Impact of “smart” technologies in teaching maritime subjects

E Barsan¹, C Varsami², A Duse³, R Hanzu-Pazara⁴ and A Jenaru⁵
¹,²,³,⁴,⁵Constanța Maritime University, Navigation Department,
104 Mircea cel Batran Street, Constanta, Romania

E-mail: anastasia.varsami@yahoo.com

Abstract. Nowadays students were born in a world of continuous evolution of technology. Technology is part of their daily life inside and outside their professional studies. One of the most important discoveries when it comes to technology is the internet which provides today the possibility for students to have access to all types of information and resources which are very useful in their studies activities. Therefore, in our paper we ask a very natural question: which is the place of technology in the university studies? Moreover: What part does technology play in teaching Maritime subjects? And: Which is the impact of technology in maritime teaching?

Our intention is to go into more specific details on this subject, as in trying to exemplify our observations based on our own experience in teaching in Constanta Maritime University. Further on, we intend to discuss how the so called “smart” technologies came into occupying a very important place in the daily activities of our students forcing trainers to cope with this phenomenon in order to improve their teaching activities and even their relation (communication) with their students. We chose to develop this subject because everybody needs to be aware of the huge differences between generations of students. Previous generations used to require and enjoy studying from the traditional paper resources, while present generations do not even visit the libraries anymore. This is why university lecturers need to adapt their teaching methods, teaching tools and study materials to their students’ needs and of course to the evolution of technology.

1. Introduction
The so called “smart” technologies became part of our daily life quite recently if we analyse them within the historical framework of humankind evolution. This is why, at least in Romania, there are still people, mostly older ones, who still don’t know how to use a computer or how to handle a smartphone. At the opposite extremity we find primary and secondary school teachers who choose to send homework and additional tasks or information to their pupils by using e-mails or even the one and only most popular social network all over the world.

Therefore, some natural questions come to our mind: What if parents refuse access to such networks, wanting to protect their children from too much exposure? What if parents do not have the necessary material possibility to provide all this sophisticated “smart” gadgets for their children? and: What if older teachers (lecturers) do not know how to use these “smart” technology?

Trying to answer these questions and so many others related to this subject is going to be our purpose of our analysis along with pros and cons when it comes to the impact of such technologies in our life. Crook considers “smart” to be a “promiscuous” adjective which is “found in a wide variety of relationships” [2]. We actually consider that maybe such technologies which are considered to be
“smart” are meant to make our life easier but sometimes they complicate it more than we would have expected them to. This happens only because we belong to the generations which are part of the transition period, generations familiarized with particular technologies, or lack of technologies, which were taken out of their comfort zone and deal with the situation differently. Some people enjoy progress, others deny it.

2. Smart teaching vs. smart learning

These two concepts [2] we chose to analyse here are naturally related to the education field, both of them being focused on human interaction and collaboration. In the academic field, interactions between teachers and students are the basis of the teaching-learning system. This process is based on exchanging ideas and opinions, resulting in development and progress in the educational methods.

Therefore, communication should make use of the latest techniques and technology dedicated to the educational process. This is why, for a proper collaboration between lecturers and students we consider it necessary to be well aware of the purpose and the part these instruments play for reaching our objectives. In our University, there are several projects designed to improve lecturer’s competencies in accordance with the latest requirements of a high quality maritime learning process. We intend to go into further details in this paper describing the development of training lecturers in using smart teaching and modern technology in order to improve communication and collaboration with students.

As we have previously mentioned we live in time of rapid evolution when many of the classical methods are changed or replaced by “smarter” ones. In the academic field some of the old methods or techniques disappeared, necessity for new being more important than few years ago. This trend has been facilitated by the accelerate development of technology, mainly by the introduction of computers in almost all activities.

Today, the use of computerized programs and virtual simulations are common teaching techniques. All this “smart” technology seems to be the future of the teaching system, which now includes concepts such as: e-learning technologies and distant learning. This is why all training institutions needed to implement the latest techniques before the entire educational system would more in the cyber space.

Having properly trained graduates is the objective of any university, and such an objective depends equally on providing the latest technology and human resources able to use it. Lecturers’ competency to transmit is something acquired in time within a thorough study framework which required improvement and updating along the way.

The concept of “Smart teaching” could be considered a set of skills increasing lecturer’s competencies and providing new ones related to modern technologies. Such skills proved easier to be acquired by young lecturers which consider “smart” technologies as part of their lives. Still, for lecturers who had also the opportunity of working in the so called “old style” it is necessary to implement the change in mentality because it may be easier to use a computer than making someone to understand the process.

Nowadays, we observe a revitalizing process of the teaching system, as younger graduates are interested to start a lecturer career. Many of them are familiar with the subjects and techniques used for teaching which is still not enough for turning them from receivers (performing smart learning) into providers (performing smart teaching). Such change needs attention and support from experienced lecturers and proper communication not only verbally but also by using the “smart” technology available. Still we need to pay attention to the risks of diminishing lecturer-student interaction by using too much of this electronic communication as we do not want our “smart teaching” or their “smart learning” to become just a good reading of different materials or solving of different applications.

