Students' Attitude to Online Emergency Remote Teaching (ERT) at Nikola Vaptsarov Naval Academy and Faculty of Maritime Studies Split during COVID-19 crisis

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COVID-19 pandemic has set new challenges to education systems in the Republic of Bulgaria and in the Republic of Croatia, particularly to higher education systems. In summer semester 2020/2021, emergency remote teaching (ERT) was imposed at Nikola Vaptsarov Naval Academy (NVNA) and at University of Split, Faculty of Maritime Studies (UoS FMS) under the circumstances of the COVID-19 pandemic. As researches related to the students' satisfaction with learning in digital environment at the beginning of the COVID-19 crisis are very rare in Bulgaria and in Croatia, the aim of the paper is to analyse students' attitude to the quality of three-month ERT in specialized compulsory navigation courses at NVNA and at UoS FMS. Anonymous survey on students' attitude was conducted on 154 students majoring in Navigation at NVNA and 98 students majoring in Nautical Studies at UoS FMS. The study revealed that students were generally satisfied with the quality of ERT at NVNA and at UoS FMS. The students' primary concerns regarding ERT (online/hybrid) in navigation courses included the quality of ERT, difficulties with technology, motivation, as well as time management. This useful information can help both lecturers and faculty managements to adapt their teaching strategies and provide adequate support to the students. MET institutions should support students to build skills and behaviours based on students' concerns, but also to train and support lecturers to develop and deliver high-quality hybrid courses. Although the study has limited value, it could be used as a reference point for further studies and should encourage MET institutions, as well as maritime administrations, to give strong support to the implementation of hybrid courses in MET. This study could also inspire maritime administrations to conduct pilot projects on hybrid courses introduction in MET, in line with global trends in education and stakeholders' growing demand for distance learning, without compromising quality of MET.

1. INTRODUCTION

COVID-19 pandemic has set new challenges to education systems in the Republic of Bulgaria and in the Republic of Croatia, particularly to higher education systems. A number of universities and colleges have been forced to solve complex systemic tasks, to restructure class schedules, to introduce and rediscover modern educational technologies, and to adapt the teaching methods. Bulgarian educational system, as well as Croatian educational system, is part of European Union educational system and it is subject to Community rules, taking into account country specifics.

At a time of unclear perspective on how to conduct classes in the new academic year, emergency remote teaching (ERT) has become a relevant solution. ERT was imposed in the circumstances of the COVID-19 pandemic in the summer semester 2020 at Nikola Vaptsarov Naval Academy (NVNA) and the University of Split, Faculty of Maritime Studies (UoS FMS). Lecturers and students had to participate in online courses without prior targeted training. The new situation and the new relations between students and lecturers, established by the rapid introduction of ERT at both institutions and declared state of emergency in both Bulgaria and Croatia, provoked the authors to explore the attitudes of students at NVNA Department of Navigation and at UoS FMS Department of Nautical Studies.

As the researches related to the students' satisfaction with learning in digital environment at the beginning of COVID-19 crisis in Bulgaria and Croatia are very rare, the aim of the paper is to analyse the students' attitude to the quality of three-month ERT in specialized compulsory navigation courses at NVNA and at UoS FMS. It should be emphasized that this is the first study conducted among the students at maritime high education institutions in Bulgaria, as well as in Croatia.

2. LITERATURE REVIEW

Distance learning (DL) is form of education in which the main elements include physical separation of teachers and students during instruction and the use of various technologies (Simonson & Berg, 2001). DL has traditionally focused on non-traditional students (part-time students, non-residents,), but COVID-19 pandemic has forced the educational systems to implement DL for various types of students.

E-learning could be considered a natural evolution of distance learning, and the term e-learning has frequently been substituted by others, such as computer based learning, technology-based training, and computer-based training, which actually predate the first mention of e-learning or the more recent online learning (Sangra et al., 2012). According to Valverde-Berrocoso et al. (2020) and Aparicio et al. (2016), 23 concepts have been identified that belong to the use of computers for learning purposes (online learning, distance education, etc.). According to Moore et al. (2011), the origins of the term e-learning is not certain, although it is suggested that the term most likely originated during the 1980's, within the similar time frame of another delivery mode of online learning. According to Erlam et al. (2021), the terms emergency remote teaching (ERT) and online teaching and learning have both been used in the context of the pandemic event. ERT is a temporary shift of instructional delivery to an alternate mode due to crisis circumstances (Hodges et al., 2020). It involves the use of fully remote teaching solutions for instruction and education that would otherwise be delivered face-to-face or as blended courses, while online learning is both a social and a cognitive process (Conole, 2021), not merely a matter of information transmission via remote information technologies (Erlam et al., 2021). It is important to note the distinction between ERT and online learning – namely, ERT involves transforming on-site classes to a virtual mode, without making changes to the curriculum or the methodology (Farnell et al., 2021). As the context in Bulgarian and Croatian education systems is more similar to ERT than to online teaching and learning, the term ERT has been used throughout the paper.

As the world enters a second year living with the COVID-19 pandemic, half of the global student population is still affected by full or partial school closures. In order to avoid a generational catastrophe, UNESCO is prioritizing education recovery as highlighted in a high-level ministerial meeting in March 2021. One of the topics is Digital transformation and the future of education that has emerged as concerns in every country and one of the most important questions is: How has COVID-19 impacted the future of education? (UNESCO, 2021).

Accessibility, affordability, flexibility, life-long learning are some of the up-sides related to DL, but also technical difficulties, lack of community, lack of two-way interaction, boring and unengaging theoretical teaching, lack of student practice are some of the down-sides related to DL (Dhawan, 2020). According to Boulougouris et al. (2019), a number of empirical studies have examined the quality of online courses and found that critical issues affecting the quality of online education include communication, technology, time management, pedagogy, assessment, the higher number of dropouts (Bassoppo-Moyo 2006; Conaway et al. 2005; Limperos et al. 2015; Kebritchi et al. 2017). However, there is still no clear opinion on how DL is perceived by students and teachers.

