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THE MARITIME ENGLISH MOOC: USING THE MOOC TECHNOLOGY TO FLIP THE CLASSROOM

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Abstract: In today's time of economic constraints, class hours are being cut in many MET institutions and academic staff is required to bring students to at least the same results as they used to, but in fewer hours of class. Despite these facts, we have chosen to spend some class time in individual oral examination of officers of the watch, because we felt that if the students' capacity to actually "do the job" was never assessed in simulated communications, their certification would have no value. The solution we proposed relies on the principles of MOOCs (Massive Online Open Courses) to "flip" the classroom, moving lessons and the transmissive part of the training *out* of the classroom, so that more practice time was made available *in* class. This article will first describe the organization of the course, and then explain how (and with which digital tools) it was implemented. A final part will try to assess the efficiency of the new course in comparison with its previous form.

Keywords: MOOC, SPOC, flipped classroom, IT, online course, *Moodle*, e-learning

1. Introduction

The foundational maritime English course offered to first year French Navy cadets at *École Navale* is a twenty-hour module. It is an introductory course aimed at teaching basic VHF communication to true beginners, i.e. learners who know nothing at all about it. The course's objective is to allow the students to be able to understand and participate in a conversation with another vessel or shore-based station, over the VHF. Of course, a prerequisite is to allow the students to learn first the basics of maritime English in general and SMCP in particular. This



includes namely basic lexical items covering themes such as the harbor and harbor facilities, harbor personnel, ship types, ship parts, buoys and seamarks, direction, position and movement, the weather and shipping forecast, etc.

To cover this material, the teaching staff at *École Navale* has created several job-specific booklets over the years. These are built around exercise-based chapters, organized in a dozen themes. Since the question of general language is dealt with in other courses, these booklets do not focus on grammar *per se* (tenses, modals, plural, adjectives, etc.). Instead, the Maritime English Basics course is really an ESP course, with an aim to teach only job-specific vocabulary and procedure (i.e. standardized syntax), as well as maritime “culture”, i.e. information about the Navy and its missions, safety at sea, etc. In other words, first year navy cadets learn simultaneously what an LHD¹ is and the word for it in English; they learn what a relative bearing is, and how to say it in English; they learn that whenever someone finishes a sentence over VHF, they mark that with a specific procedure word, and they learn *what* that word is in English.

It is important to mention that being a naval academy (military), it is very unlikely that our cadets ever have to communicate with their crew in English (simply because only French citizens can legally join the French Navy). Intra-ship communication is therefore *de facto* excluded from our syllabus. The main focus of the Maritime English Basics course is thus on VHF communications, (both ship-to-ship and ship-to-shore), with an exception for conversations with a pilot or another mariner during a boarding inspection.

In the past, it took about 8 to 10 hours of class to allow the students to learn vocabulary basics, in order to prepare them for the core of the course, which is the study of the “VHF” chapter (through a mix of lectures/slideshows, listening, reading, writing and speaking classroom tasks, done by the students and corrected in class with a teacher). The “VHF” chapter includes many listening comprehension exercises (based on audio tracks), as well as speaking activities (typically in the form of pair work, simulation and role-play). It covers both VHF basics (prowords, procedure, international alphabet, interrogation of a vessel, etc.), and priority messages (distress, urgency and safety communications). After completing that material, students move on to more complex routine conversations such as pilotage, berthing and mooring, getting underway, etc., as well as navy-specific scenarios (such as law enforcement, drug interdiction or anti-piracy operations), again mainly through examples of such communications (listening) and practice (role-play).

¹ LHD : Landing Helicopter Dock. A multipurpose amphibious assault ship capable of operating helicopters and fitted with a well deck.



Because of the time constraints, it was never possible to fit in an oral practice examination at the end of the course. Students did two hours of test (one hour of listening comprehension and one hour of reading/writing) which proved their knowledge of the vocabulary and procedure. However, we felt something was missing: we did not allow them to prove their capacity to actually “do the job” in an exam through the well-adapted use of the knowledge acquired during the course. What is more, we felt that, given the time spent of vocabulary basics, we did not have enough class hours to instruct and train the cadets properly for them to pass such an exam. After a thorough examination of the course’s material, we concluded we needed to make a few extra hours available in order to 1) increase the amount of practice and 2) test each student’s individual capacity to summon their knowledge and use it in a real-life situation.

