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Building a Sustainable Future of the Maritime Industry

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Abstract. Maritime transport accounts for over 80% of global cargo shipments and offers numerous advantages. The main challenges facing maritime transport worldwide include increased operational costs of vessels, reduced emissions of pollutants from ships into the environment, and a significant number of maritime accidents and disasters due to improper or untimely actions by crews or shore services.

The research aims to formulate measures for building a sustainable future for the maritime industry in the context of sustainable development in a BANI world.

The methodological basis of the research included a systemic approach, engineering paradigm methods of analysis and synthesis, longitudinal analysis, selective surveys.

To build a sustainable future for the maritime industry in the context of sustainable development, it is not enough to modernize or implement innovations in the maritime sector alone, separate from other participants in the cargo transportation process from sender to receiver. The future of the maritime industry depends on all participants in the cargo transportation process, their strategic partnerships, which, when combined, can generate a synergy effect.

It is proposed to systematically introduce innovations throughout the value creation chain, which should be aimed at the dynamic balanced development of production, mining, processing enterprises providing finished products or valuable minerals for transportation, maritime education institutions, shipbuilding, machinery and equipment manufacturing, IT sphere, ship repair, suppliers of ship fuel, lubricants, spare parts, food, water, other transport companies, seaports, shipping companies, trade service organizations, market infrastructure, based on comprehensive analysis and forecasting of demand and consumer behavior.

Systematized directions of innovative development for the main links in the value chain - maritime transport, maritime education institutions, and seaports.

The research results confirmed the hypothesis regarding the use of the value creation chain, which will allow taking into account the needs and expectations of consumers in shaping the competitive advantages of maritime transport, reducing emissions of harmful substances from ships, reducing transportation costs, and increasing the income of maritime industry organizations.

The formulated proposals are recommended to be applied by maritime industry businesses to reduce the environmental impact on the environment, optimize costs, and improve the quality of transportation services for consumers.

Keywords: maritime transport, maritime education, seaports, innovative development**.**

1. Introduction

Maritime transport carries over 80% of the world's cargo and offers numerous advantages [1]. However, it faces significant challenges globally, including increased operational costs of vessels, reduced emissions from ships into the environment, and a high number of maritime accidents and disasters due to improper or untimely actions by crews or coastal authorities. Addressing these issues necessitates the exploration of new ideas for overcoming these challenges and further developing the maritime industry.

Research on the development of maritime transport, the infrastructure expansion of seaports, and logistics solutions has been conducted by scholars such as G. Ye. Bielaieva, O.G. Pustovit [2], O.M. Kibik, O.P. Podtserkovnyi, Yu.Z. Drapailo [3], M. Matvienko [4], and others. However, ensuring the safe and economic functioning of maritime transport within the context of sustainable development requires more than just innovations on ships and in shipping companies. It involves building strong competitive advantages for all participants in the cargo transportation process.

The aim of this research is to formulate measures for building a sustainable future for the maritime industry in the context of sustainable development in the BANI world.

2. Building of the Maritime Industry Value Chain

The concept of sustainable development is focused on satisfying the needs not only of the current generation but also of future generations. This is made possible by balancing three components of sustainable development: economic, social, and environmental. On August 25, 2023, the United Nations General Assembly declared the period from 2024 to 2033 as the International Decade of Science for Sustainable Development.

Our new reality is characterized by unpredictable and rare events with significant and unforeseen consequences. We are currently living in a BANI world, which stands for Brittle, Anxious, Nonlinear, and Incomprehensible) [5].

Success in a BANI world can only be achieved through innovation. To build a sustainable future for the maritime industry, for its safe and economical functioning, it is not sufficient to modernize or introduce innovations only within the maritime sector, isolated from other cargo transportation participants. The efficiency of maritime transport operation depends on all participants in the cargo transportation process, their strategic partnerships, which, when combined, can create a synergistic effect.

Building a sustainable future for the maritime industry depends on the harmonious functioning of the following participants (taking into account requirements and innovations in the political, legal, scientific, technical, sociocultural, and other factors of the macro-environment):

- Suppliers providing production factors (cargo from production, extraction, processing, and other enterprises with goods for transportation, fuel and lubricants, spare parts, food for crews, ship repair, the quality of educational services for crew members, etc.);
- Other transport companies (road, rail, air) and companies (banks, insurance companies, etc.);
- Shipping companies;
- Seaports;
- Distribution channels that transport the product to the consumer.
- Consumers of the product, using it to meet specific needs.

The BANI world demands the continuous reengineering of all business processes in organizations and boosting innovation in all links of the value chain since inefficient distribution channels or changes in consumers not considered by producers can lead to a lack of demand for products, and consequently, cargo transport will have no goods to carry. Similarly, maritime transport, if it does not consider changes occurring in previous links in the value chain (cargo flows, equipment at berths in seaports, the energy resource market situation, shortage of maritime professionals), will not be able to achieve its goals effectively and will not be competitive.

Let's delve into more detail about the key participants in the value chain: maritime transport, seaports, and institutions of higher maritime education (due to space limitations).

3. Trends in the Innovative Development of Maritime Transport in the World

Trends in the Innovative Development of Maritime Transport Worldwide, which will contribute to environmental improvement of maritime vessels, include:

- Increasing the linear dimensions of container ships to enhance vessel efficiency, cruise ships for quality tourist service.
- Utilizing fuel-efficient and environmentally friendly maritime vessels to reduce sulfur, nitrogen, and carbon content in bunkers.
- Using LNG as ship fuel to reduce harmful emissions from vessels.

Applying alternative energy sources (ammonia, hydrogen, biofuels, methanol, solar, wind, water) to reduce emissions of harmful substances from vessels [6].

- Container shipping: to accelerate unloading in the future, specially designed waterproof reservoirs will be used, which will be dumped overboard at anchor, and then tugs will deliver them to the pier.
- Prospective construction of underwater vessels.
- Implementation of intelligent transportation systems, transforming vessels into data processing centers.
- Enhancing maritime transport safety through the introduction of unmanned vessel management and more.

4. Formation of Maritime Officers Soft Skills in Higher Education Institutions

High-tech maritime vessels present new challenges in terms of maritime transport professionals' competencies. The development of a sustainable society places demands on the modern individual and maritime officers for employment and living: the ability to adapt in turbulent conditions and cope with any non-standard work situations.

Prerequisites for employment include competencies that enable seafarers to quickly understand what is happening in the work environment and respond immediately to new problems.

Maritime education must proactively shape hard and soft skills that align with the requirements of sustainable development and employer expectations, involving a mass customization of education.

In particular, requirements for the preparation of a new generation of maritime professionals are changing, emphasizing the need for soft skills that help individuals realize themselves as individuals, find employment, and a place in life and society.

Research identifies various groups of soft skills. However, the work of maritime vessel crews has significant peculiarities—it takes place in conditions of social isolation, beyond usual and direct contact with a wide social environment.

A harmonious atmosphere on board the vessel, created by the teamwork, contributes to the preservation of the health and lives of seafarers, successful work, and in critical situations, helps prevent panic and ensures the safety of cargo, the vessel, and the crew.

To determine the main soft skills that need to be developed during lectures, practiced in practical classes, and training sessions, selective observation was conducted.

Based on the results of selective surveys of 46 maritime officers enrolled in a master's program, with experience working at sea for more than two contracts, and studying at the Faculty of Navigation, the following soft skills were identified as necessary for a maritime career: resilience (95.1% of

respondents), attentiveness (87.8%), teamwork skills (85.4%), communication skills (80.5%), responsibility (73.2%), and leadership qualities (58.5%).

5. Directions of Seaports Innovative Development

The efficiency of maritime transport operation depends on the functioning of maritime ports, their level of technological and technical equipment, compliance with modern international requirements, and trends in management systems and infrastructure development. Efficient processing of worldwide maritime vessels, prevention of maritime accidents, and demand for the development of intelligent maritime ports exist. Port technology will simplify shipping by optimizing and accelerating various port processes. Additionally, it will have a positive impact on the environment (reducing greenhouse gas emissions due to shorter vessel stays in port waters and other modes of transport within the port area) and vessel safety [7].

Research into the directions of innovative development of leading ports worldwide has identified the latest trends in the port industry: digitization of logistics flows and data processing, the use of drones, automation of management processes, increasing port capacity, and more. These trends will contribute to environmental improvement, reduce the number of human errors, and thus enhance the efficiency of maritime ports' activities.

The proliferation of digitization in maritime ports will be facilitated by the implementation of the Internet of Things (IoT), robotics, artificial intelligence, unmanned vehicles and equipment, blockchain technology, as well as developments in the field of cyber security, 3D modeling, and 3D printing, among others [7].

6. Conclusion

To build a sustainable future for the maritime industry in the context of sustainable development, it is proposed to systematically introduce positive changes throughout the value chain. These changes should be aimed at the dynamic balanced development of manufacturing, extraction, processing enterprises that provide finished products or valuable minerals for transportation, maritime education institutions, shipbuilding, machinery, and instrument manufacturing, IT sphere, ship repair, suppliers of ship fuel, lubricants, spare parts, food, water, and other transport companies, maritime ports, shipping companies, trade service organizations, market infrastructure, based on comprehensive analysis and forecasting of demand and consumer behavior.

Systematized directions for innovative development for the main links of the value chain have been outlined, including maritime transport, maritime education institutions, and maritime ports.

The research results confirmed the hypothesis regarding the use of the value chain, which will allow for taking into account the needs and expectations of consumers when forming competitive advantages in maritime transport, reducing emissions of harmful substances from maritime vessels, reducing costs for cargo delivery, and increasing the revenues of maritime industry business organizations.

The proposed recommendations are recommended for implementation by maritime industry businesses to reduce environmental impact, optimize costs, and improve the quality of transportation services for consumers.

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Reviewing consequences of emergency transition to distance learning in efl classroom (ase Study of Foreign Languages Department of Batumi State Maritime Academy)

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Abstract. We are all aware that COVID19 has drastically altered our lives and lifestyles, which caused an emergency transition in all the fields including Higher Education worldwide. The learning process has been swiftly shifted into distance learning mode without any prior preparation and expectation of the educational staff (teaching and administrative) of the institutions as well as the students. This unprecedented transition necessitated incorporating soft skills and diverse e-platforms in the learning process, selecting between the most effective form among online (synchronous) and hybrid modes of distance learning in the EFL classroom. Moreover, HEIs were forced to encourage and mobilize educational staff without direct practical experience in order to ensure on-click transition to 'New Normal', prioritizing students' safety, resilience and mental health. Therefore, the presented paper aims at highlighting the outcomes of emergency transition to remote learning in EFL Classroom on the basis of a case study conducted by Foreign Languages Department of BSMA. With this purpose a quantitative survey was carried out through questioning the opinions of EFL students (both Bachelor and Master level) from the faculties of Navigation, Engineering and Business and Management of BSMA. The results of the case study were analyzed, processed and summarized in the form of generalized conclusion, on the basis of which practical recommendations were drawn for more effective planning and implementation of the EFL learning process during and after the Covid-19 pandemic.

Key words: EFL; effectiveness; F2F learning, hybrid / blended learning; online learning; e-platforms.

1. Introduction

It is obvious that Covid-19 indeed turned our lives upside-down, radically changing all areas of areas of lives, including our lifestyle. Educational sector other with Healthcare has undergone most dramatic changed, being forced to move to distance education in an emergency manner.

According to United Nations Policy Brief [1]: Education During Covid-19 And Beyond in the field of education, this emergency has led to the massive closure of face-to-face activities of educational institutions in more than 190 countries (UN Sustainable Development Group August 2020) to prevent the spread of the virus and mitigate its impact, which more than ever required taking reasonable and effective measures and urgent steps at the management level at all levels of educational institutions, in particular higher education institutions (HEIs).

It is noteworthy that Georgia managed to respond to the crisis in an urgent and effective manner and mobilize and support academic personnel and community with recent distance learning modalities and formats in tandem with caring for the students' mental and physical health and wellbeing through taking efficient steps, i.e. 1. Continuing education in Face-to-Face, Blended and Online format; 2. Country's readiness towards blended or online education; 3. Adopting new assessment methods; 4. Ensuring professional retraining of the teachers and students to fill the gaps in response to the digital divide and digitalization. 5. Providing technical support to HEIs in Georgia.

Before Covid-19 Pandemic, officially announced on March 20, 2020 English as a Foreign Language conventionally has been taught in traditional, i.e. Face-to-Face format. Therefore, after mandatory transition to distance education at all levels and academic programs in tertiary education in Georgia, educational authorities had to initially tackle the issue of continuing Spring Term 2020 in a new format and manner. Naturally, emergency transition period raised a cascade of questions among educational decision-makers and stake-holders, i.e. which format? Which academic disciplines and programs to be moved to online modality? Online or Hybrid Modality? Therefore, as the result of joining hands local and internationally, taking urgent measures and actions in order to ensure continuous academic process primarily by Educational Authorities, EFL Community also acted efficiently and effectively to respond to the crisis; Hence, EFL Educators together with Administrative staff took an active and effective steps in emergency transition to distance education via revisiting and adaptation academic courses in response to new needs and reality, being forced to fully switch to fully ICT-based learning environment. In, Georgia EFL instructors started to share and exchange their approaches to most effective online teaching platforms, programs (zoom, cisco webex, social media platforms, etc.) and did their best in order to timely respond to the crisis and succeed in mandatory integration of technology in EFL Classroom within shortest terms.

It is noteworthy that Technology integration in English as Foreign Language Education can be traced back to 60 of XX Century [2]. Demonstration of authentic materials (both written and oral) and teaching foreign language with communicative approach with maximal exposure to authenticity is achieved via effective integration of ICT in EFL Classroom. From this viewpoint, EFL Community of Georgia has always kept pace with recent demands and trends via continuous professional development and put into practice the digitally assisted learning process. To our luck, a series of professional development courses, webinars and online courses (MOOCS, Canvas) were organized by highly-reputable international organizations, i.e. IATEFL, MACMILLAN and others in synchronous and asynchronous format, as well as professional courses, seminar and conferences held

in hybrid formal, which indeed played a crucial role in putting the internationally recognized standards in EFL education into practice and ensuring comparatively less painful transition to distance learning as the result of already existing experience.

As shown with recent experience before the beginning of the first wave of the pandemic majority of EFL teachers (those not having access to the courses offered with MOOCS) were devoid of hand-on-experience to delivering a fully digitally-assisted academic process, without prior preparation and training. Though, as the result of unpresented support, unification of sources and mobilizing material/technical/intellectual resources, after selecting an officially licensed platform – zoom by Batumi State Maritime Academy, digitally-assisted academic process was successfully continued, ensuring an effective foreign language learning process maximally approximated with traditional setting via using multimedia functions, i.e. whiteboards, breakout rooms, chats, etc.

In addition to the abovementioned we should not forget that emergency transition to distance modality was related to unforeseen costs and expenses for the Higher Educational Institutions as well as for the academic staff and students. Though, this problem was immediately resolved via purchasing a licensed online platform – zoon to ensure continuous academic process, besides this necessary technical equipment were provided to the students and teaching staff in need of the latter. Despite of taken steps, other side problems, i.e. continuous and high-speed internet, inappropriate technical facilities still created problems and barriers for effective delivery of the academic process. In tandem with the above-mentioned technical character problems, other challenges were identified, which was basically related to extremely high workload for the academic as well as administrative staff (24/4). As teaching English as a Foreign languages requires integration and practicing of all four language skills (reading, listening, speaking and writing) during one class therefore it naturally requires proper planning and organization, though this was still achieved during distance modality and within shortest term and with existing resources it became possible to receive maximal results and feedback via practical activities during synchronous regime (i.e. via zoom platform) and as well responding to the uploaded assignments in an asynchronous manner.

To sum up, from today's perspectives mandatory integration of technologies in the process of teaching English as a Foreign Language under force majeure circumstances has led to its own positive outcomes despite of faced problems and challenges, which first of all is the result of non-stop and continuous work of all the involved stakeholders. Therefore, our paper highlights all three – traditional - F2F, distance and hybrid forms of distance education and describes their positive and negative sides. Furthermore, the aim of presented work is to review the outcomes of emergency transition to remote

learning in EFL Classroom on the basis of a case study conducted by Foreign Languages Department of BSMA. With this purpose a quantitative survey was carried out through questioning the opinions of EFL students (both Bachelor and Master level) from the faculties of Navigation, Engineering and Business and Management of BSMA. On the basis of the survey results general conclusions were made.

