

# Absenteeism in Maritime Education: Insights, Challenges, and Innovative Solutions

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**Abstract:** Students' attendance at classes is a measure that reflects students' enthusiasm for the course and their status in the university. University-level absenteeism is influenced by various factors, ranging from academic self-perception and attitudes towards lecturers to academic performance. Work-related absenteeism is also linked to stress, group size, commitment, and job satisfaction. It is essential to discern the specific importance of these factors.

The STCW-IMO convention provides the international minimum standards for maritime education and training and the minimum requirements for the competences of seafarers and also adapted standard models of competence-based training to this convention. Even though all this knowledge and skills are well specified, attendance is only required for some specific maritime courses. Due to the importance of classroom attendance, this paper presents the results of the teaching innovation project titled "Active methodologies for face-to-face and participatory learning (ASAP-UPC)" and seeks to quantify current levels of absenteeism, identify its main causes and propose initiatives to improve classroom attendance at the Barcelona School of Nautical Studies (FNB-UPC). These findings hold significance for FNB-UPC lecturers and decision-making bodies, as they highlight areas that can be improved to offer a more useful experience to our students. Moreover, the outcomes of this research can potentially be applied to other Maritime Education and Training Institutions (METIs).

*Keywords:* Absenteeism; Maritime Education and Training; polytechnic studies; teaching innovation

## 1. Introduction

Students' attendance at classes is a measure that reflects students' enthusiasm for the course and their status in the university (Westerman, Perez-Batres, Coffey and Pouder, 2011). A multitude of studies have explored the reasons of absenteeism at higher education institutions and have investigated the correlation between class attendance and academic achievement at the university level (Pappu, Vandurangi and VizayaKumar, 2006; Rendleman, 2017; Moores, Birdi and Higson, 2019; Keyser, 2019; Nja, Cornelius-Ukpepi and Chinyere Ihejiamaizu, 2019; Shaaban and Reda, 2021; Summers, Higson and Moores, 2021; Deng, Jianjun, Jing and Zitong, 2021). University-level absenteeism is influenced by various factors, ranging from academic self-perception and attitudes towards lecturers to academic performance. Work-related absenteeism is also linked to stress, group size, commitment, and job satisfaction. It is essential to discern the specific importance of these factors. A comprehensive global analysis of absenteeism worldwide is lacking, with only specific study-based absenteeism percentages currently available. According to results in López-Bonilla & López-Bonilla (2015), students regard the lecturer's teaching method and competence as the most influential factor of their absenteeism. Nevertheless, while low-quality lectures may foster absenteeism, higher-quality lectures do not necessarily guarantee increased attendance.

In the context of Maritime Education and Training (MET), higher education institutions have specific requirements whereby students must adhere to the particular characteristics of internationalization and

specialization as outlined by the International Maritime Organization (IMO). The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW code) provides the international minimum standards for maritime education and training and the minimum requirements for the competences of seafarers (IMO, 2010) and adapted standard models of competence-based training to this convention. By requiring these courses in Maritime Education and Training Institutions (METIs), aspiring seafarers can acquire the necessary qualifications to pursue career opportunities in the maritime industry. Additionally, ongoing training and certification help experienced seafarers stay updated on new regulations, technologies, and best practices, enhancing their employability and career prospects. The international nature of these standards ensures universal acknowledgment of minimum requirements, maintaining a consistent level of competency among seafarers regardless of their nationality or the vessel's flag they serve on. The requirement for STCW courses in METIs aids countries in adhering to these global standards. Despite the detailed specifications of knowledge and skills, attendance is mandatory only for certain maritime courses.