The first part of this paper will explain the solution we adopted, and the pedagogical choices we made, as well as describe the organization of the course. The second part will explain how, and with which digital tools we implemented the course. A final part will try to assess the results we obtained, and point out the benefits we gained, while mentioning the constraints involved.

2. Why we chose a SPOC

2.1. Flipped classrooms

The solution we decided to implement uses the MOOC² technology. However, our course was neither “massive” (30 students), nor “open”. It was a SPOC (small private online course). SPOCs support a current trend in education known as “blended learning”, “hybrid learning”, or “flipped classroom”. The rationale is to combine the glitz and flexibility of online resources and technology with the personal engagement between faculty and students that in-classroom teaching provides [5], [10]. In a SPOC, students typically access lectures and accompanying interactive quizzes on their own time, at their own pace. When they believe they have achieved well enough, they move on to the next chapter. However, knowledge without practice is information, not training [7]. Therefore, practice is done in class, with the group, overseen by the teacher. It

² MOOC: Massive Open Online Course. A MOOC is an online course designed to be simultaneously run for a large amount of students (several thousand). It is typically built on a Web 2.0 site, where course material is made available at a scheduled pace (a MOOC is a social event whereby all participants learn together, at the same time, not just a repository of online material). Typical course material includes videos and online quizzes. C-MOOCs (connectivist) also add group work, through extensive use of forums and peer assessment, while X-MOOCs (Expert/Extended) are usually limited to the “video + quiz” format. Major MOOC platforms include Coursera, Udacity, EdX and Khan Academy.



generally relies on the principles of task-based learning, and much of it is conducted with actual VHF radios in hand.

Early research results have shown improved learning and student outcomes using this blended model [6], [11], [13]. The literature also shows that much of the satisfaction and success of blended learning experiences can be attributed to the interactive capabilities of Internet communication technology [4], [12]. Most importantly, using the MOOC/SPOC technology allows teaching staff to use their time with students in different ways, such as allowing for more practice and hands-on work. Most students will appreciate flipped classrooms because they would rather have the teacher's assistance when they are engaged in more challenging tasks than when they are learning the basics [8].

We decided to start the course six weeks before our first meeting with the cadets. Our plan was to use our LMS³ platform (*Moodle*) to make course material available online, at a controlled pace. Thus we would be able to monitor each student's activity, and apply corrective measures if need be. We decided we would shoot a number of short video snippets covering the material for each chapter, voluntarily limiting their length to less than 10 minutes (so as to allow learners to watch and re-watch them at any convenient moment for them, including lunch breaks or bus and ferry transits). We would also limit their content to only one or two themes. Secondly, we would design interactive quizzes that would provide immediate feedback for the learners, letting them know how well they were learning, and giving them a sense of achievement (thus keeping their motivation high), while allowing the faculty to monitor students' progress. Thirdly, we would create self-study aids (rapid-learning tools), to allow the students to learn the material, and fourthly, we would gamify⁴ the course, to boost their motivation, through the use of badges, scores, and a reward [3].

2.2. The course's schedule

The course was experimented first on a mixed target audience of Customs officers, Coastguards, and Contract officers. It was scheduled to be run (in-class) over six weeks. However, there were only three weeks of class for each population, alternating with deployments at sea (Fig. 1). Our

³ LMS: Learning Management System. An LMS is a web 2.0 (collaborative) site designed for the delivery, administration, documentation, tracking, and reporting of online education courses or training programs. The most famous ones include *Blackboard*, *Moodle*, and *Desire2Learn*.

⁴ Gamification is the addition of gaming elements (scorification, for example) to non-game activities. It is a means to increase learners' engagement. See [9].



analysis of the syllabus led us to identify five chapters which could be dealt with outside of class.

These were:

- Maritime environment basics
- Ship types
- Ship parts
- Directions, positions and movement
- The weather, and shipping forecasts

We wanted to implement a flexible schedule of classes (in which each chapter would partially overlap with the previous and next chapter), for ease of use. Thus, cadets would have more time to cover the material assigned for any given week, according to the schedule set forth in Fig.1.