Literature Review

There are following types of distance learning: Face-to-face, hybrid and distance (synchronous/asynchronous).

2. Face-to-Face Learning

Face-to-face learning is a traditional method of learning English as a second language, which requires mutual contact of lecturers and students in classrooms with the help of the resources, as: books, projectors, white boards, markers and so on. Moreover, it requires direct interaction among communicants. Besides, students pass their homework, exams and complete their task based learning in the live process form and other.

One of the main functions of teacher and lecturers are to rise motivation in students and enroll them in learning process to the full. The mentioned approach could be assumed as a teacher based process, as the function of teacher-lecturers are to supervise and monitor the learning process and at the same time to manage it effectively. According to UNESCO (2020) "face-to-face teaching offers opportunities for student-teacher interaction that are difficult to replicate at a distance, particularly where there is inadequate training for distance education" [9].

Accordingly, face-to face learning is characterized as follows:

1. The dialogue among students and teacher/lecturers;
2. Sharing knowledge among students, which provokes their enrollment;
3. Eye-contact, which encourages interaction.

The above characteristics are important mediator in learning English as a foreign language.

As the observation of language learners has shown, the face-to-face learning is characterized by such features as the social aspect, as it includes face-to-face meetings with students for the purpose of teaching, which facilitates socialization and networking.

In addition, the traditional audience is completely based on the use of printed material, such as textbooks, printed learning resources, handouts. Also, printed out authentic materials (newspapers, magazines), learning realia facilitating the study of English as a foreign language in an environment as close as possible to its native language. When teaching English as a foreign language in a traditional

format, teacher and lecturers have a chance to use variety of activities on a target language, which is tailored to all types of teaching styles, especially, kinesthetic and tactile methods that are very difficult or almost impossible to integrate in distance learning.

As for the teacher's creativity aspect, the latter can be realized during the "live (teaching) process". Of course, the teacher may use his / her own creative skills during distance learning to make the meetings more active and less stressful but, this undoubtedly requires more planning and preparation and is therefore more time consuming. As for the accessibility factor, we cannot deny that in face-to-face teaching, lecturers in classrooms are constantly available to students willing to help. While in distance learning, some students may be reluctant and do not ask to delve into a specific issue, ask questions, and so on. Thus, traditional classes offer more opportunities for both lecturers and students to learn English as a foreign language in a more effective and interactive way, as it is characterized by direct interaction after the end of the classroom session, even during breaks, and these relationships are related to human emotions [3].

The next noticeable advantage of traditional teaching is that it allows us to effectively manage distractions such as cell phones, noise, talking, copying, and so on. However, in distance learning, the greatest effort is required to manage student engagement (turn on cameras, sound), this is more easily achieved through eye contact.

During distance learning we cannot avoid cheating by students as if they are attending a meeting. Or, have fake eye contact, in front of the turned on cameras. The eye contact plays a favorable role in communication and feedback. Accordingly, "eyes are the window of the soul **[4]**, it can only be fully achieved through face-to-face interaction. It is also noteworthy that during face-to-face meetings, students are positively motivated by role model students for them, which is the biggest incentive for a relatively "weak" student, aiming to compete and excel while learning English as a foreign language like a successful group mate. This factor is more obvious during face-to-face learning.

According to Arias, Swinton, Anderson [5] “students in the face-to-face section have statistically significantly higher exam scores and statistically significantly greater improvement on the post-test instructor questions. There is no statistical difference in the improvement on the post-test overall nor in the improvement in the post-test standardized questions. These mixed results suggest that both course objectives and the mechanism used to assess the relative effectiveness of the two modes of education may play an important part in determining the relative effectiveness of alternative delivery methods”.

The next factor that characterizes traditional real classroom meetings are linked to the role of teachers and lecturers, who can understand students' problems, jointly seek ways of their common solution. Also, students can easily get support from a classmate when working in groups and in pairs, and finally, dialogue between teacher and student is more effective during face-to-face teaching between students and students.

3. Distance Learning

As a result of the pandemic, the learning process has changed radically and face-to-face learning has been replaced by distance learning. Distance learning integrates the use of digital materials and Internet resources in an educational environment. Distance learning has a fairly wide range of benefits, e.g., it is flexible in time and space, depending on the student's individual learning rhythm, and so on.

There are currently two types of distance learning methods: synchronous and asynchronous. According to Oxford Learner's Dictionaries the term "synchronous" is defined as "what happens or exists at the same time" [10].

Accordingly, the synchronous learning type belongs to a learning process that takes place remotely in real time. In distance learning, lecturers and students meet at a pre-scheduled time and their communication is direct using the technology platform of their choice. As Hyder and his colleagues define [6] "the roots of synchronous e-learning derive from three main influences: the classroom, the media, and the conference'(p.6). Besides, synchronous learning is defined "interaction of participants with an instructor via the Web in real time" [7].

As mentioned above, as a result of the pandemic, most of the higher education institutions in Georgia and in the world switched to the format of distance learning spontaneously and instantly. Therefore, the academic staff needed to master Internet platforms unknown to them in the shortest possible time, such as: Zoom, Microsoft Teams, Google Meet, Jist meeting and other. Different universities used different platforms, but in our case, Batumi State Maritime Academy used the licensed Zoom platform, which encouraged lecturers to conduct lectures on a continuous basis, to use 'breakout rooms' for group and pair works, also, different emotions for feedback, such as: praise, surprise, mutual understanding, celebration, etc.)

In addition, Zoom, like other platforms, has a screen sharing feature that is effective for learning materials, e.g. For sharing books as well as videos, audio, and chat interactions (e.g., assigning assignments, asking questions, etc.). To summarize the above, the synchronous method of distance learning has enabled English as a foreign language student to be actively and effectively

involved in the academic process, learning from home and safely with maximum effort during the "New Reality" of academic semester.

The synchronous form of distance learning is similar to face-to-face learning. This method is teacher-centered as well, however, with all the learning stages are fulfilled remotely, using technology. Accordingly:

- Time is planned in advance;
- is interactive;
- Includes group and pair work;
- It is possible to implement projects;
- It is possible to evaluate;
- Internet resources are shared via link, e-mail or so-called "chats" and others;
- Students are involved in the learning process.

As for the asynchronous method of distance learning, it is defined as "two or more objects or events" that do not occur at the same time (Oxford Learner's Dictionaries [10]). Therefore, the form of asynchronous learning is related to the rhythm of the student's individual and independent work, although the deadlines for task completions are defined. This means that students are provided with study materials and assignments for a set period of weeks, months. Asynchronous learning is "an interactive learning community that is not limited by time, place or the constraints of a classroom" [8] this method is student oriented implying self-teaching and self-instruction which was used before the pandemic in the form of mass open online courses (MOOCS) (short courses and vocational training). In addition, higher education institutions offer distance education at all three levels (undergraduate, graduate, and doctoral).

Students receive the relevant qualifications without visiting the university, only communicate with representatives and administrative staff via email, remotely register for subjects, watch course videos uploaded by the subject teacher, read officially uploaded study materials. For instance, Pegaso International University in Malta (www.pegaso international.eu).

Asynchronous distance learning is similar to synchronous, conducted remotely but is a student-centered approach that does not require immediate and face-to-face interaction between students and lecturers. This method requires:

- Self-discipline;
- Rhythm of individual work;
- Flexibility.

4. Research Method

A quantitative survey (Likert scale) was chosen as the research method. The study: ***"Assessment of English Language Distance Learning at Batumi State Maritime Academy"*** (see Annex 1) was conducted in asynchronous mode, which was uploaded through Batumi State Maritime Academy's electronic services platform in the student journal. The questionnaire consisted of 20 open-ended questions (please find the link below: https://docs.google.com/forms/u/0/d/1EDg1TL4tt_w8EAdGeCnoJQMjAWg5PN35kZWQ5PXQJno/viewform?fbclid=IwAR1e67VS2SZwhmUNi1Yw40PRP16lPOpIfKbA1eF1jaLjMs6GsaMQQNHxnsU&edit_requested=true). Participants had to choose answers based on the principle of multiple choice (1. Strongly disagree; 2. Disagree; 3. Neither agree nor disagree; 4. Agree; 5. Strongly agree). The total number of students (respondents) was: 300.

5. Analysis of Results

Table1. Results of the Survey

#	**Questions**	**1**	**2**	**3**	**4**	**5**
1	I had online learning experience before the pandemic	41.6%	17.4%	-	15.%	20.5%
2	The format of online learning was acceptable to me	8.7%	9.1%	25.5%	20.5%	36.2%
3	I felt comfortable at English lectures (general / specialized English)	-	-	-	26.8%	54.4%
4	Teaching English language was as interactive as before the pandemic	7.5%	10.9%	19.7%	21.1%	40.8%
5	I had the opportunity to engage in various activities (in pairs, teamwork using the so-called 'breakout' rooms on the Zoom platform)	7.1%	-	15.8%	26.3%	45.8%
6	I received timely and effective feedback from the lecturer	-	-	-	25.9%	60.8%
7	The lecturer gave explanations on and beyond uncertain issues / topics	-	-	-	22%	66.1%
8	I was actively involved in discussions / debates	-	-	17.4%	34.1%	40.3%
9	The proposed grading system was acceptable	-	-	16.6%	30.7%	40.5%
10	The offered learning material was diverse and relevant to the course	-	-	11.3%	35.5%	41.1%
11	The learning goals and objectives set by the lecturer were achievable	-	-	9.9%	32%	53.7%
12	English language teaching was effectively planned and organized	-	-	14.3%	29.4%	49.5%
13	I felt alone during distance learning	37.1%	20.7%	15.6%	8.2%	18.4%
14	Distance learning for me was stressful and depressing	40.5%	15.3%	16.3%	10.2%	17.7%
15	I did not have relevant technical skills during distance learning	39.7%	19.7%	19%	-	15.2%
16	The distance learning process was hindered by various technical issues (unstable internet connection; faulty equipment; lack of appropriate equipment; electricity)	21.8%	16%	22.9%	14.7%	24.6%
17	The process of distance learning was hindered by the lack of appropriate learning environment (isolated learning space, noise, etc.)	34.7%	18.4%	17.3%	12.6%	17%
18	I found it difficult to maintain self-discipline and stay focused during online learning	31.7%	20.1%	18.1%	10.2%	19.8%
19	Distance English learning equipped me with new and practical experiences	-	-	22.7%	27.1%	37.6%
20	During distance learning my ability to communicate in English in a virtual environment improved	7.5%	-	17%	27.2%	43.2%

6. Conclusion

The survey shows that the majority of students (60%) did not have experience of online learning before the pandemic, which is natural and understandable due to the fact that the format of distance learning was not used in Georgia before the pandemic. It should be noted that for most of the respondents (60%) the format of online learning was acceptable. It is noteworthy that the vast majority of the students surveyed felt comfortable at English language lectures (general / specialized English), which is a very positive fact for both, Foreign Languages Department as well as the whole Batumi State Maritime Academy. For most of the respondents teaching English was as interactive as it was before the Pandemic. As mentioned above, qualification upgrade webinars, trainings and online courses in methodology have contributed greatly to it. In 2020-2021 an unprecedented number of professional development courses were conducted in this area by international organizations (Macmillan Educational, National Geographic, British Council, IATEFL) as well as our partner organization (SR Teaching and Learning) and the English Teachers' Association (ETAG), which produced relevant results. Student satisfaction is a priority during pandemic, which is extremely stressful and tense. Majority of the students surveyed also mentioned that they had the opportunity to engage in various activities (in pairs, teamwork using the so-called 'breakout' rooms on the Zoom platform), which suggests teaching English as a foreign language based on the communicative method. It is a pleasant fact that the vast majority of respondents received timely and effective feedback from the lecturer and the lecturer provided explanations on and beyond uncertain issues / topics, which was extremely important because without the latter it is impossible to conduct an effective and results-oriented distance learning process. Lecturers' great efforts and their readiness to work 24/7 for students are appreciated.

74% of the students also mentioned that they were actively involved in discussions / debates, although this may still be biased assessment, although their high-level activity is worth mentioning, which is a prerequisite for mastering English as a foreign language in the right communicative context. The proposed grading system was not very acceptable for only 16.6% of the students and highly acceptable for the rest of them. The Quality Assurance Service of the faculty undoubtedly played a big part in it due to the fact that during the 2020-2021 academic semester the grading system for distance learning changed dramatically and became very flexible and efficient compared to the first wave of the pandemic.

The offered learning materials were diverse and relevant to the course to the for majority of respondents, which is really welcoming due to the fact that the lecturers tried their best to integrate

diverse and stimulating additional authentic materials into the lecture process and it is gratifying that it was seen by the students understood it.

It should be noted that the vast majority of respondents (85%) believe that the learning goals and objectives set by the lecturer were achievable, which is transparent due to the fact that the electronic learning process management system clearly reflects goals and objectives of the course, which was not unnoticed. It is gratifying to learn that English language learning was effectively planned and organized for the vast majority of students.

As for the question: "I felt alone during distance learning", students univocally gave positive responses, which was expected due to the fact that socialization and empathy is achieved better during face-to-face meetings needs no proof and so it is not surprising that for most students the current learning format was stressful and depressing.

Only a small proportion (15%) of the students surveyed did not have relevant technical skills during distance learning; 24% noted that various technical issues (unstable internet connection; faulty equipment; lack of appropriate equipment; electricity) hindered the distance learning process, while 17% stated that the distance learning process was hindered by the lack of appropriate learning environment (isolated learning space, noise, etc.), which is an external cause independent of them and it cannot be solved by external intervention.

About 20% of students surveyed admit that it was difficult to maintain self-discipline and stay focused during online learning, which can be explained by many reasons, including the fact that the format of distance learning was not taken seriously at first by a number of students and they still feel the same.

Finally, distance English learning equipped the vast majority of students (99%) surveyed with new and practical experiences, which in our view was not only new but also necessary and very important experience tailored to the 21st century global skills and the pandemic accelerated its implementation. It is noteworthy to mention that the majority of the students surveyed, with the exception of only 7.5%, mentioned that the ability to communicate in English in a virtual environment during distance learning improved, which is a really positive sign and an indication that despite a “virtual wall” between students and lecturers, effective communication took. Despite the small expected and unavoidable difficulties, challenges and shortcomings, teaching English as a foreign language on the example of the Batumi State Maritime Academy (the number of the students surveyed was 300) was successful and fruitful.

We hope that the theoretical knowledge, practical skills and undoubtedly valuable experience gained during the pandemic will contribute to the further development and application of English as

a foreign language teaching methodology, the results – both, positive and negative - will be analyzed and evaluated in more depth by specialists and experts and, ways and means of partial and alternative implementation in practice will be developed in the future.

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Interactive module "Environment protection" of Maritime English course on LMS Moodle for future ship engineers

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Abstract. As the maritime industry continues to evolve, the imperative to prioritize environmental protection and sustainability becomes increasingly evident. Future ship engineers play a pivotal role in ensuring the maritime sector's compliance with stringent environmental regulations and the reduction of its ecological footprint. This scientific article presents an innovative interactive module designed to educate and engage future ship engineers in the vital area of environmental protection within the context of a Maritime English course. The module integrates cutting-edge pedagogical techniques, multimedia resources, and collaborative learning activities. The module's content is structured to cover crucial topics such as international environmental regulations, emissions control, ballast water management, and sustainable maritime practices. It fosters a comprehensive understanding of environmental challenges facing the maritime industry and equips future ship engineers with the knowledge and skills necessary to address them effectively. The interactive nature of the module encourages active cadet participation through quizzes, case studies, discussions, and games. Additionally, it provides real-time feedback and assessment tools for teachers to gauge cadets' progress and comprehension. By utilizing Moodle's collaborative features, cadets can work together on group projects and exchange ideas with his groupmates. The results of this research demonstrate the module's effectiveness in enhancing cadets' environmental awareness, knowledge, and their ability to apply sustainable practices in their future careers as ship engineers. Furthermore, it highlights the potential for scalability and adaptation of this module to other educational contexts, thereby contributing to a more sustainable and environmentally conscious maritime industry.