Nowadays, most communication is realized, in many cases, by using technology. This is why we observe sad situations in coffee shops for example where a group of five teenagers sit together at the same table but focusing all their attention on their smart phones and not on talking to each other. In
order to attain a proper equilibrium in communication and to achieve the objective of training we need to identify the correct teaching techniques of this system.

In the traditional way of teaching, the connection between teacher and students used to be represented by the face to face interaction and direct transfer of knowledge. In the “smart” way of teaching, the computerized way, face to face interaction is totally missing in many situations. In order to supplant this missing part while providing the same information and reaching the same objectives, it becomes compulsory for the lecturer to know how to apply these smart techniques in order to keep a balanced interaction with students.

3. “Smart” Communication in the maritime academic field
Communication has always been considered the basis of all social developments. In the educational sector it is impossible to deliver knowledge and to develop the professional level of a student without properly mastering communication skills. This is why “smart” communication is considered nowadays to be vital for the teaching and training process representing a huge development which facilitates information transfer. Communicating by using all available technology improves interaction between lecturers and students, most of the time simplifying both the transmission (lecturer) and reception (student) of information.

Along the years, only teachers have been considered to be responsible for the training process. Now, when evolution of “smart” technologies gives access for students to all sorts of informational resources, they are invited to have their own contribution in the process being part of the research and development activities.

“Smart” communication today represents a two-ways process where positive feedback encourages the parties involved to reach out for a higher development while the negative one could be also considered as positive due to the fact that it could have as a consequence the desire of improvement. Both lecturers and student should try to avoid negative remarks which could result in lack of interest for the process.

Besides classic ways of communicating, as in verbally or in writing, we would like to focus on virtual communication as it is based on the newly emerged “smart” technologies. This is not an exclusion relation; quite on the contrary, “smart” technologies facilitate both verbal and written communication bridging any distance due to the fact that there is no need for face to face interaction. “Smart” communication becomes therefore an essential part of the teaching process. Lecturers need to have the necessary skills to use modern systems and in this way receive a positive feedback from their students.

We all remember the times when teachers had their hands dirty all the time from using white chalk to write on black boards and same happened with students when they had to solve practical exercises. There is a huge difference now when we deliver our lectures in power point presentations for example and students are able to send their projects by email to their lecturers. Waste of paper also hugely avoided as not only homework but even final tests may be taken on the computer. We do not need to publish our lectures anymore as we are able to upload them on the virtual campus of our university. Students do not need to take full notes of our explanations as they have the possibility to download lectures form the same virtual campus: http://campus.cmu-edu.eu/.

Computerized and virtual communication tools are not so new anymore, especially in maritime training where simulators have been used along the last decades. Such computerized programs help students in having a close to reality experience as in being on board a ship, on the main bridge, loading or discharging cargo, operating the main engine of the ship etc. In the maritime academics these training tools play an important part due to the necessity of mixing theory and practice especially in those maritime universities which do not have a training ship of their own, such as ours, Constanta Maritime University, where the latest generation simulators help lecturers in guiding students towards their future careers as realistically as possible.

Besides these advantages presented by these programs, there are also some disadvantages, especially regarding costs of such equipment not only for their first acquisition but also for
maintaining them updated. Having the best simulators for example is the pride of any maritime university all over the world, and this is how “smart” technologies gained a vital place in the maritime training process.

Further on, we also need to discuss how computer based training is gradually being replaced by the concepts of e-learning or by the on-line training. These new methods of “smart” communication and training allow real time transfer of information and a direct connection between students and lecturers. Many universities have developed such systems of communication between lecturers and students, especially on-line systems which offer the possibility to provide courses content and teaching materials, to receive students’ opinion about these and to help lecturers to make changes and necessary improvements to their own course materials. Many of these communication systems are created inside the institution on a web portal or as an independent teaching platform: http://campus.e-shipping.ro/.

Constanta Maritime University has developed such a web platform, structured in sections according to each specialization which includes courses for bachelor and master degree. This platform, called virtual campus, has received in time quite a positive feedback proven especially by the huge number of students who access the information posted there. Along with the training information, the platform offers the possibility to communicate with the lecturer or developer of a particular course through an open forum or by sending a personal e-mail, being still open to new ideas which could prove useful in the courses’ development and in solving practical and theoretical applications at some disciplines [5].

4. Use of “smart” teaching techniques in the maritime academic training process
These days, computers and computerized programs are a natural part of life for many people. Computerized technologies are becoming indispensable for many activity fields, computers being part of the production process, or even the essence of the work. Considering all these aspects, it feels only natural for the educational system to become part of the virtual environment as sometimes interacting with our computer at home proves to be easier than personal interaction. Computerized information is perceived as impersonal by the receiver and therefore interpreted and adapted to one’s own perception [6].

