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# The Role And Influence of Social-Media And Digital Media In Shaping The Training And Career of Aspiring Marine Engineers

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**Abstract:** Social media, which includes platforms such as Facebook, Instagram, and Twitter, is the most popular type of communication medium in the world today, particularly among young students. Social media has evolved with technology, and it has both beneficial and bad effects on academics, particularly on the student community. It distracts students and generates privacy and security challenges for those who are not aware of how to use the social platform appropriately, which has a significant influence on their academic performance. This study looks at how social media affects academic progress, social relationships, and student learning. A study was also conducted to analyse the effects of social media on the training and careers of prospective marine engineering students. Simulators are a key component in developing seafarer capabilities in maritime education and training. Emerging immersive techniques such as virtual reality (VR), augmented reality (AR), and mixed reality (MR) have opened up fresh and diverse opportunities for marine simulations and simulators. The growing advancements and technical readiness of such devices have paved the way for a new generation and category of simulators and simulation-based experiences for professional education, training, and operations that are less expensive, more interactive, neatly organized, and accessible when compared to standard designs.

**Keywords:** Social-Media, mobile learning, simulators, digital education, immersive techniques

## INTRODUCTION

Social media is an Internet-based technology that is frequently used to promote opportunities for social engagement among its clients. It has been boosted by modern means of communication and platforms known as social media. In recent times, the use of social media has been seen as expanding and embracing communication pertinent to academic purposes[1]. The quantity and use of social media sites in every country has increased dramatically. Faculty have not been immune to the allure of social media, and it should be highlighted that not all faculty are enthusiastic about social media, particularly as it relates to their teaching [2]. Despite the fact that technology has grown more popular in academia, there is a widening disparity in the adoption of technology between students and educators. How can colleges and universities maintain pace with technological investment, and how can faculty members keep up with the rapid rate of technological change? These are the crucial concerns that must be addressed intelligently and responsibly [3]. It is appropriate to state that digital education is an inevitable component of education. Digital education in India will be an emerging and crucial face of the country's forthcoming educational system. It is amazing to witness, particularly in light of the pandemic Covid-19 issue, how intelligent technologies are changing the general structure of the country's educational system [4]. Social media is utilised in academia for a variety of reasons and purposes, including boosting teaching and learning by offering learning assistance to both instructors and learners, such as e-guidance, e-feedback, and larger e-solutions. In their duties as employment consultants in Marine universities, academic staff members use social media platforms in collaboration with Maritime firms [5]. Shipping is one example of a maritime-related activity that functions in a complex socio-technical environment characterised by a diverse collection of operational, legal, fiscal, political, social, and global variables [6]. Seafarers are among the most essential elements of properly operating today's contemporary, modernized ships.

As a result, mariners require the appropriate knowledge and training to properly handle the multifaceted nature of operations. Maritime education and training (MET) is critical for developing qualified people that increase the safety and efficacy of a system [7]. The digital shift and its consequences on continually developing technology have had an impact on the organisation of maritime-related industries and the conventional roles of sailors. Maritime education includes all of the obligations assigned to other streams of education, but it also includes extra training features since cadets must adapt to the environment onboard a ship. They must learn and finish several levels of competency training on a regular basis in order to advance, and a pre-sea cadet must also complete particular STCW courses before contracting with a shipping business. This includes additional real-time experiences that can only be provided by simulations, sailing mariner experiences, and visual depictions of ship atmosphere during normal and critical operational situations. In one of the recent studies, it is recommended to use Near Field Communication technology as a customised interactive self-study mobile tool tailored to cadets' various learning styles in order to instruct the Cadets on-board the training ship [8]. Education digitization is one of our nation's key priorities, with internet access in India predicted to hit 55% in 2025. Several online instruction portals have arisen and are flourishing as greater numbers of learners register in online programmes. Multiple social networking sites yielded results [9]. One of the research found that students liked and put forth efforts in this innovative atmosphere for learning, which boosted their ability for imaginative problem-solving and analytical thinking when guided by teachers [10]. To assist students in efficiently using technologies within a specified setting for learning, experts must constantly examine and design instructional techniques that facilitate them. Teachers likewise have to encourage learners to be active participants and writers of their own distinctive personalities and innovative ideas. The ideal method to employ digital media technologies in the classroom is to provide pupils with every opportunity to build a holistic global perspective [11].

## DIGITAL TECHNOLOGY IN MODERNIZING EDUCATION

There are several digital approaches accessible today that, with proper instruction, may be utilised effectively for educational and training purposes. This section describes a handful of them. A few devices for such purposes are also seen in Fig. 1.