Keywords: Environmental awareness, MARPOL, Online courses, Digitalization

1. Introduction

The maritime industry, a cornerstone of global trade and commerce, faces an increasingly pressing challenge nowadays: environmental sustainability. As the international community grapples with climate change, pollution (including those produced by military operations in Ukraine), and the depletion of natural resources, the need for responsible and ecologically conscious practices within the maritime sector has never been more critical. Central to meeting these challenges are the future ship engineers, who will bear the responsibility of ensuring that the industry not only complies with

rigorous environmental regulations but also pioneers innovative solutions for a more sustainable future. Environmental protection in the maritime sector extends beyond the boundaries of technological advancements and regulatory compliance: it demands a fundamental shift in the mindset and education of those who will work on the ships of tomorrow. Recognizing this imperative, this scientific article introduces an interactive module tailored specifically for a Maritime English course, hosted on the Learning Management System (LMS) Moodle [1], to equip future ship engineers with the knowledge, skills, and ethical foundation necessary to address the environmental concerns facing the maritime industry.

The objectives of this article are the following: first, to elucidate the pressing environmental challenges confronting the maritime sector, ranging from emissions reduction to the preservation of marine ecosystems, and second, to present a novel educational approach that bridges the gap between linguistic proficiency, technical expertise, and environmental stewardship. This innovative module harnesses the capabilities of digital learning platforms and incorporates modern pedagogical strategies to cultivate a generation of maritime professionals who are not only fluent in Maritime English but also environmentally conscientious and proactive.

2. Literature Review

Numerous studies emphasize the importance of integrating environmental education into maritime curricula [2, 3, 4, 5]. M. Cieśla and T. Opasiak presented the data of a survey among seafarers to determine the level of understanding of situational awareness as a predominant component of the human factor in most accidents in the maritime industry. They concluded the seafarers have lack of basic knowledge about the phenomenon of situational awareness, as well as a lack of skills due to insufficient training in the training center [2]. P. Chan, R. Norman, K. Pazouki, and D. Golightly in their research proposed various techniques such as being mindful of the environment and staying vigilant which allow individuals to improve their situational and environmental awareness [3]. D. Moroni, G. Pieri, M. Reggiannini and M. Tampucci proposed to use a mobile crowdsensing app to improve maritime security and awareness [4]. Thus, many initiatives seek to empower future ship engineers with the knowledge and skills needed to navigate the complexities of environmental challenges, such as emissions control, ballast water management, and sustainable practices. But the "Environment Protection" module within the Maritime English course on LMS Moodle [5] represents a timely and innovative effort to equip future ship engineers with the necessary skills and knowledge to address the environmental challenges of the maritime industry.

3. Methods

The experiment was conducted at Structural Unit of “Maritime Applied College” of Kherson State Maritime Academy (KSMA), Ukraine. 81 ship engineering cadets (men, 17-19 years old, pre-intermediate - intermediate level of English, same study conditions and curriculum) took part in the study. Cadets were divided into two groups: control (40) and experimental (41). The two groups are mostly the same. The experimental group included cadets K231 and K232, the control group - K233 and K234. Participants of the experimental group studied English as assigned using the LMS MOODLE e-course of two teachers.

During the research, the following methods were used: observation, study of practical experience, verification of creative works and application of tests. The state of the experiment of future ship mechanics was constantly monitored, the results of the students' activity were recorded. Experimental verification of the effectiveness of the obtained results and statistical analysis were carried out.

4. Results

The modern method of the educational process is a kind of mixed learning, that is, a combination of the traditional form of acquiring knowledge with elements of electronic distance learning (Learning Management System): modern information technologies. The participants of the experiment were offered to use the LMS Moodle platform, where students could find not only learning materials (according to different modules) and training exercises, but also communication in individual rooms, group discussions, creating projects, which is more attractive in the sense that it allowed more differentiation of learning. They were also more satisfied with learning Maritime English, everyone could choose a level to take the test and subsequently improve their score. Also, attendance at online classes has improved, and students have increased their diligence. In the classroom, the cadets demonstrated better individualization than in the traditional classroom. They learn the material more easily, and develop critical and creative thinking.

The module's content is structured to cover crucial topics such as international environmental regulations, emissions control, ballast water management, and sustainable maritime practices. Students get acquainted with the problems and accidents which took place in the past decades to predict operation of vessels as a factor of marine pollution in future. Oil with numerous products of its processing has become one of the main substances that pollute waterways. There are many sources of water pollution with oil products: coastal industrial enterprises, oil refineries, oil terminals, storage

facilities, pipelines, oil production drilling rigs, ports. Future professionals have a unique responsibility to learn how to be good managers of oceans and waterways, minimizing human impact on the environment both at sea and onshore, thereby conserving waters for recreation and livelihoods. In case of improper handling with spilled fuel, toxic detergents and paints, waste tanks, and plastic that has fallen into the water lead to spread of pollution of the marine world.

Students study MARPOL regulation which in total has VI Annexes. Annex I (Rules for the Prevention of Oil Pollution) of MARPOL provides for severe restrictions on the discharge of oil, oil residues, oily waters and a complete ban on discharge in special areas specified in the Annex (the Black, Mediterranean, Baltic, North and Red Seas, areas of the Persian Gulf, northwestern Europe, Antarctica and the Caribbean). For other places, dumping is allowed, but is subject to a number of strict conditions.

Annex II - Rules for the Prevention of Pollution by Noxious Liquid Substances, transported in bulk, provides for the division of bulk chemicals into 4 categories according to their degree of toxicity and potential harm, and their discharge from tank cleaning or ballast discharge may cause harm to marine resources and human health. The Annex establishes maximum concentrations of harmful substances during discharge or completely prohibits such discharge.

Annex III - Rules for the Prevention of Pollution by Harmful Substances Carried by Sea in Packages, provides general rules relating to packaging, labeling, documentation, stowage and limits for hazardous substances carried in packages.

Annex IV - Rules for the Prevention of Pollution by Sewage from Ships, deals with regulations relating to the discharge of sewage from ships, ship equipment for the control of discharge of sewage, and reception facilities for the reception of sewage in ports and terminals.

Annex V - Rules for the Prevention of Pollution by Garbage from Ships, establishes strict limits on the dumping of garbage into the sea in coastal waters and special areas, completely prohibits the dumping of garbage made of plastic, and imposes restrictions on the dumping of garbage made of paper, rags, glass and metal. As plastic waste occupies a leading position in terms of the amount of input and the amount of pollution of the marine environment. Plastic waste forms entire garbage patches floating in the oceans. They require careful monitoring, as they not only pollute the surrounding marine environment, but also create a serious threat to living organisms and a navigational obstacle for ships. The Annex also provides for the provision by States Parties of garbage reception facilities at ports and terminals. Special areas for the purposes of the Annex are the Black, Mediterranean, Baltic, North and Red Seas, the Antarctic region, the Caribbean Sea basin region.

Annex VI - Rules for the Prevention of Air Pollution from Ships, describes measures to prevent air pollution, including ozone-depleting substances, nitrogen oxides, sulfur oxides and volatile organic compounds.

With more than 70% of water covering our planet, the maritime industry thrives every day, and therefore shipping, which is entirely responsible for sea and cargo transport, is one of the powerful sources of marine pollution. With such rapid industrial growth, the marine ecosystem will inevitably be disrupted by unwanted problems such as marine litter and the effects of marine pollution. Marine litter and associated debris have been declared a major cause of global ocean pollution. In today's conditions, international agreements on the prohibition of dumping polluted waters and garbage into the open seas and oceans are of primary importance.

Water transport is the most economical, as it moves on the surface of the water, which performs a supporting function. Historically, water transport used human muscle power or wind energy, thus being environmentally friendly. Currently, water transport objects move on the basis of the energy of internal combustion engines, which is mainly due to their impact on the environment. All ships built after the entry into force of the international Convention MARPOL 73/78 must meet its requirements in terms of environmental protection; ships built prior to this date must be modernized to comply with the provisions of MARPOL 73/78 and national environmental regulations. The main operational shipborne pollutants can include oily and waste water, garbage and emissions into the atmosphere. The main part the global shipping industry is slowly but surely mastering new standards for the sulfur content in marine fuels, which will solve the problem of air pollution with sulfur dioxide [6, 7]. According to the 2005 annexes to the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78), the sulfur content of fuel on any ship in any water shall not exceed 4.5%. Now this standard looks outdated: the International Maritime Organization (IMO) plans to make 0.5% mandatory by 2025 [8].

While shipping plays a critical role in today's financial world, it should not come at the expense of the environment. With care and proper planning, ship owners can help reduce their environmental impact (slow evaporation, use of efficient ships and clean energy to reduce harmful emissions, proper and timely engine maintenance, use of absorbent materials to collect any spills, installation of oil a tray to collect any grease leaks). Ship owners can also minimize the amount of waste they produce and manage it well. Although this may seem like a daunting task, it is important to remember that even a small change can go a long way in saving the environment

In practice, reducing the sulfur content of the fuel leads to the abandonment of fuel oil and the use of either diesel fuel or low-sulphur fuels such as liquefied natural gas (LNG). The only alternative to the rejection of heavy fuel for the time being is the installation of special gas cleaners on board the ship to filter the exhaust of the main engine. Both options are expensive for shipowners. Since fuel costs account for 30% to 60% of all operating costs in maritime transport, even a partial switch to environmentally friendly fuel significantly increases freight rates - by 25-40%. Ports around the world are now exploring the possibility of switching to liquefied natural gas, which contains virtually no sulfur. An excellent alternative from an environmental point of view. The benefits of using LNG in maritime transport can be significant. Percentage reduction in atmospheric emissions of the container ship, the world's first LNG container ship, was 98% for particulate matter, 97% for sulfur oxides, 72% for carbon dioxide, and 60% for nitrogen oxides. Use of liquefied natural gas as a fuel for the main ship engines, as well as for the production of electricity to meet the needs of ships while they are in ports - it helps to curb the growth of pollution and comply with the increasing environmental restrictions of the International Maritime Organization (IMO), operating under the auspices of the OUN [9, 10].

Sea and river vessels pollute the biosphere with waste from operational activities and emissions in cases of ship accidents with toxic cargoes, mostly oil and oil products. You can prevent sea pollution with garbage by following simple rules. It is necessary to properly collect garbage, process it and burn it.

5. Conclusion

The interactive module "Environment Protection" integrated into the Maritime English course on LMS Moodle represents a significant advancement in the education of future ship engineers. This module was conceived and designed with the dual purpose of equipping maritime cadets with the linguistic and technical proficiency required in their field while instilling a deep sense of environmental responsibility. Throughout the paper, the critical role of future ship engineers in addressing the pressing environmental challenges facing the maritime industry was outlined. And detailed description of the module's content, design, and assessment methods was provided. This innovative educational approach, which seamlessly integrates language learning (Maritime English) with environmental awareness, has demonstrated its potential to bring about meaningful change in the maritime education landscape.

This module not only enhances cadets' comprehension of environmental issues but also fosters their ability to apply sustainable practices effectively. The incorporation of interactive elements such

as quizzes, case studies, discussions, and collaborative projects (e.g. H5P, Assignment) has encouraged active engagement and critical thinking among cadets. The real-time feedback and assessment tools have facilitated continuous improvement, ensuring that learners are well-prepared to meet the complex demands of their future careers. The scalability and adaptability of this module to various educational contexts and institutions underscore its potential to promote environmental protection on a broader scale. By nurturing a new generation of maritime professionals who are not only linguistically adept but also environmentally conscious, we can contribute to the global effort to reduce the ecological footprint of the maritime industry which is so important nowadays.

The prospect of further research can be seen in investigation of the ways in which future ship engineers can engage with local and global communities to promote environmental awareness and sustainable practices beyond their roles on ships.

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Stress and coping strategies in seafarers

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Abstract. The research presented in the article aims to investigate the main mechanisms of seafarers' stress and coping with stress.

The research was conducted in several directions. The first one was aimed at testing the hypothesis: seafarers' stress is manifested both in the form of deterioration of physical condition and mental symptoms also seafarers' stress levels vary according to the coping mechanisms they use. On the other hand, it is interesting which stress coping mechanisms are mostly used by sailors.

The study used the stress level questionnaire by L. Lemur, R. Tessier and Fillion, A stress coping strategies questionnaire (The Coping Inventory for Stressful Situations (CISS-21), and author-written questions were used to collect demographic data. 30 sailors participated in the research. A Statistical Package for the Social Sciences (SPSS) was used for data processing.

Keywords: Sailors, stress, coping strategies.

1. Introduction

Stress can be defined as a state of apprehension or mental strain resulting from challenging circumstances. It is a natural human reaction, designed to prompt us to tackle life's challenges and threats. Stress is a universal experience, but how we navigate and respond to it, significantly impacts our overall well-being.

The impact of stress extends to both the mind and the body. A moderate amount of stress can be beneficial, enhancing our ability to perform daily tasks. However, excessive stress can lead to both, physical and mental health issues. Developing effective coping mechanisms for stress is crucial to feeling less overwhelmed and maintaining our mental and physical health.

Individuals exhibit diverse responses to stressful situations, coping styles and stress symptoms vary from person to person. It is normal to experience stress in demanding scenarios such as job interviews, exams, excessive workloads, job insecurity, or conflicts in relationships. For many, stress diminishes as situations improve or as they acquire emotional coping skills. Stress is prevalent during major events like economic crises, disease outbreaks, natural disasters, war, and community violence.

While most people effectively manage stress and continue functioning, seeking support from a trusted healthcare professional or someone in the community is essential if coping becomes challenging.[1]

The maritime workforce constitutes one of the largest professional groups globally. As per data from the European Maritime Safety Agency (2020), the European Union alone employs around 280,000 individuals at sea.[2]

Seafaring is a profession that, due to many factors, is associated with physical and psychosocial stress. From a mental and physical point of view, seafarers' stress can be caused by several subjective and objective factors. Working at sea is associated with a heavy physical and mental burden; working on ships is one of the most dangerous jobs in the world. This is manifested not only directly in the work process but also after returning home. Prolonged isolation is an important factor.[2]

The article presents studies that have identified challenges faced by seafarers that create subjective and objective stressors.

2. Research paper

Along with the identification stressors of seafarers, it is also essential to grasp how seafarers navigate these challenges, as it significantly influences their mental health and overall job effectiveness. Seafarers, confronting prolonged periods of isolation, rigorous working environments, and the unpredictable elements of the sea, find themselves especially susceptible to various stressors that can affect their emotional and mental welfare.[3]

The authors of the study conducted in 2023, identify 5 groups of stressors affecting the mental and physical health of seafarers, namely: 1. Objective indicators – an acute change in body mass index, and decrease in self-esteem, 2. Perception of own mental health. 3. Behavioral manifestation - smoking, eating habits. 4. Psychological well-being — an aspect of manifested mood, and generally perceived stress at work and home; 5. Physiological consequences of stress, as well as based on behavioral indicators such as trouble falling asleep and waking up, etc.[2].

Another study, aimed to research the various stressors faced by sailors and associated coping strategies of employers, the research was conducted with the involvement of five single-handed sailors who entered into the 2006/2007 Velux 5 Oceans round-the-world race. “During the interview, Skippers revealed organizational (e.g., environmental conditions, isolation, sleep deprivation), competitive (e.g., lack of progress, yacht-related problems), and personal (e.g., family-related issues) stressors. Strategies used to deal with these demands included problem- (e.g., prioritized sequential thinking), appraisal- (e.g., rationalizing situations), emotion- (e.g., using available communications), and approach-focused coping (e.g., "what if" scenario planning).” [4]

The results of another study, conducted in Italy in 2012, confirm the connection of the seafaring profession with mental and physical stressors. The most important factors were separation from family, loneliness on board, fatigue, multi-nationality, limited recreational activity, and sleep deprivation. Considering these factors, Seafaring is still associated with relevant mental health risks. Information on known stress factors on board should be provided to seafarers to help them in lowering stress perception. Strategies for coping with "inevitable" stress conditions should also be investigated and developed. Strategies to reduce risks of stress should be directed to the different categories of seafarers, and the results of specific interventions should be evaluated. [5]

As for stress coping strategies, according to the APA Dictionary of Psychology, coping strategies are defined as an action, a series of actions, or a thought process used in meeting a stressful or unpleasant situation or in modifying one's reaction to such a situation. Coping strategies typically involve a conscious and direct approach to problems. [6]

Coping strategies can be healthy or unhealthy. Such as problem-oriented action, problem-oriented thinking, avoidance, bad habits (overeating, excessive consumption of alcohol, smoking), running away from the problem, ignoring the problem, etc.