A very important advantage of the online learning process is the possibility to access any information anytime, according to the user’s schedule. This option is valuable for those who have a busy life, for example students who already work for a living and for whom the regular teaching schedule is difficult to attend. This flexibility offered by the on-line teaching techniques have a great importance in the maritime field, where the daily program is made according to the local time for students (cadets) who are sometime on board ships, mostly different from the university’s local time [4].

Our University makes use of such “smart” technology for several courses such as the one for familiarization training for oil tanker operation. During this online course, students and already certified seafarers interested to apply for a job on a tanker ship, have the possibility to visualize simulated applications regarding different operations necessary on a tanker ship, having previously read the theoretical modules on the subject. Such courses are proof of how useful smart technology could be in the educational field. Using online training, students have the possibility to access more courses at the same time, options to acquire all information at once and to cover the curricula in a shorter period than usually during regular classes.

New technologies achieved a high grade of interactivity since multiprocessing technology development. A large scale 3D simulators and their interactive usage are now available. On line students are now able to plan what, when, where and for how long they need to learn. Using their input, the e-Learning system organizes the material they will study and the way they will so that based on the previous assessment of their skills and their favourite learning models. In this way roles of lecturers and time necessary will be greatly reduced [2].
Besides all the previous advantages we also need to analyse the flaws of such “smart” educational systems. Even if delivery of testing materials is fairly straightforward, which makes them available to the student anytime, the problem arises when the student is required to solve assignments and testing.

On-line trainers still have difficulties in controlling cheating in quizzes, tests, or examinations because of the lack of control. In a classroom situation a teacher can monitor students and visually uphold a level of integrity, however, with distance education this is not possible. Some educational institutions found a solution for this problem in requiring students to take examinations in a controlled setting. [3]

Today in the training process of the future seagoing officers, modern technologies such as AutoHydro, AutoLoad and Model Maker are used in order to identify the best solution for a ship’s hull design, programs such as Master Load for a correct loading operation of cargo. [7] Specialized programs are used for training in using the correct lights and signals by the ships, to acknowledge the avoidance collision rules and to apply them correctly according with the requested situation. Still the main technology use for specialized deck and engineer officers is represented by simulators such as the ship handling simulator, the engine room simulator, crisis management simulator and liquid cargo simulator.

During their academic training, students have the opportunity to practice on simulators during many specialization courses. These applications help them to improve their skills and to reach the required knowledge level for the future duties. According to the latest university statistics, students who pass a simulator training process have better results in their future activities and they also receive better appreciation from the shipping companies.

Feed-back from shipping companies says that younger officers with duties regarding safety of navigation, trained on simulators more than two years, are able to react faster in over than 40% of the dangerous situations, then their colleagues trained under classical style without simulators training. In the engine department, this percentage is over 60%, due to simulation applications during training and use of computerized programs specialized in the use of engine systems. [1]

Students’ level of skills developed or improved after such training, contributing to an easier access of Romanian cadets and younger officers to the international maritime work force market. Today, our graduates are accepted as equal competitors with other nationality officers and respected for their knowledge and training level.

We also need to mention here the International Maritime Organization requirements with an accent on the level of training in the maritime educational system. Within the latest tendencies of changing all levels of training, in order to improve the STCW Convention, the use of “smart” technologies make things really easier. These requirements need qualified personnel, trained and familiarized with the concept of “smart” technology, also able to train others. The development of the maritime industry means development of maritime training also which means implementation of advanced programs due to continuous change and evolution of this activity domain.

5. Conclusions

The use of “smart” technologies in the teaching process, especially at academic level, provides possibility not only for developing new teaching techniques but also for considerably improving the older ones. Considering la latest tendencies regarding development in technology, we can easily predict that future is going to bring many more changes in the teaching process.

This is why, it is very important for all lecturers to be provided with the opportunity of continuously updating their teaching methods, no matter what generation they belong to. We use the verb “to update” here, on purpose, due to its tight relation with technology. When we talk about lecturers updating their teaching methods we actually refer to them being able to properly use any such technology and to apply it successfully to the new teaching techniques.

It is therefore natural for these new techniques for teaching to require new ways of communication between lecturers and students. Teaching based on “smart” methods has a huge impact on the
information and knowledge transfer both with positive and negative aspects, but still subjected to a continuous evolution.

Future communication between lecturers and students will be happening more probably in the virtual space. Such communication could be easier also because interaction happens between users not face to face, and sometimes this makes both parties involved (students and lecturers) to be more open to discussion and opinion changes than in the real life.

The advent of both smart teaching and learning does not phase out traditional education completely, but it actually makes it more accessible and flexible. This is all possible due to the continuous and rapid development of smart technologies. Research within this field could have a lot of potential involving both concepts of smart learning and teaching which could become more efficient and reliable in the future. Use of “smart” technology in the maritime educational system could be also the subject of some international and national projects for improving interaction between lecturers and students. Continuous change in the teaching process is obvious and both lecturers and students need to be able to cope with the change and adapt.

6. References
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