In maritime education and training (MET), attempts have been made to replace traditional forms of teaching with distance learning for a long time. According to Pipchenko & Kovtunenko (2020) the rapid growth of technologies, constant aspiration to increase the level of automation, strictness of regulations and operations efficiency dictate the necessity to apply new methods in teaching/learning process, such as e-learning, conventional

classroom teaching, on-job learning in a harmonized manner. Many educational institutions around the world have been implementing the aspects of distance learning into educational programs for the last 15-20 years, and MET institutions are following the global trends in educational developments and Computer-based training (CBT) has been a standard for the marine industry for 25 years, preceded by the famous Videotel instruction videos as the first attempt to distant learning and training (Pipchenko & Kovtunenko, 2020).

Bachelor's degree maritime education and qualification training are subject to strict international rules, laid down in the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) Convention. The International Maritime Organization (IMO) set out the principles for Lifelong Learning Program through amendments to STCW Convention, periodically requiring seafarers to provide evidence of maintaining and upgrading their competences by participating in courses and seminars. Such form of training must be carried out under the supervision of the public authorities responsible for the maritime training process. The Manila amendments to STCW Convention and Code were adopted on 25 June 2010. Amongst the amendments adopted, there are a number of important changes to each chapter of the Convention and Code, including the introduction of modern training methodology including distance learning and web-based learning (Part C section B-I/6 of the Code Recommended Competencies) (IMO, 2021). Section B-I/6 of STCW code contains guidance for training by distance learning and e-learning, stating that governments should ensure that any distance learning and e-learning programme:
- is provided by an entity that is approved by the Party;
- is suitable for the selected objectives and training tasks to meet the competence level for the subject covered;
- has clear and unambiguous instructions for the trainees to understand how the programme operates; etc.

IMO Model course 6.09 Training course for the instructors specifies several remote teaching methods, such as Computer-based teaching, Distance learning/E-learning, and Massive Open Online Courses (MOOC). (Pipchenko & Kovtunenko, 2020).

The European Union (European 4th Framework Programme) funded training projects that support DL in MET such the SEAGULL Project Long Distance Learning Technologies in Maritime Education and Training. The overall objective of the SEAGULL Project was to assess the impact on costs and the effectiveness of long DL technologies in MET. It was imperative to involve nautical institutions and to establish links between them in order to define the contents of the syllabi and to develop a common strategy in line with relevant international (IMO) instruments and EC directives. (TRIMIS, 2021) During the SEAGULL project, four Maritime Long Distance Learning (MLDL) courses were developed and tested. The assessment demonstrated that MLDL training effects are comparable with conventional and typically more expensive training, that users accept MLDL, and that the costs are well below costs associated with conventional training, but there is a greater training effect when conventional and MLDL courses are combined. Lessons learned during the implementation and delivery of the courses point to a number of constraints and requirements on organisational and technical issues. The delays and problems experienced were in large part due to the fact that each of the courses was a new product and therefore, that our host organisations were launch customers. (TRIMIS, 2021)

There are many published papers on application of DL in MET, and many papers show the authors' enthusiasm for the application of a new concept that would break the dogmas in the existing system of maritime education and qualification (Tan, 1999; Bauk & Radlingera, 2013; Chen et al. 2017; Jiang & Li, 2017), but also disadvantages of DL application in MET, such as: lack of face-to-face communication between student and teacher, overconfidence in technology, inability to organize MET for large groups of students and teachers (Kirkood, 2000; Khattab & Attar, 2012). One of the challenges that the distance learning may pose to competence-based MET is meeting the requirements of STCW, in addition to the issue on quality assurance (Swapp, 2001). According to Jiang & Li (2017) as current practice in MET, distance learning is not applicable and popularized for mandatory certification of seafarers due to the lack of approved training facilities, approved examination and assessment systems and quality standards system to control the MET activities. The authors recommend that the crafting of distance education program in competence-based MET needs much careful planning and designing and continuous quality monitoring, also and also suggesting:
- improvement of the legal framework that allows certification and examination system under distance education in MET;
- promotion of international cooperation between MET institutions;
- establishing a lifelong distance education platform with various and quality courses.

According to Chen et al. (2017), MET must conform to the trend of times to explore e-learning training to improve the training performance, in order to solve the problems of shortage of qualified teachers and relatively high costs of training in the world. E-learning can hire highly experienced instructors to provide high-quality and relatively inexpensive courses that address both the high level of teacher shortage and the high tuition fees, but also E-learning can better meet the needs of seafarer knowledge update (Chen et al. 2017).

The concept of DL has already been introduced in the laws and regulations of Bulgarian ministry of Education and Science, as well as in the regulations of higher education institutions (HEI). Ordinance on the state requirements for the organization

of distance learning in higher education institutions, adopted in November 2004, regulates the state requirements for the organization of distance learning in higher education institutions on the Republic of Bulgaria. In 2021, a new Ordinance on state requirements for organizing distance learning in higher education has been developed and adopted (in force since September 1, 2021). The new Ordinance allows higher education institutions to organize distance learning and to improve the qualification of specialists with higher education, as well as to continue the additional professional training and regulate remote teaching and remote final state examinations, as well as videoconference defence of diploma theses (Zahariev et al., 2021). The state requirements, presented to the academic community in Bulgaria by the Ministry of Education and Science, have long-term horizons – 2030. Bulgaria has devised its National Development Programme, or BULGARIA 2030, as its main strategic document in all sectors of government, including education, research and innovation (R&I) (Euraxess, 2021). National priorities in research are incorporated through the funding programmes of the Bulgarian National Science Fund and the operational programme (OP) Science and education for smart growth, which support the development and modernization within the thematic areas of the Bulgarian Innovation Strategy for Smart Specialisation. This strategy covers mechatronics and clean technologies, informatics and ICT, industry and healthcare and biotechnologies, as well as the creative and recreative industries. Given the strategic importance of the topic, all EU Member States, including Bulgaria, signed the Declaration of Cooperation on Artificial Intelligence (AI) on Digital Day 2018, the Bulgarian science. The timeline of this process, however, is unclear as the topic is quite complex and sensitive, especially when it comes to education. (Euraxess, 2021) Despite the criticism against today's DL quality in high education at universities in Bulgaria, Lyubenova and Lyubenov (2019) state that DL quality will be improved due to computer literate students, as well as computer literate university professors in future. The pandemic COVID-19 has affected all the activities and completely discontinued them in many areas. As regards social psychic health, the major psychological consequences now are related to increased stress, anxiety, and depression due to the self-isolation and lack of normal activities. Iancheva et al. (2020) conducted an in-depth study on dominant psychic conditions and coping strategies of specific groups of learners - sports students from Bulgaria and Russia during the pandemic COVID-19. The research showed that the pandemic and social isolation did not have strong negative impact on the mental state of the students. The students tried to get the positive out of the situation, to learn something new, to restructure their goals. The authors posed the question about the intercultural comparisons in the reactions in the emergency situation with COVID-19. The comparative analysis along the factor of nationality revealed significant cross-cultural differences. Bulgarian students had higher values for the adaptive and lower values for the maladaptive perfectionism and more strongly expressed depression symptoms, but were more motivated and energetic in the current situation. (Iancheva et al., 2020)