Problem-focused coping in seafarers is oriented towards managing or altering the problem causing the stress. This type of coping is particularly relevant in the dynamic and often unpredictable maritime environment. It involves:

Planning. Seafarers employ strategic planning as a means to foresee potential issues and formulate effective strategies for addressing them. This could involve readiness for inclement weather, charting optimal routes, or scheduling maintenance activities to prevent equipment failure.

- Direct Action. This involves taking concrete steps to change the situation.
- Seeking Information. Continuous learning and acquiring information play a pivotal role.

Seafarers may involve technologies or exploring weather trends, gaining knowledge about emerging navigation technologies, or staying updated with international regulations. This maritime knowledge equips them to better handle challenges.

Along with this, some of the healthy stress-coping strategies used by seafarers include:

- seeking social support;
- Emotional regulation (meditation, relaxation)
- Fun, hobby, relaxation.[3]

3. Research method

The study used the stress level questionnaire by L. Lemur, R. Tessier, and Fillion (Lemur, Tessier-Fillion 2003) and A stress coping strategies questionnaire (The Coping Inventory for Stressful Situations (CISS-21)**,** 30 seafarers participated in the study**.** Descriptive and analytical statistical methods, Statistical Package for the Social Sciences (SPSS), and data processing method ANOVA are used for data processing.

4. Results of research

According to the results, all surveyed seafarers report physical and mental health complaints both during their time at sea and after returning home. The main physical symptoms of stress include insomnia, fatigue, tension, pain, and lack of energy. The psychological symptoms of stress include often being in a bad mood, sudden anger, irritability, and decreased motivation. These symptoms appear while working on the ship and do not stop even after returning home. It can be said that this is a long-term manifestation of stress. Therefore, one of the research hypotheses, seafarers' stress is manifested both in the form of deterioration of physical condition and mental symptoms, was confirmed, because the vast majority of participants mentioned both physical symptoms and psychological symptoms that were related to stress.

As for the stress coping mechanisms used by the interviewed seafarers, it was revealed that the majority of the research participants use a healthy stress coping strategy. Among them, focusing on the problem, looking for ways to solve the problem, seeking social support, helping a friend, and recalling and using past experiences. However, a small number of cases were identified, when participants used such unhealthy coping strategies as alcohol consumption, heavy tobacco use, nervousness, anxiety, and self-blame. Thus, it is clear that the majority of participants used healthy stress-coping mechanisms.

Based on all of this, it is interesting the relationship between healthy and unhealthy coping mechanisms and the overall stress score. It is logical to assume that a healthy stress coping mechanism is associated with low levels of stress and conversely, an unhealthy stress coping mechanism is associated with high levels of stress. The Analytical statistical method ANOVA was used to confirm above mentioned thesis. However, according to the results, no statistically significant relationship was found between these two variables.

5. Conclusion

As I mentioned before, stress is not an unusual phenomenon in people's social and professional life. And the seafaring profession is such a high-risk activity, that it is logical, that it is considered one

of the most stressful professions. The results of research conducted in various countries, as well as our survey, reveal high rates of stress among seafarers and the physical and mental consequences of this severe stress. The dominant physical and mental symptoms caused by stress are insomnia, fatigue, irritability, inattention, irritability, sudden anger, and anxiety. These are the factors that can have a significant impact on the seafarer's job satisfaction, and from the point of view of the mental state, fatigue, inattention, and insomnia - these are the skills that affect and determine the safety and quality of the seafarer's work. Therefore, periodic assessment of seafarers' stress levels and teaching them healthy stress coping strategies is critical for both personal and professional performance.

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Problems of Recycling and Utilization of Household and Industrial Waste in the Coastline of Batumi

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Abstract. Development of the infrastructure of the Black Sea coastal zone is one of the priority directions of Georgia. In order to increase the potential of the tourism sector, it is important to improve the ecological conditions of the Black Sea and the coastline. Despite the national environmental protection programme and the current Law on Waste Management, the problem of waste management is still relevant and noteworthy. The seaport and the terminal operating in Batumi strictly protect the requirements foreseen by the "International Convention for the Prevention of Pollution from Ships (MARPOL), 1973." Moreover, the Order "Rules for Monitoring the Movement of Ships in the Territorial Sea and Harbor Waters of Georgia and the Functioning of the Information System" has been in force since 2016. The purpose of this rule is to ensure the protection of human life, safety of navigation and protection of the marine environment by using the Vessel Traffic Monitoring System in the territorial sea and access corridors to the ports; detection of potential pollution of the marine environment from ships and their prevention. But despite the mentioned regulatory actions, there is a big problem in terms of waste recycling and utilization.

The article discusses the issues that make obstacles for ensuring the compliance with environmental protection norms within the city of Batumi and its surrounding area. The authors, taking into account the international experience of obtaining biogas from waste, propose the possibility of obtaining energy from the waste of the Batumi landfill for the purpose of waste recycling and utilization.

Key Words: waste recycling, biogas, electricity

1. Introduction.

In 1993 (in Lucerne, Switzerland) the Environmental Protection Programme was adopted at the Conference of Ministers of Environmental Protection of Central and Eastern Europe, and in 1996 - the Law "On Environmental Protection", which requires the development and implementation of a national programme based on a regular, five-year period. The first National Environmental Protection programme has been operating in Georgia since 2000 [1]. The second National Programme was launched in 2010 with the coordination of the Ministry of Environmental Protection of Georgia and cooperation with all interested agencies as well as with the financial support of the Dutch government [2]. In 2017-2021, the third National Programme of Environmental Protection was active, and in 2022-2026, the fourth National Programme has been operating [3].

2. Goal of work.

One of the important points of the National Environmental Protection Programme is the introduction of a modern waste management system. The problem is complex, because of uncontrolled pollution of landscapes, coastlines; pollution of facilities with household waste and waste from small enterprises and administrative institutions. Prevention of beach pollution is especially important in the coastal zone, as it is directly reflected both in ecological safety and the effective operation of the tourism sector of the region. The article discusses the possibility of obtaining energy from the waste of the Batumi landfill for the purpose of waste processing and sale, and in the light of solving this problem, it is analyzed how beneficial it can be to introduce a household waste management system.

3. Main part.

The draft law on "Waste Management" was prepared by the Ministry of Environmental Protection in 2008. It provides the definition, classification of hazardous waste, their production, transportation, disposal, decontamination registration and control of this process. Since 2008, a pilot project for the collection, transportation and destruction of hazardous medical waste has been operating in the Adjara region [2].

Despite the current law and relevant actions, the problem of waste management is still relevant and noteworthy. Development of the infrastructure of the Black Sea coastal zone is one of the priority directions of Georgia. In order to increase the potential of the tourism sector, it is important to improve the ecological condition of the Black Sea and the coastline.

Safe operation of the harbor and marine terminal has a great impact on the ecology of the coastline in the region of Adjara.

Moreover, the Order "Rules for Monitoring the Movement of Ships in the Territorial Sea and Harbor Waters of Georgia and the Functioning of the Information System," the purpose of which is to ensure the protection of human life, safety of navigation and protection of the marine environment; increase the safety and efficiency of maritime traffic, ensure rapid response to marine incidents and cases by relevant authorities, detect potential pollution of the marine environment from ships and their prevention by using the Vessel Traffic Monitoring System in the territorial sea and access corridors to the ports, has been functioning since 2016.

Pursuant to the amendment in the International Convention - "International Convention for the Prevention of Pollution from Ships (MARPOL), 1973" [5] – considered by the Protocol of 1978, no hazardous or polluting cargo of any type may be offered for carriage or loaded on board of a ship

unless the ship's captain obtains a declaration containing the information required by the regulation. The shipper is responsible for submitting the above mentioned declaration to the captain, and the shipper is also responsible for the accuracy of the information provided in the declaration form. Information regarding substances listed in Annex 1 of MARPOL must include the physico-chemical characteristics of the substances, as well as the information provided on the safety data sheet in accordance with IMO Resolution MSC.286(86) (the information must also include emergency contact numbers for the shipper).

In the harbor of Batumi, all the rules related to the safe use of waste are applicable [4]. Solid hazardous and household waste is sorted in the harbor. Hazardous waste includes items spilled with petroleum products, out-of-order accumulators and fluorescent lamps, etc. Hazardous waste is stored in a special reservoir filled with silt of 60 cm high and drains (Fig.1), through which the contaminated water leaking from the waste flows into a special system where it is filtered. In order to remove the collected hazardous waste from the port area, a certified company (in the case of the Batumi port, it is Ltd “Severi”) is addressed.

Fig.1. Special reservoir in Batumi port

"Batumi Sanitation Service", the institution responsible for the cleaning of the coastline area and the city in general operates according to the orders of the Minister of Environmental Protection and Agriculture of Georgia (orders: N2-772; N2-774; N2-775) [6,7,8] and regulates proper disposal of specific type of waste. This kind of waste includes: waste of tire, waste of electrical and electronic devices, waste of batteries and accumulators. This type of waste is managed by the Waste and Chemical Substances Management Department of the Ministry of Environment and Agriculture, which receives, processes, analyzes and monitors the submitted information.

250-300 tons of waste is accumulated daily in Batumi, while in summer it is even up to 400 tons. Up to 20 tons of household waste is collected from the boulevard in summer. Only 2% of the

mentioned waste is subject to recycling - it is sorted into cardboard and plastic/aluminum containers (Fig.2). The mentioned containers are bought by recycling enterprises.

Hazardous medical waste (from aesthetic centers, beauty salons and medical institutions) is being actively removed in Batumi. Decontamination of medical waste is carried out according to the norms established by the legislation. Waste in hermetically protected containers is brought into the fenced and protected area by a vehicle with a special permit and equipment. Destruction is done by incineration (burning), which is completely safe, both for the environment and the people.

Fig.2. Plastic/aluminum containers

The main part of household waste is processed at the Batumi landfill. After thermal treatment, the waste falls into the sea at a depth of 800 meters.

Despite the strict implementation of the current regulations, even the presence of small waves is enough to throw up waste on the coastline, which creates discomfort for the tourists or local holiday-makers at the sea.

One of the ways to solve this problem is to activate the landfill in Tsetskhlauri.

The construction of the Tsetskhlauri landfill, announced 10 years ago, is coming to an end (Kobuleti Municipality, Tsetshklauri village). The facility should be put into operation from 2024. The solid waste management facility is financed by the European Bank for Reconstruction and Development (EBRD (3 million)) and the Swedish International Development Agency (SIDA (4 million)) and its value is 7 million euros [10]. The new landfill is being built by the Turkish company "Goksin Insaat" and the project is being supervised by the organization "Monitoring Constantign".

The landfill is located on a total of 40 hectares (Fig. 3). Buildings necessary for the operation of the project have been built within the project. Four cells for storing waste, which are calculated for about 600 thousand tons of waste, have been arranged. In Adjara, no less than 90-95 thousand tons of waste is collected per year. The total area of the landfill cell will be 11.5 hectares, with a height of 15

meters. Waste collected in the city of Batumi, as well as in the other five municipalities of Adjara, will be placed at the new landfill.

Fig. 3. New Landfill of the Village Tsetskhlauri

Along with the filling of the cells, in the following years, 8 more new cells will be gradually arranged, where, after sorting, useless waste is disposed. Finally, it will be covered with soil. After burying useless waste, the produced liquid moves to facultative cells through special pipes, where, with the help of aerators, waste is separated from bacteria (Fig.4).

Fig. 4. The Infrastructure of the New Landfill in the Village Tsetskhlauri

The service life of the new landfill is estimated at 35 years (it may be reduced a little, as a device will be installed that will increase the amount of waste acceptable on the site. Before the landfill was built, the area of waste collection in Adjara had increased and, therefore, the amount of waste too).

A gas extraction system was organized on the territory of the new landfill, within which a thermal power station was arranged.

According to the experiment conducted in 2017 (With the financial support of the Union of Young Scientists and the Democracy Commission of the US Embassy, the experiment conducted in

the municipality of Kedi), we can get 3-5 m^3 of gas from 100 kg of organic waste, from which it is possible to get 0,87-1.45 kW of power [9]. Taking this into account, as shown in Table 1, in the case of electricity generation from the methane received at the city landfill, minimum of 2,4795 MW per month of power can be obtained. According to "Energo- Pro Georgia" data, the installed capacity for Batumi is at least 40 MW, for Khelvachauri 4 MW, and for Kobuleti 6.7 MW. The power obtained from the thermal power plant of the landfill can make a significant contribution to the energy system of the region.

Table 1

Season (months)	Amount of waste in tons on daily basis	Amount of waste in tons on monthly basis	Amount of organic waste in tons on monthly basis	Received power on average **per month** KW, MW
Tourist season (X, XI, XII, I, II, III, IV)	250	7 500	2850	2 479,5 kW 2, 4795 MW
Non-tourist season (V, VI, VII, VIII, IX)	400	12 000	3990	3 967,2 kW 3,9672 MW

The Tsetskhlauri landfill is about 50 km away from Batumi, which will increase the cost of transportaion of the waste from the city almost 6 times. Therefore, the construction of an intermediate station between Batumi and Tsetskhlauri is being considered by the consultants.

For Adjara, as one of the most important regions of tourism in Georgia, the implementation of this project is a priority in order to create high-level recreational or living environment in the background of bringing energy benefits for local or foreign tourists as well as local residents.

4. Conclusion:

1. The implementation of the Tsetskhlauri landfill project will fully solve the problem of illegal and environmentally incompatible landfills operating in the territories of Batumi and Kobuleti municipalities for decades;
2. In order to reduce waste transportation costs, it is desirable to start several similar waste recycling facilities in the region.

3. The benefits that the Tsetskhlauri waste processing facility will bring will be important for the improvement of both ecological problems and electricity supply issues of the Adjara region.

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Green cruising: eco-friendly technologies on cruise ships

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Abstract: Cruise lines are believed to be the world's t worst polluters. Even though cruise ships represent only 1% of the global fleet, they have quite a big rate of black carbon emission according to the European Maritime Transport Report 2021. Besides CO_2 emissions there are lots of other pollutants like sewage water, gray water, oily bilge water, hazardous and bio-wastes that impact the environment heavily. To overcome the challenge and improve passengers' perception of the sector, the industry shifts the spotlight to responsible tourism and extensively invests in green technologies. The industry promises net zero carbon neutral cruising by 2050. However, some industry experts and NGOs still sound the alarm regarding not sufficient measures and activities to be taken to ensure eco-friendly tourism.

The paper aims at analyzing the progress made by cruise society regarding responsible tourism, namely the effectiveness of green technologies on cruise ships to assess the sufficiency of the current activities. The results of the research provide useful information on tracking the results of the implementation of the intended goals and benchmarking of cruising sustainable development.

Keywords: green cruising; sustainable technologies; eco-friendly technologies; cruise ships; efficiency assessment

1. Introduction

Global cruise industry- a giant, that has been growing rapidly for the third decade and notwithstanding the colossal damage caused by the Covid-19 disaster, stays the fastest-growing and the most profitable sector of the tourism industry in the world.