Fig. 1: Schedule of the course

Week	Week	Week	Week	Week	Week	Week	Week	Week	Week	Week	Week
1	2	3	4	5	6	7	8	9	10	11	12
Chapter 1											
		Chapter 2									
				Chapter 3							
						Chapter 4					
								Chapter 5			
Distance learning						In-class learning					
						Classes (group 1) (group 2 at sea)	Classes (group 2) (group 1 at sea)	Classes (all)	Classes (all)	Tests	Bridge simulator

The first chapter was to open in week 1, and to be available for completion online during two weeks. The second chapter, in turn, would appear online in week 2, and remain available for completion for two weeks, and so on, and so forth. We chose not to put all the material online as soon as the online course started, because we did not want students to rush into completing it, and then forget it before in-class work began. Moreover, we believe that maintaining a common pace favors group dynamics. After the completion of the self-study period, classes were to start (in week 7), beginning directly at the VHF chapter. There were 8 hours of class in week 7 or 8 (depending on the group) and 8 more over weeks 9 and 10 for everyone. Assessment was to take place in week 11, and threefold:

- 1 online quiz (1/3 of mark)
- 1 listening test, in class (1/3 of mark)
- 1 oral test (individual, 2 exercises; 1/3 of mark)



Finally, a bridge simulator session was added as an extra practice session, in week 12, after the final assessment (because we were not able to schedule it sooner).

3. Implementation

3.1. Digital tools

For cost reasons, we needed to implement the course using only free or very cheap pieces of software. Since *Moodle* is deployed at *École Navale*, we decided we would rely on it. We created a page for the course (Fig.2), on which we explained what the learning objectives were, and how the course would be organized.

Fig. 2: The Moodle page of the course

Presentation of the course

This course is an introductory maritime English course. It was designed with the STCW (Standards of Training and Certification for Watchkeeping) in mind.

Requirements: Anyone will benefit from following this course, but EML1 is required for you to really make significant progress.

Learning objectives: at the end of the course, you will be capable of:

- understanding day-to-day conversations in a professional maritime and naval context,
- describing most ships, ship parts and equipment on board various types of vessels,
- understanding weather forecasts, supplying weather information to another ship,
- understanding and answering to routine VHF communications,
- understanding and answering to distress (MAYDAY), urgency (PAN PAN) and safety (SECURITE) messages,
- standing a watch in a warship's bridge with the assistance of a foreign pilot while understanding engine and helm orders,
- making pilot arrangements and berthing arrangements with foreign harbor control authorities.

Organization of the course: The first part of the course was designed as a MOOC, in order to be easily used as a self-study tool. It is composed of online material (videos, exercises and other activities) and assessed through automated quizzes.

The second part of the course will focus on VHF communications. You will learn about "prowords", formatted messages, and routine messages. You will of course practice a lot, both listening to and speaking on the VHF.

Please, bear in mind that this course is a language course and is no substitute for a GMDSS course.

● Open all ● Close all

Instructions: Clicking on the section name will show / hide the section.

1 ● **Maritime English basics - Toggle** Topic 1

This section of the course was designed as a MOOC (or rather as a SPOC, a Small Private Online Course). Watch the videos, and do the activities.

Each quiz will be available for a limited time only, and will be visible only once you have completed the viewing of the learning material provided. However, **you can try each quiz as many times as you want**, and only the best attempt will be retained.

IMPORTANT NOTES :

- 1- Every week, there will be a new chapter available, even though you have two weeks to complete each chapter (they overlap).
- 2- If you complete the course with 80% or more, you will get access to a **free** download of *Neptune*, the Maritime English software!

Upcoming events

There are no upcoming events

[Go to calendar...](#)

[New event...](#)

Progress Bar

Progress: 100%

Mouse over block for info.

[Overview of students](#)

My latest badges

Maritime English Basics

We added three blocks to the page, in order to maximize learners' engagement:

- A *Calendar* block: we added group events for the beginning of each chapter, for the deadline of each chapter's quizzes, for each face-to-face class, for the exams, and for the



bridge simulator sessions. Thus, each student connecting to the course's page would be informed of upcoming events and deadlines⁵.