In Croatia, the Croatian Academic Network (CARNET) launched the pilot e-Schools project in 2015. The main outcome of the successfully finished project was increased level of digital maturity in 10 % of Croatian schools. By introducing the ICT infrastructure and equipment to 151 Croatian schools, the development of digital contents, e-services and tools for teaching and business processes, as well as continuous training increased digital competence of school staff (CARNET, 2018). In 2016, Croatia started the curricular reform in school education, and the reform has been particularly focused on improving students' and teachers' digital competences since 2017. During the COVID-19 crises in 2020, Higher Education Institutions (HEIs) received guidelines from Ministry of Science and Education of the Republic of Croatia (MSERC) on how to transfer to DL, including guidelines on: Internet access and devices, Work of employees during distance teaching, as well as Virtual contents and organising classes. During the first two weeks of DL, the emphasis was on psychological support to students and topical guidelines for other stakeholders in the system. In order to prevent imbalances in student workload, MSERC published the document Recommendations for organizing students' work. In order to support the development of 21st century competences rather than to promote fact learning, MSERC published the Guidelines for assessment and grading in a virtual environment, focused on determining and evaluating the importance of a specific content. Concerning higher education, the HEIs were able to determine autonomously how DL would be implemented in practice, while University Computing Centre SRCE provided software and support through its DL Centre. The results of the questionnaire that MSERC conducted with the HEIs in Croatia demonstrated that the majority of higher education institutions (80 %) implemented study programmes by using different digital tools, and that some modules were more challenging for DL, in particular work-based learning or work in laboratories. The results revealed that the majority of HEIs in Croatia have already set up assessment procedures. (MSERC, 2020a)

The early surveys, conducted at the very beginning of the COVID-19 crisis, were mainly focused on the HEIs' immediate response to the pandemic outbreak, i.e. they aimed at establishing whether campuses were closed, and classes cancelled, and to what extent, or moved online, and to what extent (Farnell et al., 2021). In the paper Croatian experience of distance learning at the beginning of the public health crisis caused by COVID-19, Bagarić et al. (2021) states that only 20 % of higher education classes took place remotely, while the remaining 80 % were postponed during the first two weeks of the lockdown in March 2020 in Croatia. The level of readiness and

experience of lecturers and students with DL was very divergent in the Croatian higher education institutions. DL is generally considered as a supplement to face-to-face learning and not real classes among students (Katavić et al., 2018). The Croatian Agency for Science and Higher Education (ASHE) conducted the research, entitled Challenges in Higher Education during the COVID-19 pandemic and social isolation: experiences and needs of staff members and students at higher education institution. The data was collected during June and July 2020 through an online survey, in which staff members and students from higher education institutions throughout Croatia participated. Lecturers and students faced numerous challenges, such as the lack of didactic, technological, and socio-psychological assistance and support at all levels. The students also expressed needs for stable internet connection, appropriate computer hardware, and additional equipment, access to digital literature, better organisation of online exams, and the prevention of unethical behaviour, face-to-face laboratory exercises, the development of uniform online teaching guidelines, psychological counselling services, additional training for teachers on existing forms of online communication, and other. (ASHE, 2020). The entire Croatian higher education system has switched overnight from the predominantly face-to-face learning to online DL, due to great personal effort and motivation of all stakeholders and with the help of official guidelines Communication from the Commission to the European Parliament and the Council on Education in Emergencies and Protracted Crises (EC, 2018) and Recommendations for undergraduate, graduate, and postgraduate learning at universities regarding the COVID-19 epidemics (MSERC, 2020b).

3. MATERIAL AND METHODS

3.1. Research Questions

The research studies related to the quality of teaching and learning in digital environment at the beginning of COVID-19 crisis in Bulgaria and Croatia are very rare. In order to investigate the quality of three-month ERT in specialized compulsory navigation courses at NVNA Department of Navigation and at UoS FMS Department of Nautical Studies, the pilot study on students' attitude was conducted. Although the research was focused on ERT, the term online learning/DL was used in the questionnaire because the term ERT was not commonly used in Bulgaria and in Croatia, therefore it would have been unfamiliar to the participants. The results of the questionnaire were sent to the lecturers of the Department of Navigation at NVNA/the Department of Nautical Studies at UoS FMS in order to improve organization of online classes in the academic year 2020/2021.

3.2. Data Collection Methods and Instruments

In order to analyse the students' attitude to the quality of three-month ERT in specialized compulsory navigation courses at NVNA and at UoS FMS, as well as the student satisfaction with ERT, an appropriate tool for collecting information – online survey (questionnaire) was created in Google Forms. An online anonymous survey was created, consisting of six closed questions (in Appendix) and multiple-choice structured answers. The survey was inspired by similar studies on students' opinion in Bulgaria (Iacheva et al., 2020), in Croatia (ASHE, 2020), worldwide (Fidalgo et al, 2020), as well as on the studies on maritime students' opinion on MET ERT worldwide (Ochavillo, 2020). The survey questions were created in order to respond to research questions that guided this study, and multiple-choice structured answers were based on general issues and concerns related to ERT. Since English is the standard language in maritime industry, the survey was written in English. The URL for the survey was e-mailed to students by their instructors. The survey was conducted after three months of ERT and the subsequent exam period from the mid-March 2020 to the end of June 2020, at NVNA and from the mid-March 2020 to the mid-July 2020 at UoS FMS.