Cruise lines operate with fascinating figures, showing incredible financial turnover, employment rates, and statistics. According to CLIA 2019 Economic Impact Study (CLIA-Cruise Lines

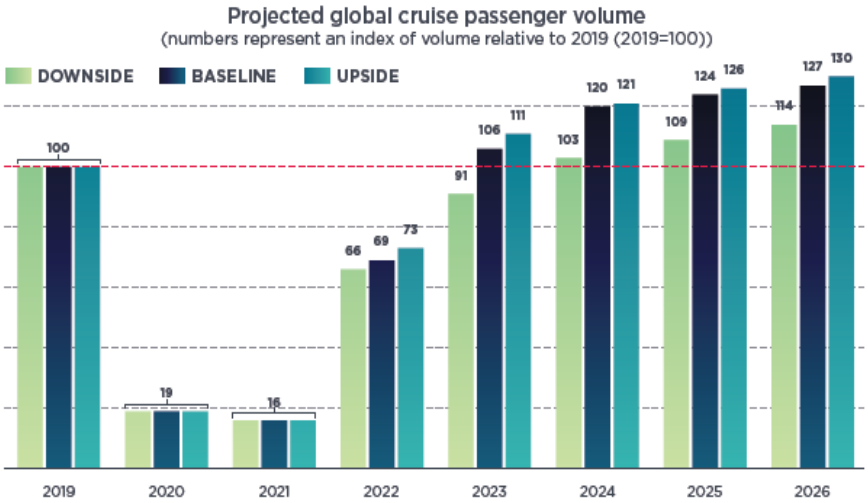

Figure 1. CLIA Cruise Forecast.
Source: Tourism Economics (December 2022)

International Association- the largest cruise industry association and the leading authority for the entire global cruise community), global cruising represents a $155B business with 1.2 million employees and $50B paid in wages. Although the 2021-2022 devastating pandemic has reduced several times the 2019's cruise numbers, for now, the cruise industry is recovering even faster than international tourism arrivals. The sector is moving closer to pre-pandemic levels. Moreover, CLIA expects the industry to overcome 2019's rates by 6% by the end of 2023, which makes 31.5 cruise passengers sailing worldwide. (Fig. 1) The sector is growing, and the cruise fleet does as well. According to the CLIA report, 272 ships were projected to be in operation in 2022. Despite all the positive tendencies, there is an opposite side of the matter that is called environmental impact.

A comfortable vacation in a "floating hotel" with all kinds of entertainment- sea travel on a cruise liner is just gaining popularity among tourists over the years. Meanwhile, environmentalists are sounding the alarm: they believe large cruise ships have already become one of the main sources of pollution today. A group of scientists from Spain, Croatia, and the UK conducted a study on the cruise ships industry, and as a result of which they called for limiting the cruise ship industry. Experts see the cruise industry as a danger to the environment. According to a study published in "Marine Pollution Bulletin" in 2021, the environmental and health impacts of the cruising industry are huge. For example, the carbon footprint of one large cruise ship exceeds the emissions of 12000 cars, and the waste produced by the ship is more than a ton per day [2].

According to Environment Journal, 46 cruise ships of Carnival Corporation & PLC in 2017 emitted almost 10 times more sulfur oxide (SO_x) into the atmosphere than all 260 million European cars. This conclusion is given in a study published on June 7, 2019 by the European Federation for Transport and the Environment (Transport & Environment Group). Among the countries most affected by sulfur oxide pollution are Spain, Italy and Greece, followed by France and Norway - those where sea cruises are most popular. According to the study [3], 203 cruise ships ply the waters around Europe, which make a significant contribution to the air pollution of coastal cities. In 2017, these 203 ships emitted 62,000 tons of sulfur oxide, 115,000 tons of nitrogen dioxide, 10,000 tons of particulate matter and more than 10 tons of carbon dioxide into the atmosphere.

2. The impact of cruise ships

In 2015 all the United Nations Member States adopted and set 17 Sustainable Development Goals (SDGs) to be reached by 2030. The goals are global and aim at promoting sustainable development worldwide across three basic dimensions: economic, social, and environmental. In the frames of the 2030 Agenda for Sustainable Development, the authorities of different countries are taking more and

more stringent measures against non-environmental transport both on land and water. However, maritime transport remains to be comparatively less observed and partially out of the view of environmentalists. This is especially true for cruise ships, which often visit ports where cargo ships do not call. They sometimes moor right in the city, causing additional harm to the environment. According to the T&E report, shipping remains the least regulated transport sector, especially when it comes to sulfur emissions. Environmental standards for sulfur emissions for maritime transport are 100 times higher than those for cars with diesel and gasoline engines.

As per Marine Pollution Bulletin, the activity of cruise ships leads to the degradation of air, soil, water, entire ecosystems, as well as wildlife. Every day, ships throw out about 56 liters of hazardous chemical waste, and a person's carbon footprint is tripled. In addition, cruises greatly affect people's health. For example, in the UK, between 40,000 and 100,000 people die prematurely every year due to emissions from the cruise and shipping industry. Residents of large port cities are especially vulnerable.

According to the European Maritime Transport Environmental Report 2021, larger ships emit larger amounts of black carbon gases. Oil tankers, container ships, and bulk carriers make up 60% of all black carbon emissions. Notwithstanding the fact that cruise ships account for only 1 % of the global fleet, cruise ships make up 6 % of global black carbon gases, which makes a huge amount of emissions per vessel.

Besides the poisonous air pollution caused by ships functioning, which includes emissions of carbon monoxide, sulfur dioxide, nitrogen oxide/ dioxide, and other harmful hydrocarbons, there are lots of other pollutants and wastes that derive from cruise ship activities and processes aboard. Among the damages caused by cruise ships, there is the waste of sewage water. *Sewage* or blackwater is wastewater containing urine and fecal matter that is generally disposed of directly into the open ocean. The sewage water represents a risk to human health as it can be contagious by transmitting dangerous bacteria to the seafood. Another wastewater that also gets into the ocean is *greywater*. Generated from non-industrial processes (drainage from laundry facilities, showers, bath, dishwasher drains, galley taps, etc.) it represents the largest amount of wastewaters produced by a cruise ship (more than 60%) and contains biological and chemical contaminants. One more source of liquid waste, gathered at the bottom of the cruise vessel and mixed with gasoline, metal shavings, oil, paint and other particles is called *oily bilge water.* The special equipment installed onboard the ship is supposed only to lessen the concentration of the amounts of this water draining out of the ship.

According to Nickie Butt cruise ships produce 25% of waste produced by merchant ships worldwide while representing only 1 % of it (Butt, 2007) [4]. Another statistics for cruise ship garbage management is following: “A medium-size cruise ship with 3,600 passengers can generate 2,358 m^3 of greywater and treated sewage, 84 m^3 of oily waste and 266 m^3 of solid waste weekly “(Kotrikla et al., 2021) [5].

It is difficult to determine the exact quantity of solid waste and garbage generated by the cruise ships globally, however the impact is quite heavy and depends on the policies and solid waste management protocols of the cruise companies and welcoming countries.

For now, cruises are a significant source of pollution and environmental degradation, and this industry should be under global control and effective legislation.

2. A model for responsible tourism

The negative environmental impact of the cruise industry is backed up with industry studies and statistical data. The fact is undeniable, yet unacceptable within the cruise community. While the green community and non-governmental organizations such as “Friends of the Earth”, “World Resources Institute”, “Global Footprint Network” and others clearly articulate their position towards “floating hotels” and publish evidences of environmental violations committed by the industry over the past 20 years, the cruise community firmly positions itself as a model for sustainable and responsible tourism. To overcome the challenge and improve passengers’ perception of the sector, the industry shifts the spotlight to responsible tourism and extensively invests in green technologies. In the 2021 report, Cruise Lines International Association (CLIA) declared a $23,5 billion investment in a cleaner future with new ships and sustainable development. According to 2023 CLIA State of the Industry Report there are some fundamental changes in the approach of tourism management. The innovations include proactive collaboration with port managements, local food sourcing and water repurposing/ conservation, as well as arrangement of *sustainable* onshore excursions. CLIA promises collaborations with marine life protection organizations to ensure noise reduction and wastewater treatment systems and devices onboard.

3. Going green: eco-friendly technologies

The cruise lines declare decarbonization by enhancement in technologies, operations and infrastructure, however, the claim sounds better than it actually is. Let's take a closer look at it.

For today LNG is considered to be the cleanest and most adoptable fuel available to cruise lines among the other marine fuels. Utilizing of LNG fuel compering to conventional ones reduces GHG by 20%, SO_x by 20%, black carbon particles -98% and NO_x by 85%. However, as of February 2023, there are only 21 LNG- powered cruise ship worldwide (11 active and 10 to be launched before long) that makes less than 15 % of the global capacity. [7] The 2022 CLIA report set ambitious goals: the industry promised net zero carbon neutral cruising by 2050, LNG-powered ships with wastewater treatment technologies, and exhaust gas cleaning systems as well by 2027.

The 2023 CLIA report declares:

- totally 38 LNG-powered ships to be functioning by 2028- yet only 11 is in operation;
- 75% cruise fleet to be able to consume sustainable fuels such as biofuels, synthetic fuels, hydrogen, methanol, batteries and others once available at scale- yet none is utilizing sustainable fuels;
- 60% of the ships to be fitted with shoreside power capabilities-yet only 30% do;
- 20 ports to be equipped with on-shore power by 2025 that makes 3% totally of the world's cruise ports- yet only 2 % is;
- New-build non-LNG cruise ships are equipped with (EGCS) Exhaust gas cleaning system, that makes 79% of global capacity (Fig. 2)- yet EGCS system is not considered sufficiently green and sustainable technology.

According to the Figure 2, the achievements shown in the 2023 CLIA Report are impressive, however, the pace of the development and quality of implementation of sustainable technologies is

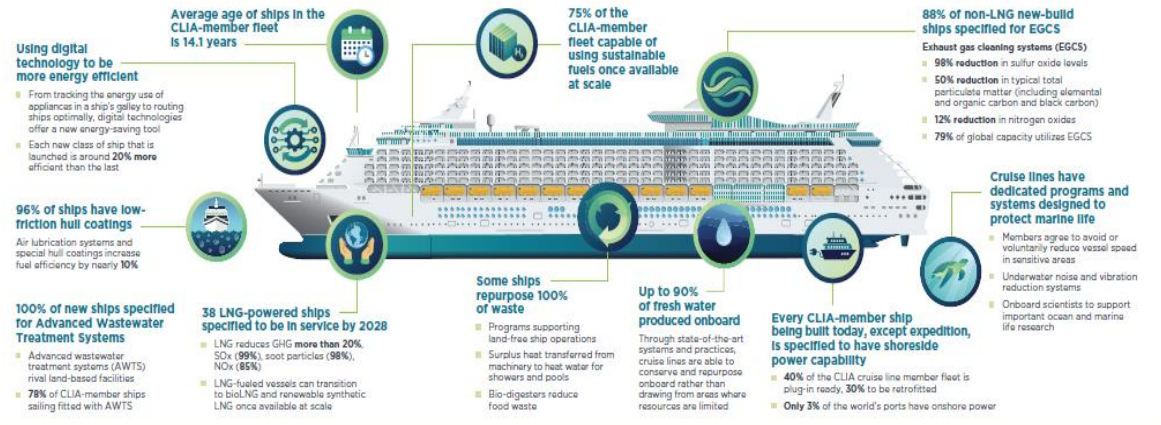

Figure 2. Responsible tourism approach onboard. Source: CLIA Environmental Technologies and Practices Report (October 2022)

not as encouraging as it might seem.

Some industry experts sound the alarm regarding not sufficient measures and activities taken to ensure eco-friendly tourism. When it comes to cruising, waste amount literally triples compared to onshore activities waste. Thus, going green means 3 times more diligence to protect the environment and provide responsible travel.

"Friends of the Earth" – the NGO that strives for a healthier and more sustainable world and evaluates cruise lines and ships for 13 years straight to answer one question: Is the green cruising possible or not? According to 2022 Cruise Ship Report card, where have been evaluated 18 major cruise lines across four environmental factors like *Water Quality Compliance*, *Sewage Treatment*, *Air Pollution Reduction* and *Transparency*- none of the evaluated cruise lines has received final grade "Excellent" (A) or "Good Performance"(B).[8]

4. Conclusion

The conducted desk research has shown that in the frames of global tendency of green technologies, environmental sustainability and announced 17 Sustainable Development Goals set by United Nations that are to be reached by 2030, cruise line managers are stuck in the strict frames and deadlines stated by global society. They are forced to meet the requirements of new standards and protocols, however the results are not sufficient.

The study has resulted in the following conclusions:

- From the perspective of scale, the environmental impact of cruise ships is underrated and has even more severe effects in the long term;
- Responsible cruise tourism onboard changes management system and enables effective approaches for intersectoral collaborations;
- Currently functioning and projected cruise ships with green technologies onboard don't provide enough sustainability to meet SDGs by 2030.

Conflict of Interest Statement

The authors certify that the manuscript has not been submitted to, nor is under review at any other journal or other publishing venue. The authors have no affiliation with any organization with a direct or indirect financial interest in the subject matter discussed in the manuscript. There is no financial interest to report.

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THE PRACTICE OF DISTANCE TECHNOLOGY APPLICATION IN THE TRAINING FUTURE MARITIME SPECIALISTS

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Abstract. In the article, the authors describe the features of the implementation of distance learning under current conditions in Ukraine for future specialists in the maritime industry. The authors analyze the benefits associated with the implementation of distance learning methods in the maritime industry, and also recommend the use of various innovative technologies, such as virtual reality, video conferencing models and online courses, which can improve the quality of education and training of future professionals. The scientific research analysis in the context of the specified problem has been carried out, and the trend of developing distance education as an element of sustainable development of maritime education has changed. The relevance of this article lies in the increasing need to modernize the educational process in the maritime transport, and the usage of remote technologies is becoming more and more widespread, especially in the current conditions in Ukraine: the war started by the Russian Federation in February 2022, the rapid development of the Internet and the communication technology. The maritime industry requires highly qualified professionals who have in-depth knowledge and skills in various aspects of this industry. The authors also note that lecturers' digital skills are the key ones in the success of distance learning for future maritime professionals, as they help to ensure quality teaching and effective communication between teachers and students, regardless of physical distance. The advent of distance technology allows providing educational applicants with wider access to educational materials, communication with experts and opportunity to acquire knowledge in real time. In the article, the authors give recommendations for lecturers, pedagogues, scientific and pedagogical staff, that can be useful in the process of distance learning.

Keywords: educational process, future specialists, distance learning, recommendations, higher education institutions

Introduction

The rapid development of information technologies is the main impetus for the transformation of education, updating its content, forms, methods and content, increasing the efficiency and the accessibility of quality education. The concept of maritime activity is relatively new for national legislation. According to the current version of the Maritime Doctrine of Ukraine for the period until 2035, maritime activity is an activity in the sphere of ensuring the sustainable economic and social development of society, studying, developing and using the sea, protecting national security, maritime trade (commercial operations related to sea vessels usage, purchase and sale of goods transported by sea, ship chartering, maritime agency, marine insurance, etc.) [1]. Taking into consideration the points raised above, the training of future specialists in the maritime industry, requiring theoretical reflection and practical implementation, should be based on the analysis and the research of the digital technologies usage in the educational process. The forced implementation of the remote form during COVID-19 became stressful for some student youth representatives, and neutral for others, because on the one hand, distance learning is safe learning in those cities that are either under occupation, or located in front-line areas, or do not have a good bomb shelter, but at the same time, the motivating factor for distance learning, especially during the war, will be one of the critical ones, as assessed by students and teachers themselves [7]. However, it should be noted that the implementation of distance learning in the maritime industry has many advantages: courses and training programs are accessible to future professionals around the world, allowing them to acquire new knowledge and skills without leaving the industry, their residences, educational facilities and even from their your own homes, providing ongoing training and development in maritime safety, navigation, technology and more. It is believed that distance education has become a necessity for maritime education for several reasons: first one, the maritime industry is international and global, that means seafarers and future professionals associated with this industry will work on ships that travel around the world; secondly, the maritime industry requires a high level of specialized knowledge and skills, and allows you to combine study and work, developing professional skills without a break in career growth; thirdly, distance learning allows future sailors and professionals to acquire relevant knowledge and update it in real time. Using digital technology and online resources, they can receive information about new regulations, technologies, innovations and processes that directly affect the maritime industry from their workplace.

The analysis of scientific research and publications showed that V. Bykov, O. Spirin, I. Smyrnova, E. Dolynskii, M. Zahirniak, E. Polat, G. Kravtsova, V. Kuharenko A. Khutorskyi, H. Yatsenko and others solve problems of implementation and use of distance education in higher educational institutions. The following scientists worked with the formation of basic competences of future shipping specialists: M. Babishena, O. Bezbach, T. Zaitseva, I. Sokol, M. Sherman, M. Musoryna, and others.

