thinks that the added value of live action roleplay in a bridge simulator lies on the fact that it is both real-time and penalty-free. We have, indeed simulated VHF conversations for many years (in specially-equipped rooms, in language labs or simply with the use of walkie-talkies), but learners then have more time to think about their communication, for two reasons: first, because 100% of their cognitive power is then devoted to that (they are not steering a ship), and second, because there is no time constraint (unlike there is on a vessel which is moving close to other ships). Moreover, a bridge simulator allows training in an environment that is closer to that of real life (poor sound, interference, accents).

Yet, to us, the most important benefit of using a bridge simulator is that the skills learnt have meaning: situated practice allows learners to understand why a particular detail has importance, why a wording is better or safer than another one. In real-time situated practice, learners experience the importance of being intelligible.

Still, there are, of course limitations to the use of bridge simulators. First, it would not make sense to teach all VHF classes in a simulator, because they only become cost- and time-effective when a significant amount of knowledge has been acquired, and sufficiently practiced (in

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language-learning tasks focusing on the form) to be nonetheless mastered despite the added constraint of real-time action, and available to learners despite the cognitive load caused by the use of the bridge simulator, to accomplish complex communication tasks (focusing on the goal, instead of the form). If the simulation had to be stopped to correct mistakes and make up for missing knowledge, it would get in the way of the benefits of real-time simulation.

Also worthy of interest, is the fact that the only learner who is handling the communications is really active during the exercise (while the helmsman, or lee helmsman remain fairly passive). This is why we ask that learners rotate through all functions every 20 or 30 minutes. While this allows us to extend the benefit of such practice to more students, it undeniably does get in the way of realism. We have, to date, no solution to propose to this problem.

To conclude, as our review of literature has shown, the benefits of using a bridge simulator for SMCP practice seem real, and for that reason, they are likely to remain a part of the training of Officers of the Watch, within the French Navy. Still, more empirical data on simulator-based training is needed, and in particular when it comes to the specific question of Maritime English in general and the SMCP in particular. No doubt a topic for further research.

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