3.3. Data Analysis Procedures (Including Statistical Tests)

The research used the method of interview via preliminary created questionnaire in Google Forms for collecting the necessary data. Survey results were recorded in Google Forms and an Excel spreadsheet was used to collect students' responses. The comparative analysis of percentage shares of students' attitude to six questions posed in the survey (percentage of chosen answers) was conducted. Descriptive statistics of the students' answers are presented in graphs/pies with percentages of responses displayed. The descriptive statistics provide summaries of the answers, as well as measures of variability (or spread) and central tendency (Fidalgo et al., 2020).

Chi-square statistical test ($\chi 2$) was performed to test the relationship between two categorical variables in the population:

$$\chi^2 (df, N) = \frac{\sum_{ij=1}^{k} (o_{ij} - e_{ij})^2}{e_{ij}} \tag{1}$$

where df represents a degree of freedom, N is the number of observed data, o_{ij} is observed data, and e_{ij} is expected data (Pearson, 1900). Crombach's alpha test ($c\alpha$) was performed to determine the internal consistency of data (Cronbach, 1951).

3.4. Setting

The NVNA is a part of Bulgarian higher education system and the UoS FMS is a part of Croatian higher education system. Both institutions follow the national trend of ERT introduction in the education process, also complying with IMO conventions and codes. The Academic Council of NVNA voted for a change of education regulations and adopted Protocol on DL on 23. June 2011. NVNA has institutional accreditation for education and training in the so-called regulated and unregulated specialties. The regulated specialties Navigation, Electrical equipment of the ship, Ship power plant and Ship radio electronics are subject to The Decree of the Council of Ministers of the Republic of Bulgaria № 59 (adopted on 17 March 2015). The education in the special field of Navigation is divided into: initial maritime education and subsequent qualification training.

3.5. Participants

At NVNA, the survey included second-year and third-year students majoring in Navigation (207 students in total), but only 154 students responded to the survey, including 13 female students and 80 foreign students. The foreign students were released after the emergency declaration in the state and they could choose between returning home and staying in Bulgaria. Most of them chose to leave, which subsequently created problems with the quality of internet connection. At UoS FMS, 98 students majoring in Nautical Studies were included in the survey.

4. RESULTS

The majority of the students (72.1 % at NVNA and 53.1 % at UoS FMS) have never taken ERT (online/DL) or hybrid courses before (Figure 1). A test of independence was calculated comparing two institutions (NVNA and UoS FMS): $\chi2(2, N=154)=9.958$ with CV=5.991 and p<0.01 (0.00688). It can be concluded there is a statistically significant association between these two institutions concerning survey question: Have you ever taken online or hybrid courses before? Furthermore, Crombach's alpha test ($c\alpha=0.76$) indicates an acceptable internal consistency between the data obtained from the two institutions.
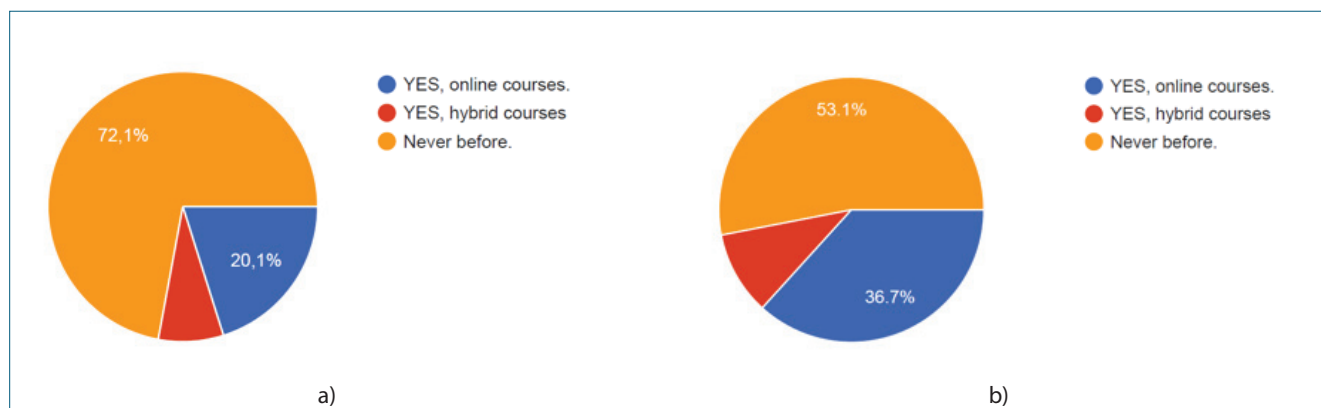

Figure 1.
Students' answers to the question: Have you ever taken online (DL) or hybrid courses before? a) NVNA, b) UoS FMS.

Figure 2. shows students' attitude to the relation between high quality training/education in navigation courses (including all navigation courses, not only subjects that include simulator training) and traditional classroom lessons.

24 % of the students at NVNA and 27.6 % of the students at UoS FMS think that high quality education in navigation courses cannot be achieved without traditional classroom lessons, while 12.3 % of the students at NVNA and 17.3 % of the students at UoS FMS think that high quality education in navigation courses can be achieved without traditional classroom lessons because they believe if they miss something in class, they will catch up later in on-board practice. The majority of the students (63.6 % at NVNA and 55.1 % at UoS FMS) think that high quality education in navigation courses can be achieved in hybrid teaching - all practical exercises that require specialized equipment, such as simulators, laboratory instruments, navigation charts and tablets should take place in class. A test of independence was calculated comparing the two institutions (NVNA and UoS FMS): $\chi2(3, N=154)=2.502$ with CV=7.814 and p>0.05 (0.474). It can be concluded there is no statistical association between these two
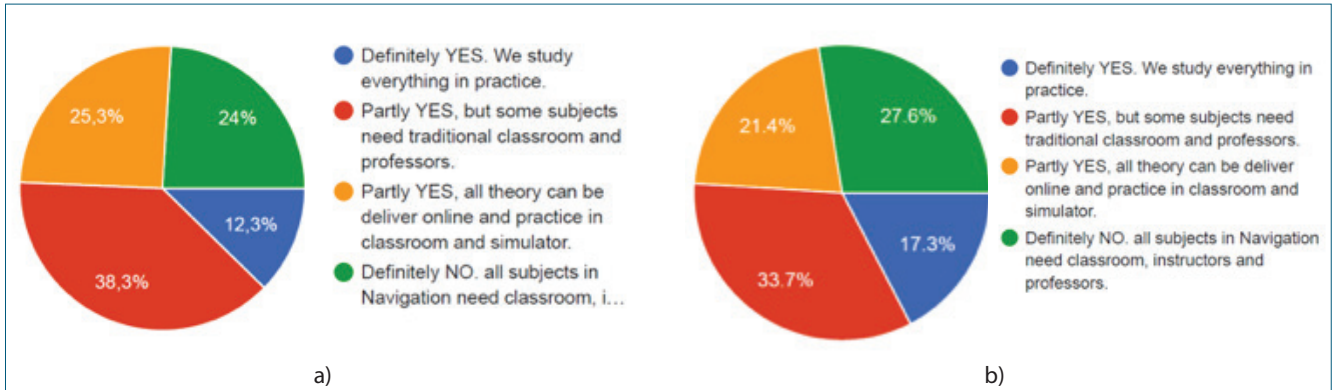
Figure 2.
Students' answers to the question: Can high quality education in navigation courses be achieved without traditional classroom lessons?: a) NVNA, b) UoS FMS.