### *A. Access to Online Classes and Programs*

One of the first basic insights regarding digital media and learning is the fact that it has an increasing number of online institutions and programmes available. Massive Open Online Courses, or MOOCs, are becoming more prevalent and are even accessible at no cost. With such features, teenage as well as elderly learners are able to collaborate from anywhere in the world at any moment and easily attend these programmes from their residences.

### *B. Digital or e-Books*

When you glance into the bags of many high school and college students, you'll realize that iPads and other internet-capable gadgets are progressively replacing paper textbooks. Because of the swift rise of online media, electronic books, e-readers, and learning apps designed for iPhones, iPads, and smartphones, the textbook is "going obsolete" in several sectors. You may avoid hauling a big rucksack full of books since education is shifting online.

### *C. Mobile Learning*

Mobile learning, often known as m-learning, is a method of instruction that occurs when a learner is not in a fixed, defined location, or when a learner gains from the use of mobile devices and its capabilities. In a nutshell, m-learning is a type of e-learning that is aided by smartphones, palm PCs, and personal digital assistants [12]. The Massive Open Online Courses may even be attended on a smartphone. Students may simply launch the course, plug in their headphones, and follow along with the lessons and discussions in class. Whether commuting by bus, rail, or tube, one may instantly connect to a world full of learners and learning.

*D. Personalised Teaching and Learning*


Fig. 1. Methods for Teaching the Mobile Generation.

Because of the rising use of modern technology in the classroom, teachers are presently more capable to personalise courses, guidelines, and assignments to each cohort or individual. By employing gadgets and applications for distributing classwork and projects, teachers may personalise classes and lay a higher priority on the work of all learners. Students may receive individualised training, and instructional tools allow them to study, execute, and succeed at their unique speed. Teachers may now provide students with immediate assistance, scores, and observations via online platforms, school portals, and log-ins.

*E. Guidance and Support from Multiple Kinds of Teachers*

On a worldwide scale, the expansion of digital technologies has also influenced students' connectivity to the services of a diversity of teachers and trainers [13]. One student can engage in a multifaceted online session with teachers from Africa, the United States, the United Kingdom, Argentina, Portugal, Moscow, and Germany at the same time. Professors represent a range of origins and countries, and everyone contributes their own distinctive ideas, customs, and language of instruction to the classroom.

*F. Classroom Collaboration and Peer-to-Peer Learning*

Expanded possibilities for online education, whether a portion or full teaching, allows for more options for student participation from different places. Students from all regions can be featured in student bodies, which may include students from anywhere in the globe. Furthermore, varied student populations broaden the range of perspectives and ideas to group projects and debates in class. Students can communicate proposals both within and outside of the classroom by using web-based tools and gateways. Students are able to interact informally using social media sites such as Pinterest, Facebook, and Twitter, as well as through school-sponsored initiatives. Peer-to-peer learning has gained in prominence as students engage with each other over online discussions and exchange papers utilising technologies such as Google Docs [14]. Teachers encourage peer-to-peer discussions by creating interesting and perhaps essential classroom environments.

*G. Data-Driven Instructions and Outcomes*

Another change triggered by the advancement of digital technology is the advent of data-driven education and output. Despite the fact that some instructors are forced to utilise online gadgets and apps for evaluation, analytical tools are becoming more accurate. As a result of these gadgets and assessment systems, a teacher may be less able to assess a student's success according to the content of their work, their demeanour in class, as well as additional factors.

Although any of the above methods can be used by a student for learning purposes, when it comes to a well-designed course according to the curriculum or syllabi, records such as lesson plans, course material, attendance, assignments, scorecards, and so on, should be maintained and monitored by the trainer to ensure the effectiveness of the course delivery. When a corporation or educational institution implements an e-learning scheme, it additionally needs an administration system, or what is known as the learning management system (LMS), to maintain and execute the course of study [15]. The training sector operates by user contact with course holders and contents or with multinational LMS. This sort of learning unit comprises an array of audio, video, and other information that may be broadcast or saved based on the student's preferences and demands [16]. The amended STCW Convention acknowledges the benefits of e-learning, but further study into this complicated topic should properly describe these benefits.