- A *Progress Bar* block: this is not a standard *Moodle* component, but may be downloaded from the internet⁶. It allows the teacher to choose activities and resources within a *Moodle* course that he/she wants to monitor⁷. Once this is done, each student will see a graphic representation of his/her progress in the form of a bar made up of one block for each monitored resource (Fig.2, middle-right), as well as a score (in percentage). Each block will appear in blue when not viewed (if it is a video) or not passed (if it is a quiz), in red if not done and it has a deadline (which will be displayed upon hovering), and in green if viewed or passed. Moreover, teachers also have access to an “overview of students” button, which allows them to monitor the progress of a class or group (Fig.3).
- A *Badges* block: *Moodle* allows instructors to award achievement badges⁸. Hence, a student's achievements are rewarded, and he/she may display the badges he/she earns in his/her profile page. Our population being military, we designed a badge which looks like a military medal, and informed students that they would earn the badge upon completion of the course (Fig.2, bottom-right). Badges have been proven to increase students' motivation and engagement in learning, both individually and collectively [1], [2].

To boost students' motivation, we informed them that they would be able to download a free version of N.E.P.T.U.N.E, the maritime English software we have created, upon completion of the course with a score of 80% or more for each quiz.

Figure 3: The Progress Bar block / overview of students (partial)



⁵ On Fig.2 (top-right) nothing appears in the Calendar block because the snapshot was taken after the completion of the course. When the course is running, upcoming events are listed there.

⁶ https://moodle.org/plugins/view.php?plugin=block_progress

⁷ A video presenting the Progress Bar block is available at <http://youtu.be/06LA5Cv9Fhw>.

⁸ For more information on badges in general and Open Badges in particular, see <http://openbadges.org/faq/>

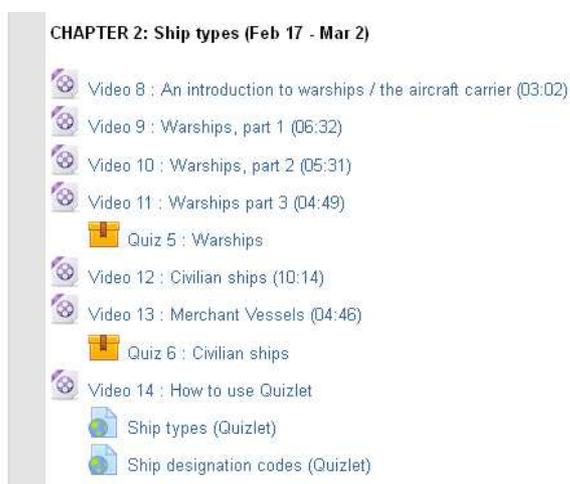


An initial video gave learners a tour of the *Moodle* course, explaining how it was organized, and how to interact with it. A direct link to that video was sent to all students in the introductory message of the course.

3.2. The chapters

The online course was organized in five chapters. Each chapter contained a number of videos as well as the related quizzes and rapid learning activities (such as flashcards and interactive exercises). Next to each video, its duration (in minutes and seconds) was mentioned (Fig.4). Each video lasting between three and eleven minutes, this motivated learners to watch them several times. If video lessons were longer, learners would wait until a large chunk of time is available to begin watching one. This implies that during the planning and design of the course's material, it must be the faculty's concern to create *short* videos. Also, it is worth noting that each chapter was designed to include no more than 30 minutes of video and 30 minutes of quizzes, so it could easily be covered in one week despite the midshipmen's busy schedule.

Fig. 4: A typical chapter, on the *Moodle* page of the course



Flashcards and other rapid learning activities were created using *Quizlet*⁹. For the videos, we made “screencasts”¹⁰ of commented *PowerPoint*TM slideshows and *Prezi*TM

⁹ <http://quizlet.com>. All *Quizlet* activities created by the author for the course are free to use, and are gathered at <http://quizlet.com/class/862646/>.