institutions concerning the survey question: Can high-quality education in navigation courses be achieved without traditional classroom lessons? Furthermore, Crombach's alpha test (cα=0.78) indicates an acceptable internal consistency between the data obtained from the two institutions.

Figure 3 shows students' grading (from 1 - extremely bad to 10 - extremely good) of overall DL (ERT) experience in specialized compulsory courses in the Department of Navigation at NVNA and in the Department of Nautical Studies at UoS FMS during the summer semester 2019/2020.
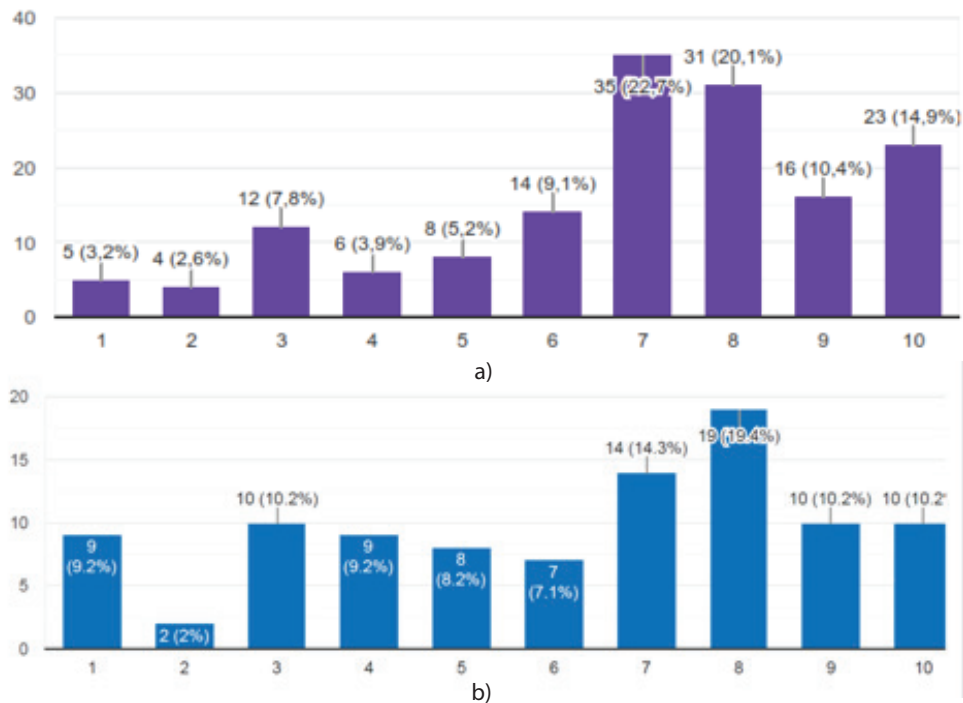

Figure 3.
Students' grading (from 1 - extremely bad to 10 - extremely good) of overall DL experience in specialized compulsory courses in the Department of Navigation during the summer semester 2019/2020: a) NVNA, b) UoS FMS.

At NVNA, 119 students (77.2 %) graded overall ERT (online/DL) experience during the summer semester 2019/2020 higher than 5, while 60 students (61.2 %) graded overall ERT (online/DL) experience during the summer semester 2019/2020 higher than 5 at UoS FMS. Grade 7 was the most frequently chosen grade at NVNA (35 students or 22.7 %), and grade 8 (19 students or 19.4 %) was the most frequently chosen grade at UoS FMS. A test of independence was calculated comparing the two institutions (NVNA and UoS FMS): $\chi2(9, N=154)=11.43$ with CV=16.918 and p>0.05 (0.247). It can be concluded there is no statistical association between these two institutions concerning the student grading of overall DL experience in specialized compulsory subjects in the Department of Navigation during the summer semester 2019/2020. Furthermore, Crombach's alpha test (cα=0.71) indicates an acceptable internal consistency between the data obtained from the two institutions.