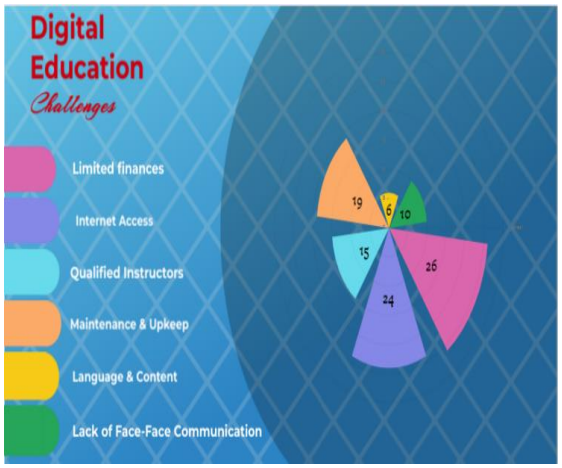


Fig. 2. Pertinent Challenges in E-Learning and Online Education.

Despite digitized learning offers numerous advantages, there are certain obstacles that must be addressed before e-learning/online education can be successfully deployed. Fig. 2 depicts the most significant problems. Quality content is required for e-learning. It may be particularly successful when combined with a multifunctional mentality that strives to develop material for whatever platform or device that the learner is using.

**MARITIME EDUCATION AND TRAINING (MET)**

Human resource training, development, and education are critical to the long-term viability of any business. This is especially true in the maritime business, where negligence by humans accounts for a major portion of marine accidents. Crews that are skilled and competent are vital for the safety of vessels and the maritime environment. As a result, the marine sector invests significant funds and time in developing exceptional innovative training programmes. The effectiveness of e-learning is dependent on comprehensive educational programmes and material. A variety of organisations (Seagull Maritime AS & Videotel) have created audio-visual courses with varied applications in marine sector. Such courses enable users who are at sea or at inaccessible on land locations to learn through internet. In most situations, mariners are educated through two distinct systems[17]. One consists of elementary and high school education, while the other comprises of specialized training programmes in accordance with the International Convention on Standards of Training, Certification, and Watchkeeping for Seafarers (STCW), a convention that does not form a component of the traditional system of education. The International Maritime Organization (IMO) established educational guidelines for seafarers through STCW 78, incorporating a minimum competence standards that seafarers must fulfil but also, at a global scale, settling the matter of the validity of country-specific certificates of competence and comparing several nationwide training and education programmes.

The STCW underwent significant alterations in 1995 with further amendments adopted in Manila in 2010.The adoption of e-learning and distant learning was one of them. These systems of instruction and training have been officially acknowledged in terms of educating mariners, but they have not yet been precisely stated. Even on standard face-to-face pre-sea training, e-learning facilities are introduced for STCW, where cadets must complete e-learning for a set length of time before taking an online exam. The completion of an entirely online exit exam will not result in the generation of an online certificate unless e-learning is also completed. The goal of using simulators in maritime training is to transmit capacity, which includes the ability to apply the mechanisms learnt when educating a trainee on vessel operations [18]. Cadets may now practise and refine their nautical abilities before even stepping foot on an actual ship, thanks to modern technology and sophisticated marine models. Because real-world training exercises have safety, economical, and ethical limits, simulator-based training is a strong and cost-effective alternative that allows teachers to generate a number of reproducible situations which they would not otherwise be able to train in. A well-constructed simulation can improve learning, effectiveness, and accuracy by bridging the three-dimensional (3D) gap between simulation and actuality. Many maritime institutes have budgetary limits when it comes to investing in simulators and innovative training technology. When it comes to training bridge officers, simulator training has grown to be the standard of excellence. The vast majority of shipping corporations now employ navigating bridge simulators to teach deck officers, while a

significant number of ships use simulators to train engineering officers.

**MET-IMPROVING TECHNOLOGIES**

Because of modern technology breakthroughs such as virtual reality (VR), augmented reality (AR), and mixed reality (MR), present maritime training tools and methodologies are being upgraded. Head-mounted-displays (HMD) for wearable technologies such as VR, AR, and MR provide a fresh and exciting supplement to professional education and training. The focus of MET providers and maritime simulator makers has traditionally been on high-end comprehensive mission simulators that include hardware and software to mimic realistic, high-fidelity operational situations at sea. The MET simulator industry now lacks customized immersive, mobile, and affordable training alternatives given by personal consumer electronic platforms. As a result, further research into how modern tools such as VR, AR, MR and HMDs may effect marine activities, MET, and the maritime sector throughout its entirety is required.

The capacity to combine cutting-edge technology into ordinary education and training techniques is becoming more practical as the computational power and usability of sophisticated consumer devices increases gradually as comparative cost levels decline. This opens up new opportunities to research methods to enhance both students' and instructors' educational experiences. A comprehensive governing structure has been developed for the marine industries to ensure that mariners are competent to execute required jobs. Still, as technology and operational demands evolve, so do methods to developing certain abilities.