¹⁰ A “screencast” is a capture of one’s screen and audio input in video format. Thus, one may run a slideshow while commenting upon it, creating a film. The software used to capture the “screencasts” is available at <http://screencast-o-matic.com>. It is programmed in JavaTM, and thus portable on most operating systems. The “full” version costs 15 Euros per year and includes screen annotation tools, while a “light edition” is available for free.



presentations¹¹. The 3D illustrations were designed using *SketchUp*^{TM12} a free, user-friendly 3D-modelling piece of software produced by Google.

Fig. 5: A Quizlet activity (quizlet.com)

Quizlet

Cards Learn Speller Test Scatter Race

Back to Maritime English : Directions and positions

Remaining: 0

Incorrect: 0

Correct: 15

Start Over

Options: See Term first, Speak text

Round 1 15/15 - 100% Start Over

1. topside → above (on a ship)
2. on port side → on the left hand side of the ship
3. on starboard bow → ahead of the ship and on the right
4. on port bow → ahead of the ship and on the left
5. Aft → behind (on a ship)
6. abeam → on the side of the ship
7. aft → In the general direction of the stern
8. on port quarter → behind the ship and on the left
9. below → under (on a ship)
10. amidships → in the middle of the ship
11. dead ahead → exactly ahead
12. aloft → up in the rigging
13. on starboard side → on the right hand side of the ship
14. on starboard quarter → behind the ship and on the right
15. astern → behind a ship (in the water)

The feedback quizzes were created using *Free Quiz Maker*^{TM13}. This application allows the easy creation of SCORM-compliant packages. This means that, even though the quizzes can include video, audio or picture elements, the software wraps all necessary files into a single .zip archive, which one simply adds to the *Moodle* page of the course as a SCORM package. What is more, it also means that the information regarding the learners' activity (number of attempts, time spent on each quiz, responses given, scores) are extracted seamlessly into any SCORM-compliant LMS. In other words, once a quiz is online, the teacher can monitor the students' progress, and material can be made available (automatically) based on each individual student's achievements! For example, the instructor may decide that only students who achieve 80% or more in a given quiz may have access to the following chapter.

¹¹ *Prezi* (<http://www.prezi.com>) is a dynamic presentation web application. It does not have all the animation functionalities of *PowerPoint*TM, but is much easier to use, and the presentations created are a lot more dynamic. Instead of slide shows, they allow for the creation of documents in which information is placed in a spatially coherent way, somehow mimicking a mind map.

¹² Available at <http://www.sketchup.com>.

¹³ The free edition of the application is available from <http://www.ispringsolutions.com/free-quiz-maker>.



4. Benefits... and constraints

4.1. Benefits

The online course was a success. Almost all learners completed 100% of the SPOC before the first face-to-face class, as expected. This means that each of them watched each video at least once (and sometimes many times more!) and passed each quiz with 80% of correct answers or more. The only student who did not manage to complete the course was a foreign student from Africa whose main problem (beyond a low general English level) was computer literacy. However, the *Progress Bar* tool allowed us to detect this by the end of week 1, and we were able to apply remedial measures¹⁴.

The online part of the final test was created using *Moodle's Quiz* and *Question Bank* features¹⁵. We created eighty questions, in 12 categories. To make the creation of meaningful questions easier, we added the *TinyMCE*¹⁶ module to *Moodle*. Then we created a framework for individual randomly generated tests which would draw 50 random questions from the question bank, while drawing the same number of questions from each category for each test. Thus, each student took a different, although equivalent, test. We allowed two attempts, and informed the students that the best attempt would be retained. The reason for that choice is that this was in fact a ruse to encourage them to study, before the final in-class test (more difficult).

As planned, we were able to spend a lot more of class time (almost three times as much) on pair work and simulated conversations, thus allowing learners to practice a lot more.

The in-class test results were excellent and, more importantly, the orals were beyond our expectations. All students passed the oral exam, including the foreign student whom we had worried about. He did not, however, pass the written exam. When we took the group to the bridge simulator, at the end of the course, they did very well, despite the added stress of real-time movement and watchkeeping.

¹⁴ We printed paper-based material and gave the student individual support in the form of one-on-one lessons so as to help him achieve the course's objectives. We were forced to give this student private tuition (outside of class) also during the VHF chapter.