Due to the importance of classroom attendance, this paper presents the results of the teaching innovation project titled “Active methodologies for face-to-face and participatory learning (ASAP-UPC)” and seeks to quantify current levels of absenteeism, identify its main causes and propose initiatives to improve classroom attendance at the Barcelona School of Nautical Studies of Universitat Politècnica de Catalunya (UPC). UPC is a Spanish public institution of research and higher education specializing in engineering, architecture, sciences and technology. UPC encompasses nine campuses and 17 schools. In particular, Barcelona School of Nautical Studies (FNB) accommodates 697 bachelor students and 117 master students (academic year 2023-24). The school offers three bachelor's degree programs: Bachelor's degree in marine technologies (GTM), Bachelor's degree in nautical science and maritime transport (GNTM) and Bachelor's degree in naval systems and technology engineering (GESTN). Additionally, the FNB offers three master's degree programs: Master's degree nautical science and maritime transport management (MUNGTM), Master's degree in the management and operation of the marine energy facilities (MUGOIEM) and Master's degree in naval architecture and ocean engineering (MUENO). The GTM, GNTM, MUNGTM and MUGOIEM degrees are designed to prepare seafarers to obtain the required competences and obtain STCW certificates. All bachelor's degree programs are on-site offering mass enrollment, and master's degree programs, which offer fewer submissions, can be categorized into on-site (MUENO) or blended degrees (MUNGTM and MUGOIEM). In spite of the nature of STCW courses in METIs to promote safety, professionalism, and competence among seafarers, the general academic regulations of the UPC do not consider attendance and therefore do not establish rules in this regard (Vicerectorat de Política Acadèmica UPC, 2023). Additionally, according to the STCW Convention, maritime cadets must fulfill a 12-month onboard training to be eligible for a Certificate of Competency (CoC). This situation also does not contribute to an increase in-person attendance in class, especially in the STCW master's degree programs (MUNGTM and MUGOIEM). This is the main reason why these master's degree programs are blended.

Absenteeism rate at FNB have been steadily increasing, causing concern among lecturers. The first attempt to understand the current situation and take action to implement measures occurred in 2020-2021 through a general absenteeism survey distributed to all UPC students. In all surveyed centers, absenteeism was observed, as the average was 39.76% (Vicerectorat Política Universitària, Gabinet de Planificació, Avaluació i Qualitat UPC, 2022). The underlying reasons for the high absenteeism rate indicated the need for further investigation.

This study aims to assess current absenteeism situation and propose mitigation strategies by addressing the following research questions (RQ):

- RQ1. What is the extent of absenteeism at FNB, and which degree programs are the most affected?
- RQ2. What are the underlying causes of absenteeism at FNB?
- RQ3. Is there a correlation between attendance and attainment at FNB?
- RQ4. Which teaching strategies do FNB lecturers deem most effective in improving attendance?

## 2. Methodology

The methodology applied not only analyzes and quantifies the current level of absenteeism but also identifies its main causes within the nautical field, aiming to determine its impact on both students and lecturers. The methodology consisted of two stages: gathering and analyzing students and lecturers data and redesigning teaching methodologies to mitigate absenteeism (see Figure 1).

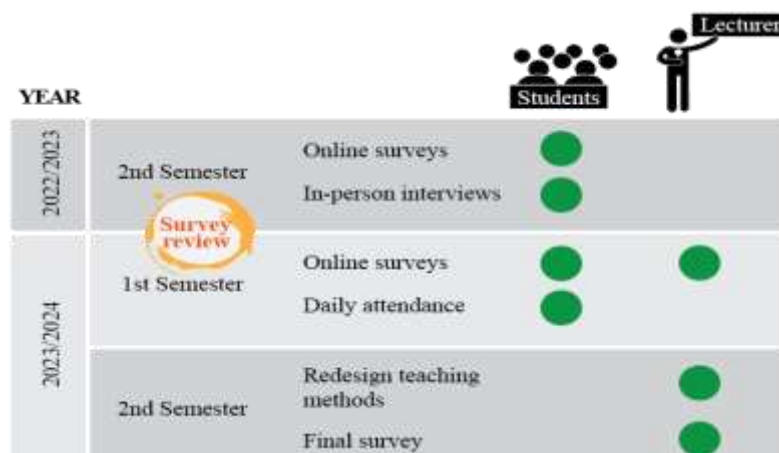


Figure 1. Research methodology

Initially, to picture the absenteeism within the area of MET, the methodology employed involved conducting surveys and interviews. These methods were utilized to gather insights concerning lecturers’ and students’ perceptions. Secondly, daily attendance records were tracked and analyzed alongside students’ grades. Finally, after analyzing student and lecturers’ data and daily attendance records, redesigned teaching methodologies were proposed to mitigate absenteeism through a final survey.