Fig. 3. Virtual Reality Utlised in Maritime Sector.

Consumer devices (e.g., mobile phones, tablets, VR, AR, MR, and HMD systems) now provide a brand-new environment for ubiquitous training simulators, much as personal computers and the World Wide Web have provided new opportunities for sharing knowledge, distant learning, and communication. These very inexpensive, adaptive, and versatile tools enable linkages between individuals and educational institutions via mobile learning and communication platforms, virtual worlds, and dispersed training simulations. Figures 3-5 depict some of the immersive technologies that may be utilised in marine training and education.


Fig. 4. Augmented Reality Utlised in Maritime Sector.

Training may be done anywhere and whenever it is necessary in a vivid and immersive virtual environment. These technologies, by definition, expand access to MET instructional content and activities, which are normally limited to desktop programmes and simulators located in centralised training centres. The training anyplace, whenever idea gives instructors and trainees who take sessions at MET educational amenities, a greater degree of freedom. It can increase options for simulation training, beyond hours or at the learner's convenience, irrespective of location.

Economically, these mobile technologies can minimise both immediate and subsequent training expenses during a seafarer's career, including related expenses for travel, working overtime, and paychecks. The overhead expenses of operating simulator systems for purchase, operation, and maintenance necessitate significant financial resources for MET facilities. By providing user access while onboard,

travelling, or at home, VR, AR, and MR systems might minimise the length of time necessary at traditional MET facilities, expanding potential for immersive simulator training.

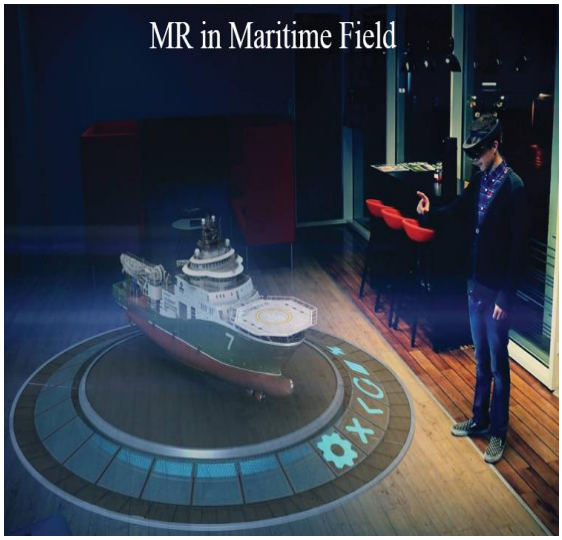


Fig. 5. Mixed Reality Utlised in Maritime Sector.

*H. The Instructor's Role*

The instructor plays an important role when teaching by providing feedback and information pertaining to students and their particular requirements along the course of study. During conventional marine simulator training, the teacher and student collaborate and interact regularly as a simulated scenario is carried out. The instructor-student interaction is critical in simulator-based instruction for improving the learning process and providing reinforcement through both verbal and nonverbal indications. A "hidden curriculum" cultivates during personal interactions between the instructor and the pupil (or a team of pupils), which may involve haphazard and informal learning instances that strengthen learning outcomes and classroom experiences along with the scheduled syllabus as well as academic results. Scaffolding, debriefing sessions, and mechanisms-reflections are also used by instructors in today's simulator-based MET to promote successful learning.

As virtual reality and mobile training solutions become accessible and used, the instructor's role and engagement of learners will expand. Personal training is accessible in traditional training facilities where learners and instructors may engage face to face. Furthermore, it allows for mobile and dispersed classes to be conducted on-demand or live via linked networks with other learners and instructors. Because of the training schedule's versatility and adaptability, several evaluation techniques and instructor involvement are required. In contrast to typical simulators, VR HMDs, for example, cannot enable teachers to track pupils' attentiveness or glance behaviour. As a result, creative techniques of engagement and integrated evaluation between learners and instructors must be developed, irrespective of if a live teacher is present in reality or through an internet connection. Mobile devices with surveillance sensors built in, comprising eye trackers, heart rate sensors, the accelerometers, and automatic performance scoring, can provide an even more impartial assessment as well as input on the tasks that trainees undertake. VR simulators may also provide more individualised instruction by adapting situations depending on the participants' past success and particular training demands. New technologies and instructional solutions such as VR, AR, MR, machine learning, artificial intelligence, and automated evaluations must be viewed as a supplement to the system rather than a threat to or substitute for standard methods for instructional delivering. These can be prospective choices that one can employ whenever and wherever they are beneficial. Finally, the knowledge and skills of subject-matter specialists as well as skilled teachers form the framework for student learning and the development of training programmes based on practical requirements.