¹⁵ A video tutorial on how to create questions within a question bank, and how to use them in a *Moodle* quiz is available at <https://www.youtube.com/watch?v=dNVTrD5O1qc>

¹⁶ *TinyMCE* Cloze Editor is a *Moodle* add-on which facilitates the creation of cloze-type questions. It allows the easy (thanks to a WYSIWYG tool) creation of open questions, and the creation of lists of correct variants for each response. Available at https://moodle.org/plugins/view.php?plugin=tinymce_clozeeditor



Fig. 6: Moodle's Grades feature

Surname	First name	Quiz 1: Parts of a harbor	Quiz 2: Harbor Personnel	Quiz 3: Traffic Separation...	Quiz 4: A ship can be	Quiz 5: Warships	Quiz 6: Civilian ships
Aurélien		100.00	100.00	100.00	100.00	100.00	100.00
Liza		100.00	100.00	100.00	82.35	100.00	90.00
Hervé		92.31	100.00	100.00	100.00	100.00	95.00
Mehdi		84.62	85.71	86.67	94.12	100.00	90.00
Pierre		100.00	100.00	80.00	88.24	90.00	85.00
Cyrille		92.31	100.00	100.00	94.12	93.33	100.00
Cyril		100.00	100.00	100.00	100.00	100.00	100.00
Florent		100.00	100.00	100.00	100.00	93.33	95.00

As we have said, since all quizzes are SCORM-compliant, the student's results were automatically available for us to see in *Moodle's Grades* feature (Fig.6). This served two purposes:

- It allowed us to monitor each student's individual progress,
- It allowed us to see that on average, all students did worse on the weather and shipping forecast quizzes than on all other quizzes. This permitted remedial measures during the in-class sessions.

4.2. Constraints

However, this was achieved at a cost. First, the amount of work to create the 22 videos, 12 quizzes (over 250 questions), and 6 *Quizlets* for the course was colossal. On average, it takes over one hour of work to create one minute of video. For the 2 hours of video that we created, we estimate the work load to about 60 to 80 hours for each of the two teachers involved in the project, i.e. a total workload of 120 to 160 teacher hours. Not included in this figure are the time spent creating the course itself on *Moodle*, uploading all files, creating the groups, calendar events, monitoring student's progress, etc. Luckily, some of this work is now done, and will not have to be repeated for the next session. However, following students' feedback, many things will be changed in the future, at an extra time cost.

Secondly, we quickly realized that we had to provide the learners with a document in print summarizing the chapters covered in the SPOC, lest they might forget everything they had learnt before the end of the course. In the old version of the course, booklets were filled in during classes, thus guaranteeing that all students would go away with correct information. Since that is no longer true, we therefore printed a teacher version (corrected) of the 5 first chapters of the course's booklet, which we handed to the students on the first day of the face-to-face classes. In



the first four periods of class, we checked with the students, that they had understood all the material in those chapters.

Thirdly, one must be aware that the major issue with online courses is the very high drop-out rate. Most MOOCs face an 80% or 90% drop-out rate, on average. To counter this, we closely monitored students' progress, using the *Progress Bar* tool. As each chapter was scheduled to run over two weeks, we made sure we checked how well students were doing by the end of the first week. Then, we sent a personal message to the 10-15% of students who were lagging behind the group, which was enough to get them back with the class. We also sent a message every week, to announce the availability of new online learning material, so as to keep students' motivation high. In retrospect, this close monitoring and frequent communication with both the group and individual students in difficulty was probably the most important ingredient for the success of the online course.

5. Conclusion

This paper has explained the reasons which motivated us to conduct a SPOC to flip our Maritime English Basics course (making the best of class time, increasing the amount of practice). It has described the pedagogical choices we made and explained which digital tools were used to implement them. It has shown that the results were very satisfactory, while mentioning the constraints involved (time cost; need to monitor students' progress). The author realizes that it does take some computer literacy to implement such a course, but believes that IT in general and MOOCs and the internet in particular are changing the definition of a teacher's job. In the future, it is likely that creating online material officially becomes part of a teacher's job, if not already the case. At *École Navale*, we believe this is an opportunity to conquer new territories, and "boldly go beyond" the limits of known waters.

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