68.8 % of the students at NVNA and 66.4 % of the students at UoS FMS agreed that they were comfortable with the working environment at home (Figure 4). However, 16.9 % of students at NVNA and 14.3 % of the students at UoS FMS were not comfortable with video surveillance in online learning, while 18.2 % of the students at NVNA and 26.5 % of the students at UoS FMS could not concentrate well at home. A test of independence was calculated comparing the two institutions (NVNA and UoS FMS): $\chi2(4, N=154)=4.431$ with CV=9.487 and p>0.05 (0.35). It can be concluded there is no statistical association between these two institutions concerning the survey question: Are you comfortable with the working environment at home? Furthermore, Crombach's alpha test (cα=0.86) indicates a good internal consistency between the data obtained from the two institutions.
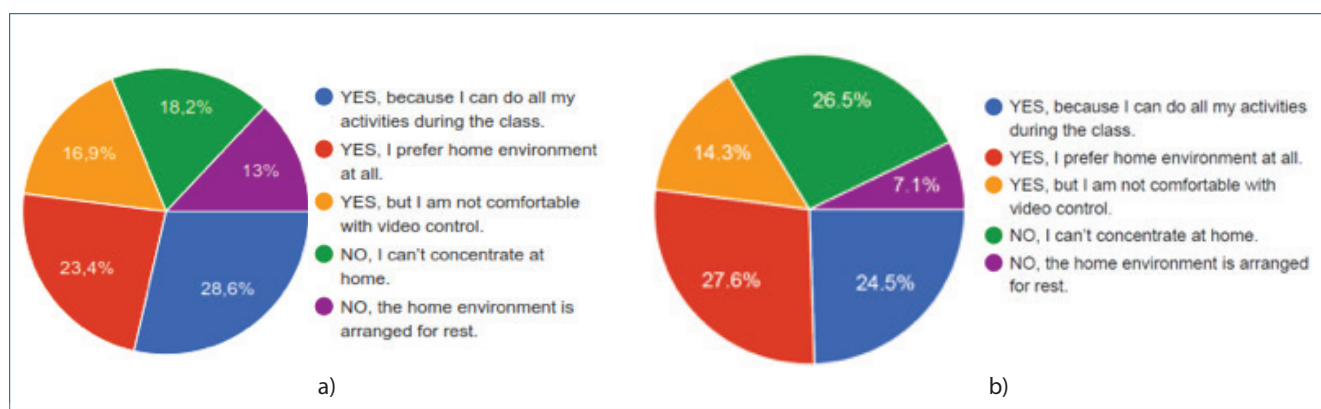

Figure 4.
Students' answers to the question: Are you comfortable with working environment at home?: a) NVNA, b) UoS FMS.

Figure 5. shows the students' answers to the question: What do you consider to be the greatest benefit of online courses (DL)? The great majority of the students at NVNA (85.1 %) and the great majority of the students at UoS FMS (86.7 %) answered that the greatest benefits of ERT (online/DL) were time saving and the flexibility of the classes. A test of independence was calculated comparing the two institutions (NVNA and UoS FMS): $\chi2(4, N=154)=59,08291$ with CV=9,487729 and p<0.05 (4,52E-12). It can be concluded there is a statistically significant association between these two institutions concerning the survey question: What do you consider to be the greatest benefit of online courses? Furthermore, Crombach's alpha test (cα=0.63) indicates a questionable internal consistency between the data obtained from the two institutions.

Figure 6. shows the students' answers to the question: What do you consider to be the biggest challenge in online courses (DL)?

Almost half of the students (45.5%) at NVNA and 39.8 % of the students at UoS FMS answered that the quality of ERT (online/DL) was the biggest challenge. At NVNA 19.5 % of the students answered that difficulties with technology were the biggest challenge of ERT (online/DL), (compared to 13.3 % at UoS FMS), while 11 % of the students answered that the biggest challenge was to stay engaged (compared to 14.3% at UoS FMS). At UoS FMS 16.3 % of the students answered that the biggest challenge was time management compared to 7.1 % students at NVNA. A test of independence was calculated comparing the two institutions (NVNA and UoS FMS): $\chi2(4, N=154)= 7,132036$ with CV=11,0705 and p>0.05 (0,211). It can be concluded there is no statistical association between the two institutions concerning the survey question: What do you consider to be the biggest challenge in online courses? Furthermore, Crombach's alpha test (cα=0.86) indicates a good internal consistency between the data obtained from the two institutions.
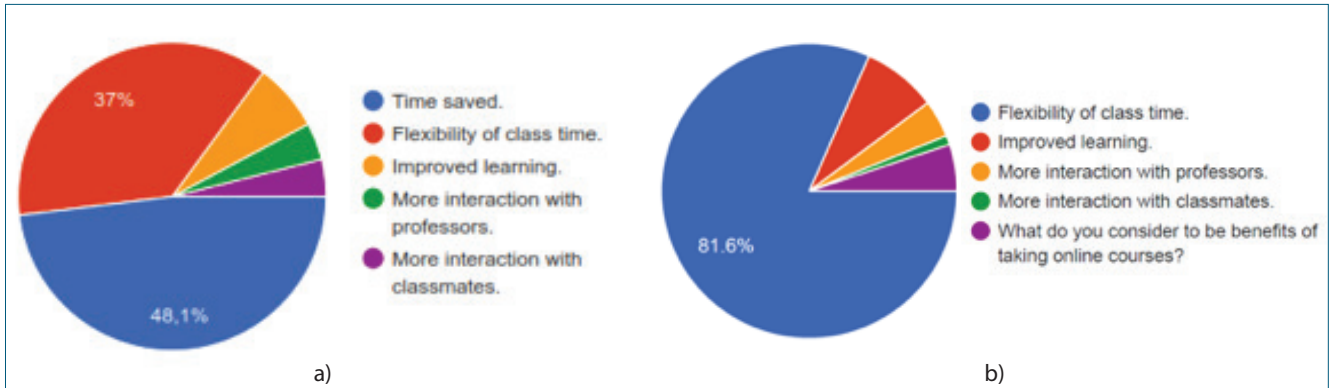
Figure 5.
Students' answers to the question: What do you consider to be the greatest benefit of online courses (DL)?: a) NVNA, b) UoS FMS.
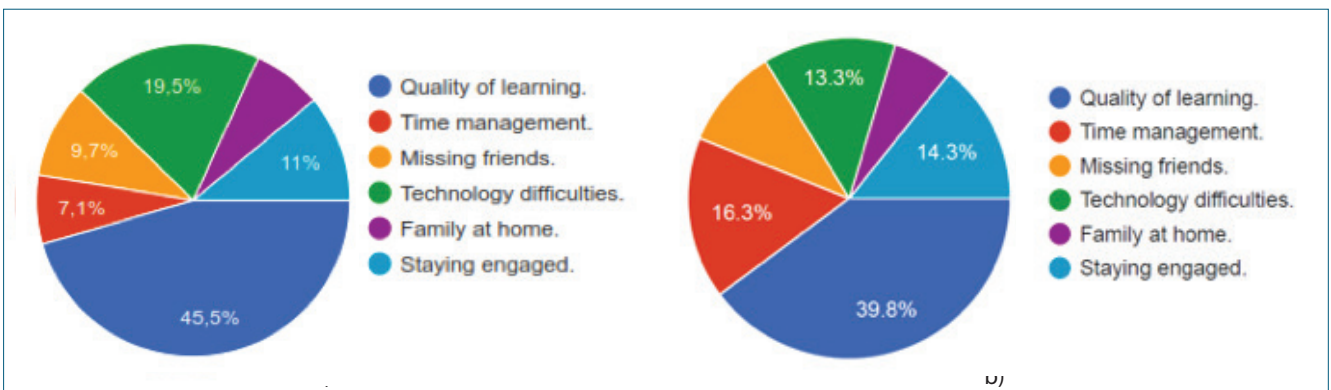

Figure 6.
Student answers to the question: What do you consider to be the biggest challenge in online courses (DL)?: a) NVNA, b) UoS FMS.