1. Peculiarities of the professional activity of future maritime industry specialists

The rapid development of informational technology over the last decades has a significant impact on various spheres of life, including education. Due to the rapid development of the Internet, computers, mobile devices and software, distance learning has become increasingly popular and accessible in Ukraine, especially in light of the war started by the Russian Federation in February 2022. Noteworthy, that one of the main advantages of distance learning is the opportunity to get an education anywhere and at any time, students can study the material and perform tasks remotely, without being limited by geographical boundaries or the schedule of classes. Distance learning also allows learners to use a variety of interactive tools, video classes, webinars and other electronic resources for in-depth study of the material; they can interact with teachers and other students through forums, chats and email. The educational space of a higher education modern institution in general, and of a maritime higher education institution in particular, includes an international component, because international relations are necessary for preparing future specialists for contacts with foreign partners, for coordination related production activities with foreign institutions, for assimilating the value orientations of the globalized world, to prepare for participation in international programs, projects and researches. Such a strategic vector leads to international coordination of several components of the educational program. Distance education is considered by scientists to be a form of educational organization, when university students are far away from teachers in space and time but can maintain dialogue through means of communication [2]. Providing access to educational materials and recommendations to work with them takes place at a convenient place and time. Distance learning technology includes educational and information technology. In his work, N. Morse explains information technology as a set of methods, means and techniques used by humans to carry out a specific complex process by dividing it into a system, system of interconnected processes and successive activities, carried out more or less clearly and with the objective of achieving high efficiency in searching, accumulating, processing, storing, presenting, transmitting data using IT tools

and communications, as well as the means of combining them with data processing processes without the use of machines [3]. According to V. Prybylova, distance education is a form of organization of the educational process, the basis of which is the independent work of students. This enables one to study at a convenient time and at a location far from the lecturer [8].

It should be noted that the EU's integrated maritime policy is based on the clear understanding of the interdependence of issues and the need for a common and coordinated solution between them. The following projects were selected as the most important: creates a barrier-free European transport area, promotes a European maritime research strategy, develops integrated national maritime policies, establishment of the European maritime surveillance network, development of a "roadmap" for marine spatial planning of EU member states, strategies to mitigate the impact of climate change in coastal areas, reducing pollution of the natural environment, including CO_2 emissions from maritime transport, eliminating pirate fishing and destructive bottom fishing in the high seas; forming a network of European maritime clusters, amending European labor laws in the fields of maritime transport and fishing [1].

Having analyzed the work of scientists [4, 5, 6], it was found that distance training for future specialists of the maritime industry has its own characteristics that need attention:

- Practical training is one of the challenges of the learning gap in the maritime industry, because of the inability to gain direct practical experience on board ships. However, training programs should include simulations and virtual simulations to help students acquire the practical skills needed for maritime safety and shipboard operations.

- Communication is an important aspect of distance learning, so using video conferences, email, forums or specialized platforms to discuss material and solve problems is essential.

- Self-discipline and self-organization are important and necessary elements in the training of future maritime industry specialists, since students do not benefit from the constant physical supervision of lectures. This is very important for successful learning and achieving set goals.

- Technological support, such as access to appropriate technology providers: available computers, reliable Internet, and software used in the educational process.

Summarizing the above-mentioned, it should be claimed that with the appearance of new equipment and technical systems, equipping river and sea transport with the latest equipment, provides wide operational possibilities, further lead to an increase in future skills requirements of maritime experts. That is why in the process of distance learning it is necessary to take into account the need to use all the possibilities of digital technologies, cloud services and artificial intelligence to create support in new quality methods in higher education institutions.

2. The role of digital competences of lectures in the process of distance learning by future maritime industry specialists

The development of innovative processes in the maritime industry requires the renewal of the complex of professional knowledge of future specialists, which becomes possible in the presence of high digital competence of lectures of higher education institutions in the process of distance learning. The development of digital competences stimulates the actualization of the content of educational programs, the quality of the material and technical content of the disciplines. Generalizing, we note that the role of digital competences of lectures in the process of distance learning of future maritime specialists is extremely important, since distance learning requires the use of various information technologies and online tools, and teachers must have sufficient knowledge and skills to use these tools effectively in the educational process. Key digital competencies that all lecturers must have include: technical skills, as they need to understand how to work with various computer programs, e-learning platforms and online tools; professors must be able to set up and use web conferences, video and audio recordings, electronic materials, etc.; possess effective communication skills in an online environment when teaching future maritime professionals, be able to explain the material clearly and comprehensibly to students using various communication channels such as e-mail, forums, classrooms, chats, etc. Lectures must be able to create and update learning materials, assignments, and assessments in a digital environment using digital tools, cloud platforms, or artificial intelligence programs. They should have pedagogical skills: must have an understanding of learning processes and be able to adapt their pedagogical approaches to distance learning, be able to create structured and understandable learning materials, support students in a virtual environment and provide effective feedback.

In closing, it should be noted that the digital competences of lecturers are a key factor in the successful distance learning of future maritime specialists, because they help to ensure quality

education and effective communication between professors and students, regardless of physical distance.

3. Recommendations to lecturers in the process of distance learning of future maritime industry specialists

Today, academically trained graduates must have a certain set of competencies that characterize them as individuals and qualified specialists. According to the State Educational Standards of Higher Education of Ukraine, the competencies of future specialists are determined by general cultural and professional competence [4]. Distance learning at the Danube Institute of the National University "Odessa Maritime Academy" was launched due to the Covid pandemic and then continued due to the Russian Federation's sudden invasion to Ukrainian territory in 2022. In this regard, distance education has become one of the most effective forms of providing quality education for future specialists in the maritime industry. The roles of the professors' staff of distance education are changing, which requires clarity of the role and the development of appropriate competency structures. In this regard, it is considered advisable to provide the following recommendations for conducting distance learning for lecturers, pedagogues and scientific and pedagogical staff:

- The structure of each distance course needs to be developed and balanced due to the student's independent workload and working with lecturers.

- When conducting lectures and seminars, it is mandatory to use multimedia learning tools (for example, simulation programs, video recording, Google Class and other digital platforms). To absorb the material more effectively, use video lessons and audio recordings, if possible, this will help to understand the concepts and visualize the theoretical aspects of learning.

- Mandatory teacher's consultation using digital technology and communication channels such as forums, email or video conferencing.

- Improvement of the methodical provision of courses appropriate to the technical and engineering specialization of future professionals in the maritime industry, this is achieved through the comprehensive use of modern engineering equipment and specialized licensed software.

- Development of a virtual educational complex system that creates the possibility of full reproduction and simulation of production processes. The development of "virtual reality" systems improves the quality of systematic thinking, the relationship between conceptual thinking and figurative thinking, contributing to qualitative changes in information absorption.

- Creation of virtual offices is the basis for laboratory work, practical classes, educational and scientific work and scientific research of education seekers.

- During practical laboratory work, an important task is to learn how to install, adjust and operate equipment and instruments.

- Through the transformation of traditional forms of theoretical and practical courses, which can be carried out synchronically and asynchronically, to organize the independent work of educational applicants, this must be the subject of reflection.

- Provision to future professionals certified courses, for example participating in international seminars, trainings and conferences to enhance their professional knowledge.

- Participation in the educational process of various motivational factors will encourage future professionals to actively research and better understand future professional activities, for example with the help of project-based learning.

- Development and implementation of integrated work training programs for graduate training of specialists in the system of continuous education, taking into account the interdisciplinary approach.

- Creation of online libraries in educational institutions and the study of additional literature, magazines and researches related to the maritime industry. The Internet and electronic libraries have many valuable resources that can deepen knowledge and understanding. Involve future specialists in this.

- Ensure the mental and emotional well-being of future specialists, because the current situation in Ukraine - the war - is a challenge for educational applicants. Provide support and understanding by creating opportunities for rest, recovery and connection between students.

Conclusions. Because the current situation in Ukraine is so unique, few studies have examined how lecturers change to distance learning in emergency situations. It is now important to understand which key digital tools and teaching features will help future maritime professionals to overcome their learning challenges and what strategies should be used. After all, receiving an education has become even more important: through it, those who get it can maintain mental and physical well-being along with hope for the future. At the same time, it should be noted that it is important in distance learning to support the professional development of lecturers in the field of technology, that in the future will ensure the development of professional and digital competencies of applicants of education.

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The Prospects of 4IR Development in the Tourism Sector of Ajara

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Abstract

In the article we discus about The Fourth Industrial Revolution (4IR), which is expected to drive rapid economic development, with AI replacing labour and new professions emerging in Ajara. Georgia, a country with limited global economic growth trends, should try to identify primary development directions and create business incubator spaces for effective model functioning in the tourism sector, particularly in Adjara. Adjara, a popular tourist destination, can capitalize on this trend by implementing 4IR technologies. AI can provide personalized travel suggestions, automate customer care, and identify scams. Big data analytics can analyse tourist movements, find new market opportunities, and create successful marketing efforts. Bots can provide tourist information and services, and IoT can develop smart tourism destinations with features like real-time traffic information and smart parking. In this term, we think that the collaboration between public and commercial sectors, forward-thinking policies, and significant human resource expenditures are essential for achieving the full potential of 4IR in Adjara's tourism sector. The article aims to evaluate the potential impact of 4IR technologies on the Adjara tourism industry, identify opportunities and challenges, and provide recommendations for sustainable growth.

Keywords: Tourism Sector, Artificial Intelligence (AI), The Fourth Industrial Revolution (4IR)

Introduction

In anticipation of the Fourth Industrial Revolution (4IR), world-renowned research institutions expect exceptionally rapid rates of economic development. It is expected that artificial intelligence (AI) will replace a part of the labour and new professions are predicted to arise. Updating skills will be especially important for employment that will exist in the future.

There is no question that a nation like Georgia cannot predict the trends in global economic growth, and it is especially difficult to choose the appropriate development vector in the conditions. Considering this, we believe that, in conjunction with other prospects, the primary directions of Georgia's economic growth should be identified. To introduce innovations, gain a new niche in international markets, and become an economic leader in the region, we think it is necessary to create business incubator spaces for effective model functioning in Georgian regions, particularly in the tourism sector in Adjara.

The Fourth Industrial Revolution is a period of technological innovation that is revolutionizing the way individuals live, function, and interact with the world. The 4IR differs in that it combines digital, physical, and biological systems and the speed with which fresh and emerging technologies, particularly when it comes to the AI, big data, robots, and The Internet of Things, are emerging. The Fourth Industrial Revolution is influencing the tourist sector on a massive scale, as well as Adjara that is well-equipped to harness the power of this revolution. In addition to the proper infrastructure, the region has the proper infrastructure, including natural attractions, cultural heritage, and history. However, the industry is still mostly traditional but has the potential to be further improved through the implementation of 4IR technological advancements.

4IR may be used in the following ways to enhance the tourist industry in Adjara: 4IR technology may be used to enhance the tourist business in Adjara. The most common examples would be using AI to give clients tailored travel recommendations, to streamline customer service tasks, and detect and prevent fraud, and so on. Big data tools might also involve targeting tourists' activities and interests and identifying new market opportunities to develop better marketing campaigns. It is possible to make bots call and provide tourist with information and services; as well as take away some routine tasks like check-in and check-out. IoT may also be applied to create smart tourist destinations which incorporate services such as traffic updates, smart parking, and smart energy grid systems.

The goal of the article "The 4IR (Fourth Industrial Revolution) development prospects in the tourism sector of Adjara" is to analyse how the adoption of various 4IR technologies may potentially affect the tourism sector in the Adjara region of Georgia, to identify opportunities and threats that this change brings to the tourism industry, and to offer recommendations for sustainable development and growth of the sector.

The aim of this research is to determine opportunities and threats concerning 4IR and its implementation and how it can support sustainable growth in tourism sector of Adjara region.

The chosen research strategy is quantitative and qualitative one that includes the literature review, survey, primary and secondary data analysis, and consultation with stakeholders to reach the stated aim and goal.

Literature review

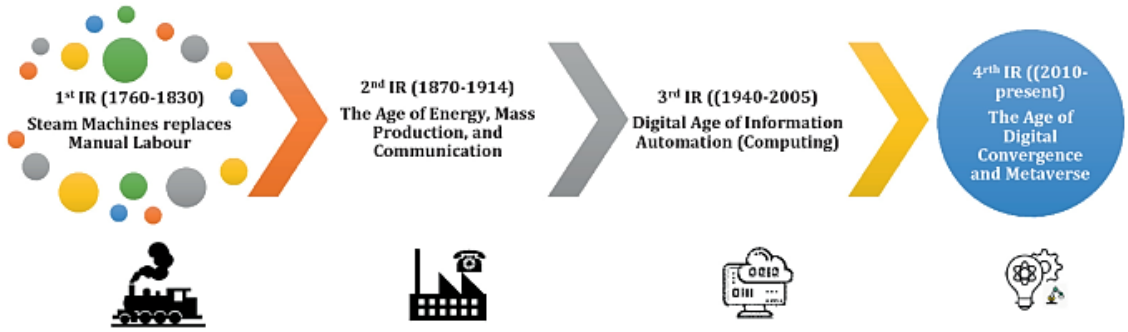
The twenty-first century is now being repackaged as a post-COVID-19 globalisation and innovation tale. But our story starts long ago – over three centuries. It is one of the most inspiring tales

of transformation and creativity. It is now possible to ascertain that we are living in the 4IR. It is called 4IR because we have experienced four discrete, disjointed editions of Industrial Revolution (IR).

These are the broad timelines of industrial revolutions development.

The **First Industrial Revolution** occurred between 1760 and 1830.The First Industrial Revolution was associated with a massive transformation of technological and economic systems away from agrarian and craft-based economy to one that involved industrial and machine- based production. Other key discoveries and inventions during this period include Mechanization, Steam Power, Factory System, Canals and Railways, Urbanization, Social and Economic Changes, Innovation and Capitalism. These changes provided the basis for further industrial revolutions and have transformed economies, societies, and life and work of the population.[1]

Figure 1: The Road to 4IR (4th Industrial Revolution) [2]



Source: *SpringerLink. Global Technology Management 2022*

The **Second Industrial Revolution:** From 1870 to 1914 the First Industrial Revolution developed the economic and technological basis of modern life. Some of the prominent characteristics of the Second Industrial Revolution are aligned below – Electrification; Chemical and Steel Industries; Internal Combustion Engine; Communication and Mass Media; Mass Production and Assembly Line; Globalization; Urbanization.

The Second Industrial Revolution featured both furious rates of creation and evolution of technologies as well as rates of economic growth that created the foundations of the modern industrial world. It also had other new negative impacts such as concerns over labour standards, environmental protection, and the governance of industrialization.[3]

The third Industrial Revolution also known as Kondratieff third industrial revolution is a period between 1940 and 2005 in which there was growth in electronics and information technology and automation. Some of the traits of this age include Computers & Electronics, Digital Age, Information

Age, IT Revolution, Communications, Telecommunications, Media, Internet, Automation, Robotics, Space, Biotechnology, Globalization and Environment.

The Third Industrial Revolution is the revolution that revolutionized our society, our economy and our communication that paved way for the digital age as well as the 4IR. It facilitated enormous development and resulted in some issues, such as the digital divide, and data protection and security. The diffusion of radical technologies as well as steam power, electricity, combustion engine, biotechnology and microelectronics has transformed contemporary capitalism. Theorists of economics have postulated three significant technical shifts: the first industrial revolution of the eighteenth century-the internal combustion engine and the electric motor – and the third industrial revolution today – focused on nano technology and global web.[4]

The **Fourth Industrial Revolution coined** as 4IR commenced in circa 2010s to the present and is typified by the integration of digital, physical, and biological technology. Some of the main areas of the Fourth Industrial Revolution include Digital Technologies; AI; IoT and connectivity; Blockchain; Biotechnology; Renewable energy; Autonomous vehicles; 3D Printing and Sustainability.

The Fourth Industrial Revolution is characterized as the era of great complexity wherein the physical, digital, and biological domains are no longer isolated from one another, creating significant opportunities and threats. It is characterized by speed in dissemination of innovation and transformation in various sectors that have impacts on employees, their ethics, and associated norms of society. In the era of a globalized and ratified world, this ongoing shift is altering the human experience and ways of life and labour. Top of Form

The coming fourth technological transformation is expected to significantly impact their lives, work, and interactions with a fourth transformation of a kind and complex move. For a responsive reaction to take place and be successful it has to be holistically responded to and this should involve and reach out to all stakeholders in the whole wide world especially the governmental sector and the business sector as well as the academics and all of civil society.[5,6]

Although further research is required to minimise the impact of COVID-19 on the tourist business, it can be stated that the virus has an impact on the tourist business and positively contributes to the future of the sector during future pandemics. The fact that the sector is a human service and exposure to the sector requires socially distancing makes it important to discuss the implications for the future. As per some of the academicians the tourist sector was not prepared well as to face the hard

times especially in case of e-tourism. An inquiry on how newly developed technology could support the sector in times of need is necessary.