*I. Onboard and Onshore Set-ups*

The employment of VR, AR, and MR technology can assist both afloat and ashore operations. Such systems provide new options and methodologies for controlling and commanding, circumstances testing, communication, and information exchange amongst employees, vessels, and ship-to-shore connections. Using mobile VR-HMD simulators on-board, the crew may practise complex offshore tasks and processes prior to executing things. They can also refresh their knowledge of technical, at risk, crisis, or seldom utilised abilities and circumstances. Navigation tactics

for unfamiliar, crowded, or hazardous rivers, for example, may be evaluated in a mobile VR-HMD simulator on-board a ship previous to being implemented in reality. Similarly, during maritime operations, specific skills and situations relevant to emergencies, ice navigating, challenging weather, equipment servicing, and logistics strategy may be practised and upgraded. In future times, crew may employ virtual reality (VR) "Digital Twins," as they are known, of ships to better understand the features of the ship before executing challenging operations or manoeuvres. This is particularly crucial when fresh members of the crew taking over the vessel and need to familiarise themselves with its specific surroundings, devices, and protocols in order to avoid missteps and mishaps. In the course of maintenance processes, maritime professionals may profit from AR and MR HMDs by obtaining sequential assistance via projected visualisations placed over actual machinery and workstations, augmented with either audio or written directions. In navigational processes, AR and MR may overlay route data, like the fix, course, and drafts, to the navigational officer or various members of the bridge crew. This could be very useful for navigating in low light. AR and MR are powerful technologies that provide users with increased data and message transmission capabilities, potentially adding captivating new components to current processes and activities and to prospective ship management and control setups.

*J. Using Existing Social Media Apps*

A particular grading system for technical videos and content sharing on social media may be established, which may be simply built into the current social media system. This will encourage active young users (pre-sea cadets) to investigate instructional content, and in the long run, it may increase the broad technical understanding of individuals engaged. This would enable a large number of trainee Cadets in marine MTIs to be on sync with current technological advances while also expanding their technical expertise in the fundamentals of ship operation and appliances. Using an AI system that analyses the content being uploaded, one may determine whether or not the information has technical worth. This must be based on metrics established by maritime professionals to ensure the quality of the material and the final score.

*K. Creating a Social/Digital Media App Designed Mainly for MTIs*

Building a specific seafaring social media app might be advantageous for all MTI trainee cadets, serving as a secure and accessible means for mariners to pass down the expertise they acquired from their service on-board ship. MTIs can be directed to make sure that all trainees sign up and download for the maritime-focused social networking app, and a maritime regulating authority in one particular nation may supervise or establish a system so that the material included in this online community is entirely maritime-related, as opposed to other social networking apps that merely include reels and snaps.

**CONCLUSION**

The educational and instructional procedure for marine officers includes a range of specific components such as competence, skills, perspective, personality, experience, and more, all of these can only be substantially and completely expanded using e-learning. As so, it might be argued that online learning cannot completely replace traditional methods of mariner training and certification. The International Maritime Organisation (IMO) has specified statutory educational workload, the subject, instructional employees, and frameworks-technical conditions of use, but the ratios of this instruction and training to be provided through online courses and in-person traditional learning have yet to be determined. However, new technologies are allowing the inclusion of e-learning and m-learning into the on-board employment environment.

Immersive tools, which successfully imitate real-world settings, may be an improvement in an appropriate direction in meeting the field's desire for more interactive training techniques. With the onset of the COVID-19 pandemic, these digital tools have been reinterpreted as a suitable replacement for standard education techniques. Furthermore, immersive technology training permits learners to integrate dangerous

emergency circumstances in training, which is unachievable in ordinary classrooms. VR, AR, and MR HMDs offer an intriguing addition, and potentially, in time, an invasive option to present MET operating methodologies and technologies, bringing up new business sectors and real-world uses for all sectors.

Still, like any form of emerging technology, particularly something as engaging as VR, AR, and MR HMDs, study is essential. Furthermore, current social networking Apps as well as a newly built digital media App for MTIs leveraging these immersive methodologies would make technology more accessible to Marine Cadets. A multitude of subjects must be explored and researched in order to more fully comprehend the positive and negative aspects of MET programmes as well as marine operations with immersive techniques. Studies based on evidence should lead to more effective deployments and the incorporation of such novel tools, leading to improved training and operational results.

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