5. DISCUSSION

The results of the survey showed that almost 3/4 of the students at NVNA and more than 1/2 of the students at UoS FMS had never taken online (DL) or hybrid courses before, but the lack of students' experience in online learning at NVNA was quickly overcome by better organization and support provided by experts from the Department of Cybernetics. Constant support of IT experts is very important in order to ensure good quality of ERT. The percentage of the students that had previous experience in online (DL) or hybrid courses could be compared with the results of online survey on the influence of exceptional circumstances on the experience of studying conducted by The Croatian Agency for Science and Higher Education (ASHE) during June and July 2020, (ASHE, 2020). According the ASHE (2020), the majority of 1,114 students from Croatia higher education institutions (even 82 %) were satisfied and very satisfied with the level of their

own digital competencies, but the students expressed concern about a stable internet connection, appropriate computer hardware, better organization of online exams, and prevention of unethical behaviour, the possibility to carry out part of the teaching (especially the practical part) in person, psychological counselling services, additional training for teachers on existing forms of online communication, and other.

More than 3/4 of the students at NVNA and almost 2/3 at UoS FMS graded overall ERT experience during the summer semester 2019/2020 with a grade higher than 5. At NVNA, grade 7 was the most frequently chosen grade, while grade 8 was the most frequently chosen grade at UoS FMS. Various objective factors (the organization of ERT course, teachers digital competences, technical problems,…) and subjective factors (working environment, students attitude to ERT,…) can influence the students' satisfaction with ERT. According to Kebritchi et al. (2017), the learners' adherence to attend online courses is greatly

affected by their self-motivation, their information technology (IT) skills related to the use of computers and the Internet, their perceptions and attitudes towards the Internet, and their cultural and non-English background. Therefore it is very important to provide constant and adequate support to the students in order to help them to solve objective but also subjective problems connected with online/hybrid teaching/learning.

Over 4/5 of the students at both institutions answered that time saving and the flexibility were the major benefit of ERT. This is in accordance with the results of Boulougouris et al. (2019) that one of the major benefits of online learning in MET is that it provides great flexibility and autonomy to the learners.

Almost 1/2 of the students at NVNA and over 1/3 of the students at UoS FMS answered that the quality of ERT was the biggest challenge, especially the organization of practical training at both institutions. In order to solve this problem, the institutions should provide constant and adequate support, not only to the students but also to the lecturers. The lecturers should also take an initiative and work on the improvement of teaching methods and strategies. According to Dhawan (2020), problems associated with online teaching and learning are: technical difficulties, lack of two-way interaction, boring and unengaging theoretical teaching, lack of student practice, learning flexibility connected with student self-discipline problems or student e-literacy: these problems were also detected at both institutions. Taking these possible causes of students' challenges, associated with online teaching and learning, into account, the importance of constant and adequate support to the students should be emphasised again.

11 % of the students at NVNA and 14.3% of the students at UoS FMS think that the biggest challenge of ERT is to stay engaged. According to ASHE (2020), more than half of the students (51 %) at Croatian HEIs considered that the level of motivation for meeting student obligations was much lower during the quarantine than before the quarantine, and 42 % of students considered that there was considerably less interaction between teachers and students during the quarantine than before the quarantine. The lack of interaction could be one of the reasons for the lack of students' motivation. In order to engage the students and retain their attention during the lectures, it is necessary to apply effective teaching methods. The working environment should provide two-way communication between the students and the lecturers, but also between the students, so that the individual student does not feel isolated. Bagarić et al. (2021) investigated the students' satisfaction with DL by anonymous web survey conducted on 249 students at Croatian HEIs during the first month of COVID-19 crises. The results of the survey showed that the students were mostly satisfied with technical support but they were mostly unsatisfied with interaction. However, the students emphasized the irreplaceability of personal contact between students and lecturers.

Approximately, 1/4 of the students at both institutions answered that high quality education navigation courses could not be achieved without traditional classroom lessons. These results are in line with the results of the survey conducted by Katavić et al. (2018) on DL, where students generally considered DL as a supplement to face-to-face learning and not real classes. A slightly higher percentage of the students at UoS FMS (17.3 %) than at NVNA (12.3 %) answered that high quality education in navigation courses could be achieved without traditional classroom. It could be connected with the fact that the students at UoS FMS were more familiar with on-line surroundings than the students at NVNA, due to previous experience in online (DL) or hybrid courses.

However, almost 2/3 of the students at NVNA and more than 1/2 of the students at UoS FMS answered that high quality education in navigation courses could be achieved in hybrid teaching - all practical exercises that require specialized equipment such as simulators, laboratory instruments, navigation charts, and tablets should take place in class. These results are in accordance with the results from different studies. In the study conducted by ASHE (2020), the students emphasized the effectiveness of online teaching in the transferring of theoretical knowledge was good; nevertheless they emphasized the necessity of personal, direct contact between teachers and students. According to Basilaia et al. (2020), blended learning and flipped classrooms could be created by combining traditional face-to-face lectures with technology, and this type of learning environment could increase the learning potential of the students.

The chi-square test ($\chi2$) was performed to test the obtained data comparing two institutions (NVNA and UoS FMS) for six different questions, and there is statistically significant association between the two institutions only for the data on the survey question: Have you ever taken online or hybrid courses before?