The COVID-19 pandemic has hit the tourist industry hard as the viral infection has spread across the world and has had severe consequences on health. He also notes that nearly sixty million people have been affected and over one million have died due to the pandemic. The USA and EU were the first countries to report the events with the least number of cases occurring in the west of the globe. as per the World Tourism Organisation 2020, within the 2nd quarterly of 2020, all locations across the world have had restrictions placed on travel, therefore bringing an end to global tourism. It therefore weakened the growth of tourism and disrupted global businesses. Further studies are required to counter the negative impacts and ensure the sector continues in the future in particular concerning e-tourism and how newly emerged technologies might help the industry to respond and develop during crisis situations. The sustainability of the tourism industry is crucial and further research needs to be carried out to measure the impact of the pandemic on the future growth of sectors.

COVID-19 also had significant impacts on the global sport industry including airline and hotel cancelations negatively impacting the airline and hotel industries. Data released by UN World Tourism Barometer indicate that international visitor arrivals declined to 700 million from January to October 2020 a 72% drop in visitor arrivals. Aviation faced by 80% of the decline in flights compared to the same period last year. To avoid the spread of the virus, travel restrictions came into place, with super spreader events being cancelled.

The 4IR revolution has been progressively embraced in tourism, particularly during and post the pandemic. The innovation of professional companies employing technical structure has had a significant impact in the sector. Some of the mileage that hotels have attained in hospitality and tourism is inclusion of the hotel's keys to the Apple Wallet. Adoption of these technologies is increasing especially concerning the novel SARS-COV-2 which can impair the productive capabilities of the tourist industries. Even before the world encountered "stay at home, social distance," 4IR technologies were substitute for physical travel.

Virtual reality in tourism refers to the use of 3D technology to depict a users' perspective on real world objects; thus, negating mobility and allowing customers to benefit from places or objects without having to travel to those places. Jobs like Guangzhou are applied in the hotel industry for the service of rooms, delivering the cleaning amenities, and delivering the masks and sanitisers for hands. During the global pandemic, 5G and AI hotel industry applications transformed the sector by utilizing

quick face recognition check-in and payment as well as non-contact body temperature assessment to lessen the possibilities of infection and enhance the traffic rate.[7]

Various governments around the world coupled with the well-established digital structure are employing the 4IR technologies to mitigate and manage the inefficient technologies in the countries such as Belgium, China, France, Germany, Honduras, Italy, Jordan, Kuwait, Poland, Saudi, Singapore, Spain, South Korea, UAE, UK, the US, etc. Each of these nations is embracing 4IR technologies in their tourism industries in its own way and with its own area of emphasis; some are even at the forefront in the adoption.[8] Hence, here are some examples:

- Iceland is the example of sustainable tourism because it applies to the 4IR technologies in the sphere, including in smart energy management and data and AI-based solutions. One of such practices is the ION Adventure Hotel in Selfoss which has an environmentally sustainable approach.[9]
- Smart tourism is being implemented in Spain with 4IR technologies in cities of both Madrid and Barcelona with the purpose of enhancing the tourist experience and destination management with the implementation of the Internet of Things (IoT) sensors for supervision of traffic and control of parking and with the application of AI-powered chatbots for multiple languages of assistance and personalization of the visit.[10]
- Among the areas where Singapore takes the lead in 4IR technology is tourism where Artificial intelligence, as well as big data and Internet of Things, are employed to offer a tailored tour package. Changi Airport of Singapore uses AI-based face identification for border control, and smart hotels/IPOs and attractions offer personalization.[11]
- Japan is transitioning into 4IR techniques to better tourist products like using bots in hotels and airports or virtual/augmented reality to produce lifelike experiences, publicize cultural assets and facilities, provide better services related to tourism. The Fourth Industrial Revolution (4IR) will not lead to smart machines taking human jobs from people, Japan and the World Economic Forum say. Instead, they anticipate a 4IR that give rise to a compassionate, high-tech, human-cantered society.[12]
- After integrating 4IR technologies into its tourist sector, Estonia has become one of the digital champions in electronics and offers easy access. The country’s online bookings, e-visas, e-residencies options are driven by e-Estonia technologies with AI-powered chatbots for global support and individualized recommendations. Countries that give attention to developing

technology regulations have a higher probability of becoming global leaders and competitive players in various technology industries.[13]

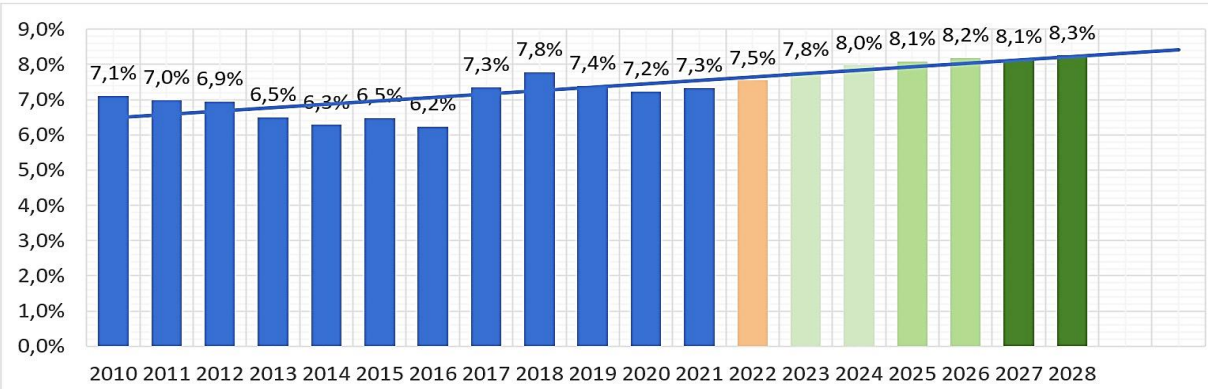
- Such 4IR technologies as artificial intelligence powered chatbots for customer support designed for the United States, personalized travel advice, and blockchain- based travel marketplaces are leading inventions in the global tourism industry. These advancements satisfy the individual's preferences, thus increasing customer satisfaction.[14]

To meet their own needs, resources, and cultural backgrounds, states such as the United States of America are beginning to use these technologies. Travel and destination management will, therefore, be influenced by the development of 4IR technologies.

After independence, tourism has been hindered by the socio-economic and political situation in the country. No systematic approach to tourism has been made; this has resulted in low efficiency. Nevertheless, the field has made big progress in recent years. The study and research of these potential uses and development is significant, as Georgia's diverse tourism potential, including mining, marine, bar, protected areas, and unique ecosystems, is of utmost importance. The state's focus on the tourism sector has resulted in positive factors for its development. Tourist infrastructure has improved, with an increase in international and local visitors. This has created favourable conditions for businesses, employment, and involvement, with a record high of 150,000 people employed. Tourism revenues and state financial revenues have also increased. Georgia's tourism potential has become more attractive, with government support from other countries and significant interest from international organizations, donor organizations, and charitable organizations.[15]

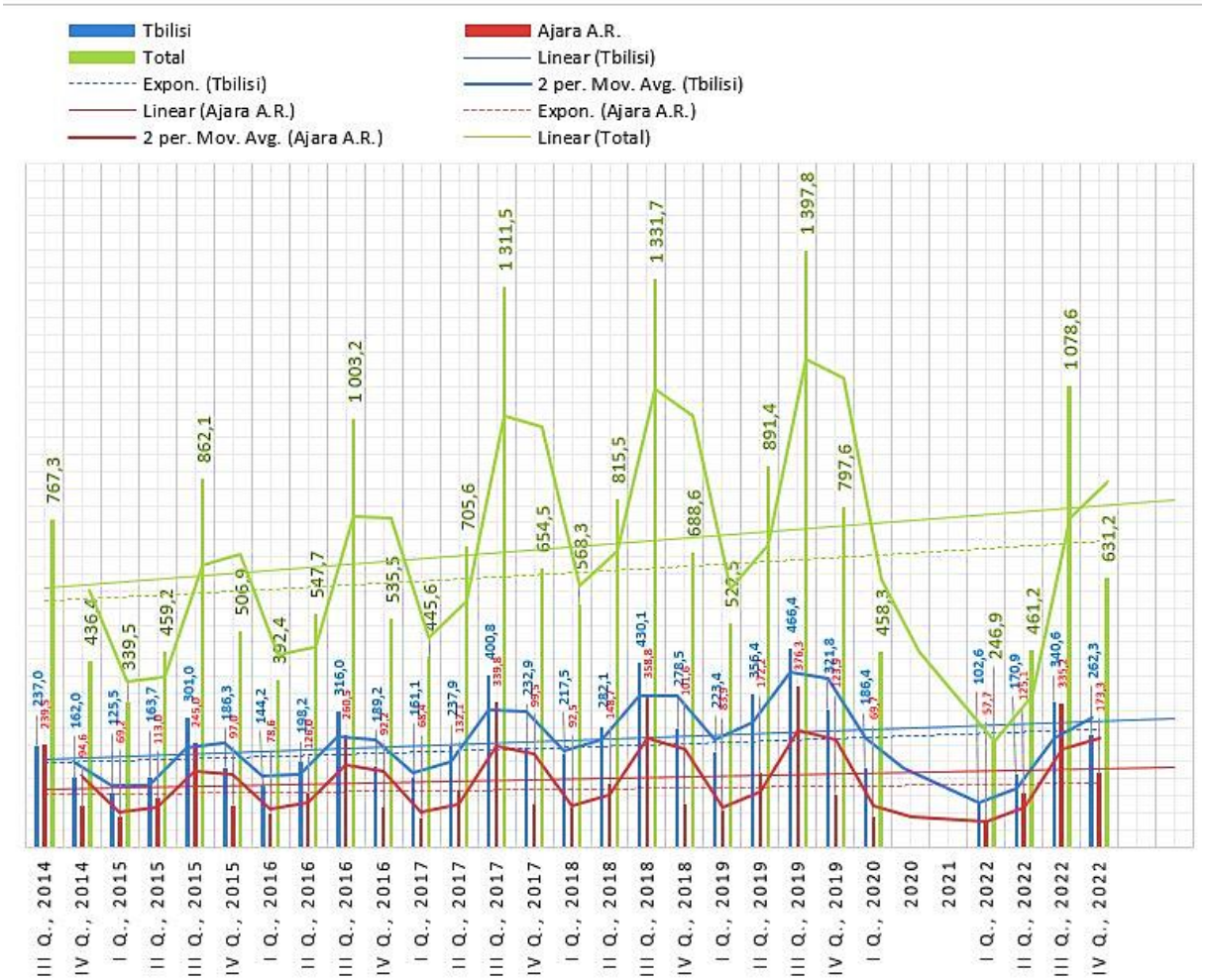
The estimate for the Tourist Sector of Georgia, precisely Tbilisi-Batumi, is taken from data by Georgia's National Statistics Office and Adjara Tourist Department for 2019-2021. The analysis assumes "status quo" conditions, which means there was not a COVID-19 pandemic in the industry. Tourism contributes to 8.3% of Georgia's GDP, compared to Forbes' prediction of 10.5% from 2018 to 2028. The data, having a 1.5% margin of error, shows a positive trend signalling future betterment in Georgia's tourism sector. (Chart N1).[16]

Chart N1: Tourism shares in GDP (ml. GEL)



Source: *National Statistic Office of Georgia (2022)*

Chart N2. Breakdown of an average quarterly number of visits to Georgia by visitors from other countries aged fifteen and older by region visited



Source: *National Statistic Office of Georgia (2023)*

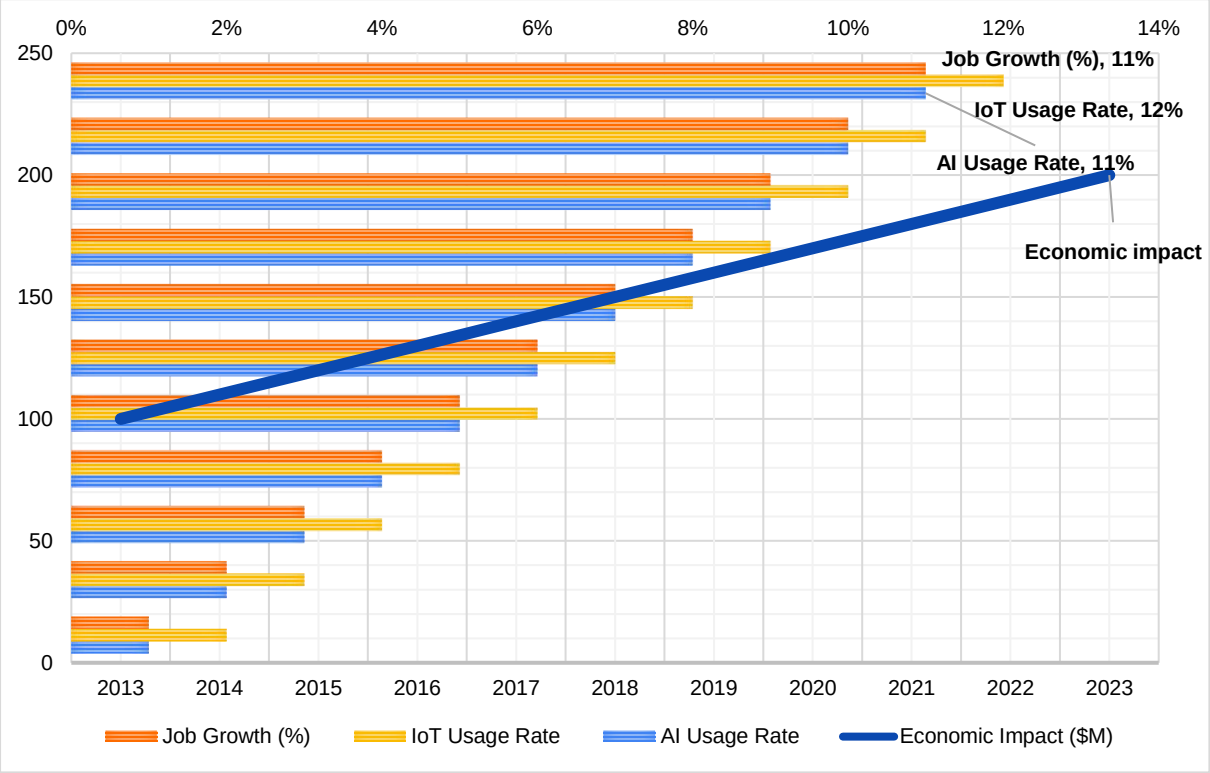
Generally, research results show an overall interest in tourism. Marine tourism, cruise tourism, and extreme tourism are the three priority types. The emerging one is wildlife tourism, which is close

to extreme tourism. These types share similar activities, allowing for extreme tourism enthusiasts to meet their needs using the region's wildlife resources.

Technology usage rate in Adjara tourism sector

According to the Adjara Tourism Development Agency, technology utilization within the tourism sector is high, and 80% of the firms use at least one type of technology. The most used technologies are social media, used by 90% of the firms; booking systems, used by 85% of them; and customer relationship management systems, used by 70%. Other important technologies are the development of websites, electronic tools for marketing, and advertisement platforms. Among a wide array of advantages that the use of technology gives to the tourist industry are. Here are a few concrete instances of how technology is being used in the Adjara tourist sector:

- Hotels: Many hotels in Adjara are using reservation platforms for easy booking procedures. CRM systems are also being applied in the measurement of interactions with clients and management of relationships with customers.
- Restaurants: To make it easy for consumers to purchase their meals, many Adjara cafes use internet ordering services. Companies use an online platform to advertise their company and attract more consumers.
- Tour operators: Many tour operators in Adjara use web development tools to create professionally looking webpages. They also make use of social networking sites to advertise the trips and to attract more people.
- Tourist spots: To make it faster for tourists to buy tickets, some tourist spots in Adjara use an e-ticketing platform. They are also promoting their tourist spots on social networking sites to appeal to more people.