5.1. Limitations and Recommendations of the Study

While this study offers useful information regarding undergraduate students' perception on ERT in navigation courses at NVNA and at UoS FMS, it has limited generalizability because of the type of statistical analysis performed. The study builds data analysis on the presentation of percentage shares and Chi-square statistical test ($\chi2$). It would be useful to supplement quantitative data with qualitative data acquired through interviews with students in order to find out why their experience was so different. The main limitation of the research is that it depends on the students' subjective opinions and the new set of more objective, less opinion dependent, and measurable questions should be created. The creation and the implementation of a standardized questionnaire for global use is also recommended.

5.2. Future Research and Application of the Methodology

This pilot study is the first study on ERT conducted at maritime high education institutions in Bulgaria, as well as in Croatia. The results of the questionnaire were sent to the lecturers of the Department of Navigation at NVNA/the Department of Nautical Studies at UoS FMS in order to improve organization of online classes in the academic year 2020/2021. The study revealed that the students were generally satisfied with the quality of three-month ERT in specialized compulsory navigation courses at NVNA and at UoS FMS. The students' positive feedback on ERT can encourage MET institutions and maritime administrations to implement hybrid courses, not only as ERT, but as a standard teaching strategy/practice.

Although this study has limited value, it could be used as a reference point for further studies on students' satisfaction with hybrid courses at NVNA and at UoS FMS. It could become standard methodology in monitoring students' satisfaction with hybrid courses, as well as standard methodology for monitoring improvement of lecturers' skills in practice. The same methodology can also be applied at the other MET institutions.

Besides MET institutions, the study results can also inspire maritime administrations to conduct pilot projects on hybrid courses introduction in MET, in line with global trends in education, stakeholders growing demand for distance learning, without compromising the quality of MET.

6. CONCLUSION

Despite the growing stakeholders' demand (especially part-time students) for the implementation of online/hybrid teaching/learning in MET, MET institutions, as well as maritime administrations, do not encourage the implementation of online/hybrid courses in MET. The scepticism of the academic staff concerning the implementation of online/hybrid teaching/ learning in conservative field of MET was one of the reason for slowing down the process of online/hybrid teaching/learning implementation at MET institutions all over the world. In order to adapt to the complexity of the situation of social isolation during the COVID-19 crisis, MET institutions were forced to implement ERT. Therefore, MET institutions could benefit from lessons learned from the shift to ERT due to the COVID-19 crisis, and they should take proactive steps to implement online/hybrid courses that meet the maritime industry stakeholders' needs.

This pilot study is the first study on ERT conducted at maritime high education institutions in Bulgaria, as well as in Croatia. The results of the survey have shown that more than 3/4 of the students at NVNA and almost 2/3 at UoS FMS graded the overall ERT experience during the summer semester 2019/2020 with a grade higher than 5. The most frequently chosen grade was grade 7 at NVNA and grade 8 at UoS FMS. The students were generally satisfied with the quality of three-month ERT in specialized compulsory navigation courses at NVNA, as well as at UoS FMS. The students' positive feedback can help MET institutions in further implementation of hybrid courses, not only as ERT but as a standard teaching strategy/practice.

However, almost 2/3 of the students at NVNA and more than 1/2 of the students at UoS FMS have answered that high quality education in navigation courses could be achieved in hybrid teaching, but all practical exercises requiring specialized equipment, such as simulators, laboratory instruments, navigation charts, and tablets should take place in class. As almost 1/2 of the students at NVNA and over 1/3 of the students at UoS FMS have answered that the quality of ERT was the biggest challenge, especially the organization of practical training at both institutions, and due attention has to be paid to the organisation of practical trainings. The students' primary concerns regarding ERT (online/hybrid) in navigation courses included the quality of ERT, difficulties with technology, motivation, as well as time management. Both institutions should support the students to build skills and behaviours based on the students' concerns, but also train and support lecturers to develop and deliver high-quality hybrid courses. Additionally, the online/hybrid courses must be designed and carried out in strict accordance with the state requirements for the regulated specialties, as well as the IMO model courses for the training of deck officers and masters 7.03) and 7.01). However, the experience of both lecturers and students should also be taken into account. At both institutions, over 4/5 of the students have answered that time saving and the flexibility were the major benefit of ERT. As one of the major problems is the students' overload at both institutions, the students can benefit from online/hybrid courses introduction.

The study offers useful information both to the lecturers and faculty managements and can help them to adapt their teaching strategies and give an adequate support to the students. The main limitation of the study is that it depends on the students' subjective opinions and creation of standardized questionnaire for global use, with a new set of more objective measurable questions, should be valuable for MET institutions, as well as maritime authorities. Although the study has limited value, it could be used as a reference point for further studies and should encourage MET institutions, as well as maritime administrations, to give strong support to the implementation of hybrid courses in MET. This study could also inspire maritime administrations to conduct pilot projects on hybrid courses introduction in MET, in line with the global trends in education and the stakeholders' growing demand for distance learning, without compromising the quality of MET.

APPENDIX

1. Have you ever taken online (DL) or hybrid courses before?
   - Yes, online courses
   - Yes, hybrid courses
   - Never before

2. Can high quality education in navigation courses be achieved without traditional classroom lessons?
   - Definitely yes. We study everything in practice
   - Partly yes, but some subjects need traditional classrooms and professors
   - Partly yes, all theory can be delivered online and practice in classroom and simulator
   - Definitely no, all subjects in navigation need classroom.

3. Rate your overall DL (online) experience with grades from 1 (extremely bad) to 10 (extremely good) in specialized compulsory subjects in the Department of Navigation during the summer semester 2019/2020.

4. Are you comfortable with the working environment at home?
   - Yes, because I can do all my activities during the class
   - Yes, I generally prefer home environment
   - Yes, but I am not comfortable with video control
   - No, I cannot concentrate at home
   - No, the home environment is meant for rest

5. What do you consider to be the greatest benefit of online courses (DL)?
   - Time saved
   - Flexibility of class time
   - Improved learning
   - More interaction with professors
   - More interactions with classmates

6. What do you consider to be the biggest challenge in online courses (DL)?
   - Quality of learning
   - Time management
   - Missing friends
   - Technology difficulties
   - Family at home
   - Staying engaged

CONFLICT OF INTEREST

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