Source: *National Statistic Office of Georgia (2023)*

Conclusions

The Fourth Industrial Revolution (4IR) is a new era of technological innovation that is having a major impact on the tourism sector. The development of 4IR technologies in the tourism sector of Adjara has the potential to create several benefits, such as increased tourism revenue, improved tourist satisfaction, increased job creation, and reduced impact on the environment. The result is that the tourist sector of Adjara, in the ever-changing environment, is on the verge of considerable development. This study analysed the possible development options of the technologies of the 4IR in the Adjara tourist business, giving an insight into the opportunities and issues it confronts in this new era of innovation and digitization.

Engagement of stakeholders is important in realizing the full potential of 4IR within the tourist sector of Adjara. The collaboration between public and commercial sectors, the development of forward-thinking policies, and huge expenditures in human resources are some of the efforts it must entail. The key focus areas for such a strategy would need to be: infrastructure development, education, and training; research and development, and regulatory framework. The combination of these qualities will foster innovation and growth, ensuring that Adjara remains a competitive and sustainable tourism destination.

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PUBLICIST ARTICLE

Contribution of women to the marine industry and marine engineering education in Georgia

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Abstract: Women were rarely employed in the navy. Until 1970, women were not allowed to be admitted to most naval schools. The share of women in the upper echelons of cruise ship service staff was only 5.4%, and in the entire maritime industry, it was 18–20%. [1] Currently, the situation is changing, but there is no talk of gender balance in the military-navy fleet. This article discusses the issues of women's employment in the navy and educational institutions and the dynamics of changing the gender balance through the example of one of the higher naval institutions, the Batumi StateMaritimeAcademy.
keywords: Naval school, Employment of women.

Introduction

Maritime industry in Georgia has a 100-year history. Maritime education is about the same duration. In the 20s of the last century, evening maritime courses were opened in the port of Batumi, on the basis of which the Batumi Maritime Technical College was founded in 1929. By the decision of the Government of the Republic of Georgia in 1992, the Batumi Maritime Academy was established, which also received the status of a Treasury enterprise, the Batumi State Maritime Academy (BSMA), by the decision of the Government of Georgia in 1994. By Resolution No. 184 of October 9, 2009, the current status, face, and name of the Maritime Academy were determined: legal entity under public law: educational university: Batumi State Maritime Academy. Legal Entity of Public Law Teaching University Batumi State Maritime Academy.

Bringing forward positive examples will increase motivation, desire, and confidence that women can make a significant contribution to the development of the field.

Main Text

The participation of women in the history of Georgian seafaring began in the 20th century [2]. In 1936, four girls—Nino Kalandadze, Yulia Failodze, Shushana Tumanishvili, and Vaide Gvarishvili—were enrolled in the Batumi Maritime Technical College.

Yulia Failodze and Nino Kalandadze were employed in the Far East Shipyard. Vaide Gvarishvili and Shushana Tumanishvili were distributed in the Caspian Sea. In November 1942, Yulia Failodze and Nino Kalandadze met by chance in one of the ports of the United States of America. The sight of female navigators excited the American journalists so much that the newspapers printed pictures of Georgian women sailors the very next day.

Fig.1. Four girls in the Batumi Maritime Technical College In 1936.

Yulia Failodze and Nino Kalandadze were employed in the Far East Shipyard. Vaide Gvarishvili and Shushana Tumanishvili were distributed in the Caspian Sea. In November 1942, Yulia Failodze and Nino Kalandadze met by chance in one of the ports of the United States of America. The sight of female navigators excited the American journalists so much that the newspapers printed pictures of Georgian women sailors the very next day.

Nino Kalandadze died in the Barents Sea during a German air raid. Yulia Failodze ended the war as the second assistant captain on one of the largest ships of the Soviet Union, the "Voiko".

We briefly introduce some women working in the maritime field. [5].

Mary Patten temporarily commanded a clipper ship in the 1850s. In July 1856, the Neptune vessel left New York for San Francisco. Captain Joshua Patten was in command, accompanied by his nineteen-year-old pregnant wife, Mary, who had already been on several trips and whose husband had taught her how to navigate.

During the voyage, Captain Patten fell ill. Mary Patten took command with crew support. The ship arrived in San Francisco in November 1856. Mary Patten and her husband returned to New York, where their son was born. Unfortunately, her husband died three months later.

Fig.2. Mary Patten

After her husband, Captain Charles Thorold, died of blood poisoning on board in 1893, Eliza Thorold continued to operate the 44-foot steam tug. He left five young children. Four years in the bay taught her how to handle a boat. She got her license and continued to navigate the ship. By 1900, Eliza had sold the tugboat, and in 1915, she and her son opened an ice cream and candy store next door, which she operated until her death in 1935.

Fig. 3 Eliza Thorold

Rachel Carson was born in 1907 in Pennsylvania. She was a marine scientist by profession. The start of the global environmental movemet is connected with her. It was Carson who was one of the first scientists to show us how much damage we can do to the environment through our activities and that fighting for a healthy environment is really worth it. [4].

Fig.4 Rachel Carson, marine scientist and writer

American programmer and admiral of the Navy. She was one of the first programmers of Harvard's Mark I computer. She is often referred to as "Amazing Grace" due to her many accomplishments.

There are many things that can be said about Grace Hopper, but one interesting fact about her summarizes the state of women in technology accurately - In 1969, the Association for Data Processing Management recognized her contribution under the Male Computer Scientist of the Year category, as there was no separate category for women at the time [3].

Fig. 5. Grace Hopper (1906-1992)

The Batumi State Maritime Academy supports the initiative of international organizations to increase the role of women in maritime affairs and is ready to introduce successful women in the maritime field to a wide audience.

Due to the specifics of the field, even in the 1980s, school teachers were mostly men. Only a few female teachers were employed (T.P. Talakhadze, head of the medical department; Z.E. Kutubidze; L.I. Mazykina; I.V. Skvortsova; E.G. Lukashova) and among them was Rusudan Mikeladze, who taught Georgian language and literature. She was an honored worker of the Navy and an honored teacher of Adjara AR and Georgian USSR.

Currently, there are 76 academicians in the BSM Academy, 36 of whom are women. From 36 women 23 are in the STEM direction (science, technology, engineering, mathematics) [6]. They are involved in the scientific work of the Academy and make their modest contribution to the development of marine science.

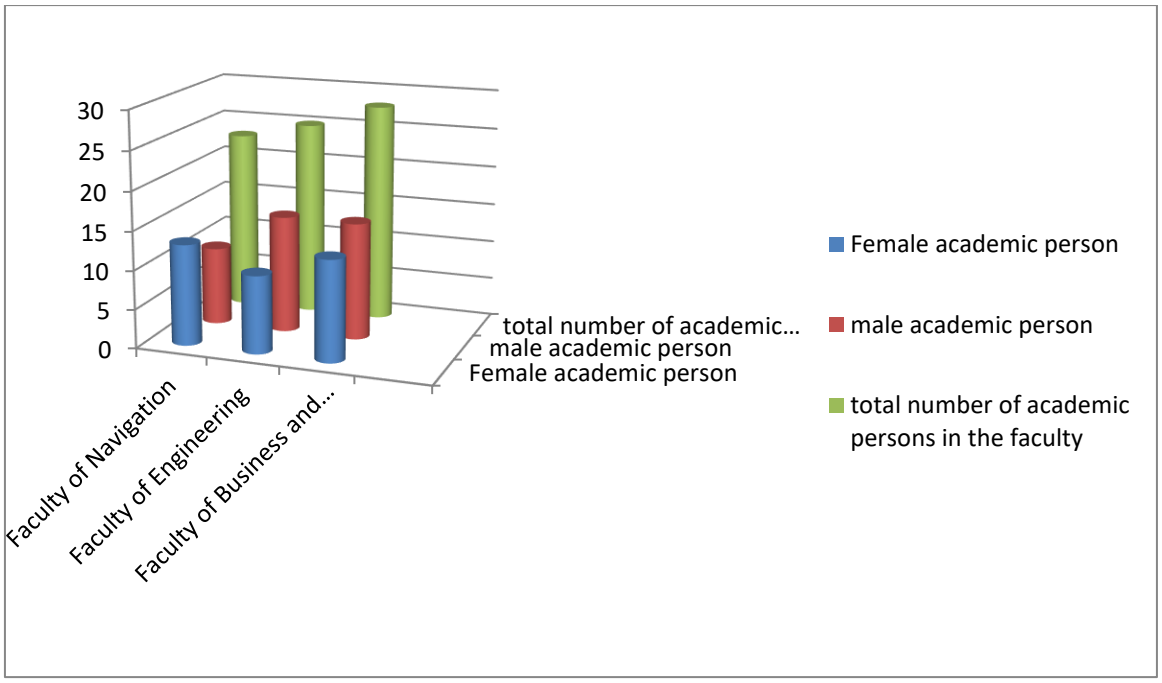

Fig. 6. Gender ratio of academic staff in BSMA

Ladies are actively involved in both pedagogical and scientific work. Among the applicants participating in the scientific-research grant competition in 2019, female researchers performed worthy resistance to male researchers: totally seven projects were submitted, 3 of which were headed by women. Out of 5 winning projects, 2 projects were submitted by females.

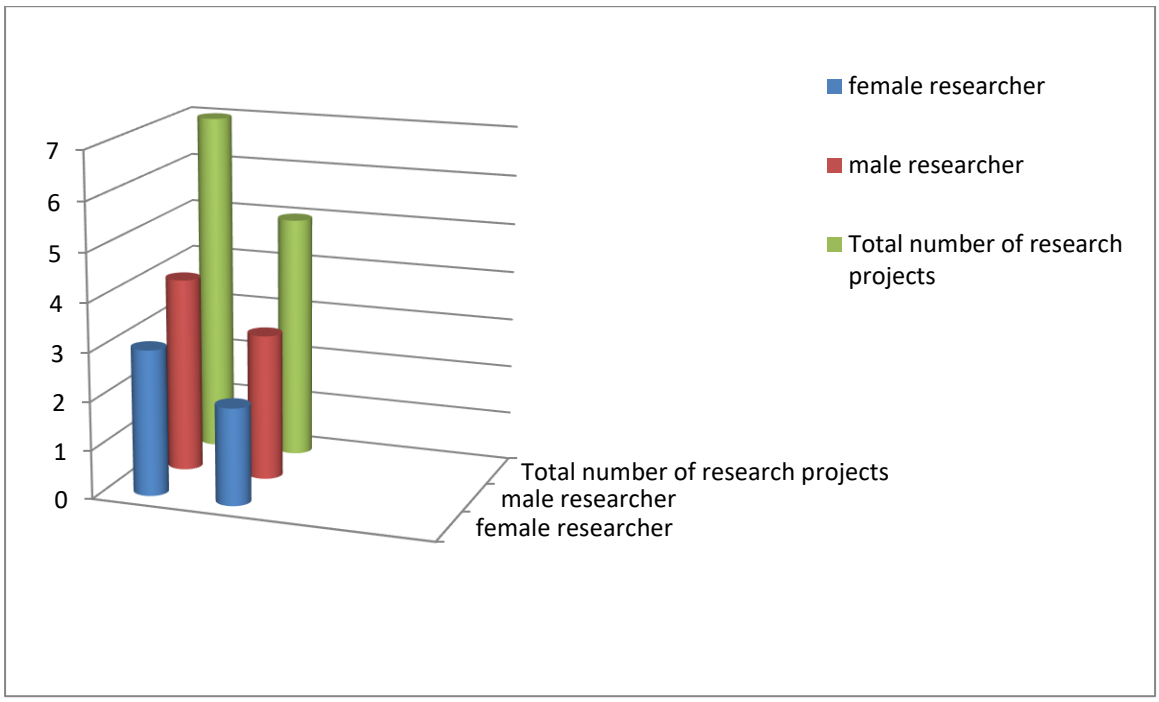

Fig.7. Gender ratio of applicants participating in the scientific-research grant competition at BSMA in 2019

Also interesting is the research conducted among the students of the Faculty of Engineering about the activities of female teachers in technical disciplines. To the questions asked – what is the ratio of female to male teachers according to the teachers in your training courses? How do you feel about female teachers in technical training courses? How is the discipline during the learning process? To what extent is the material being explained supported by practical examples? - For the most part, students noted that it did not matter if the teacher was a woman or a man.

It is worth noting that the interest in studying at the navigation and engineering faculty of BSMA has also arisen from the side of girls. Natia Labadze was the first girl to enter the navigation faculty of the Batumi State Maritime Academy. She is at sea since 2015. Natia is currently the captain's senior assistant. Lusine Tamarian is also a graduate of the Faculty of Navigation at Batumi State Maritime Academy. Lucine Tamarian sails as the third officer. Currently, we have 3 girls in the first year at BSMA navigation faculty; 2 girls in the second course; 3 girls in the third year; 1 girl in the fourth course.

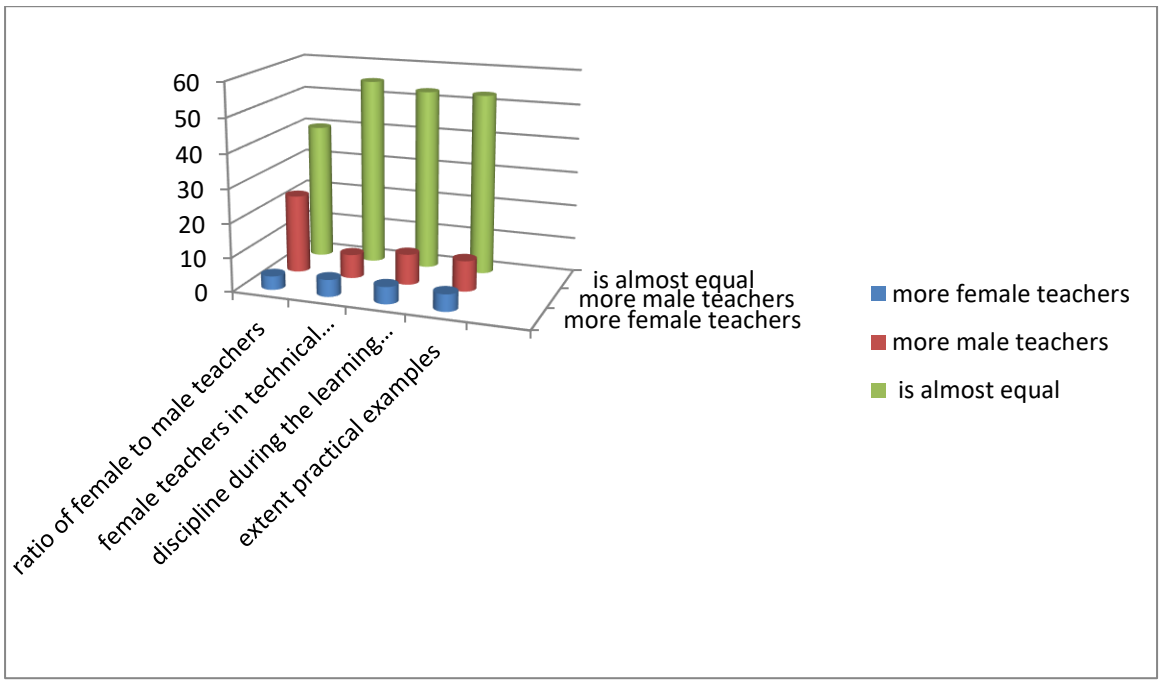

Fig. 8. Answers to questions: 1. What is the ratio of female to male teachers according to the teachers in your training courses? 2. How do you feel about female teachers in technical training courses? 3. What is the discipline during the learning process? 4. To what extent is the material to be explained reinforced by practical examples?

Nowadays, the number of female students in the engineering faculty of BSMA is about 2.5% (18 female students out of 715 students). Currently, a student girl, Mari Gurgenishvili (specialty "Ship Mechanics"), is employed as a cadet in the Navy. Ana Otiashvili is a graduate of the bachelor's program in "Operation of harbors and transporting terminals" and works as a crane operator in Batumi port.

Conclusion

Finally, we will quote Vera Rubin and say that “there is no question in science that can be solved by a man but not by a woman.”

And for those who are still hesitating about whether to choose the maritime field as a future profession, we remind you of Grace Hopper's words: "The ship standing in the port is not in danger, but it is not built for that. You should swim and discover new things".

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