2.1. Surveys & Interviews

A survey, which targeted students enrolled in the second semester of the 2022-23 academic year in Bachelor’s degree programs (BSc), was created to identify the factors behind students' absenteeism, to explore strategies that could improve attendance, and to determine the skills they consider most crucial for their profession. During the same semester, some in-person interviews were conducted with students who attended less than 25% of the classes, inquiring about the specific reasons for their non-attendance. Based on the results, in the first semester of the 2023-24 academic year, an improved iteration of the survey was administered to students of Bachelor's and Master's degree programs offered at FNB, following a comprehensive analysis of the initial findings. Table 1 shows the number of targeted students involved throughout this entire period. The rate of response was 30.3% for the first survey and 47.8% for the second one.

Table 1. Online surveys and in-person interviews targeting MET students, disaggregated by sex

Academic Year	Bachelor (BSc)/Master’s Degree (MSc)	Enrolled students	Woman	Man
2 <sup>nd</sup> semester 2022-23	Online Surveys. BSc	151	22%	78%
	In-person interviews. BSc	14	15%	85%
1 <sup>st</sup> semester 2023-24	Online Surveys. BSc	127	18%	82%
	Online Surveys. Blended MSc	34	7.5%	92.5%
	Online Surveys. On-site MSc	21	29%	71%

On the other hand, an online survey to FNB lecturers was also conducted during the first semester of the academic year 2023-24 to collect their perceptions. This survey included basic questions regarding subject type, whether attendance was compulsory and on the evolution of absenteeism over the years, including more specific questions concerning potential actions to improve attendance. The participation rate was 31.4%.

2.2. Daily Attendance record

Daily attendance was tracked for subjects taught by ASAP-UPC lecturers and analyzed alongside students' grades at the end of the first semester of academic year 2023-24. Tracking class attendance is necessary to evaluate absenteeism for several reasons. Firstly, it allows lecturers to identify trends and patterns in student attendance, which can reveal potential issues such as disengagement, disinterest, or personal challenges that may be hindering students from attending class regularly. By understanding these patterns, lecturers can intervene early and provide necessary support to help students to stay on track academically. It can also be discerned that interest and attendance in the classroom contribute to achieving higher scores.

3.3. Redesign teaching methods

Finally, based on the results obtained in the previous sections, a second survey was conducted to collect information regarding ongoing modifications of their subjects aimed at boosting attendance. A list of potential actions to implement were presented, including new methodologies and assessment methods, which were selected based on team debates held during the whole project.

### 3. Results

#### 3.1. Surveys & Interviews

The main objective of these surveys and interviews is to conduct a causal analysis of absenteeism to propose possible practical solutions to address it. In the first online survey addressed to bachelor’s students, they were asked about the reasons for not attending class. A high percentage (41.7%) responded with "others," without specifying what these other reasons were in the open-ended question that followed. Consequently, it was decided to conduct personal interviews with students who had attended less than 25% of the classes, aiming to gain deeper insights into the cause for their lack of attendance. According to the responses, the primary reason for not attending classes was work obligations (43%), despite acknowledging the importance of attending class. Students stated that the problem does not stem from the quality of teaching, but rather from other factors. To get more insight in this “other” response, in the 1st semester of the academic year 2023-24, the student survey was redesigned, providing more mandatory closed-ended responses to this question in order to analyze it more effectively. Thirty-five percent of students cannot attend classes due to the time scheduling (they are retaking the subject and have another class scheduled at the same time) and twenty-one percent of students miss lessons due to medical reasons. It was observed that the percentage of "other" responses had decreased to 6%. In Figure 2, it is shown that although the main causes of absenteeism are the same in bachelor's (Bs) and master's (MSc) degrees, in the case of bachelor's degrees, there are more reasons for non-attendance, while in master's degrees, it is concentrated in less responses, the main one being that the schedule doesn't fit (probably because they are on-board).

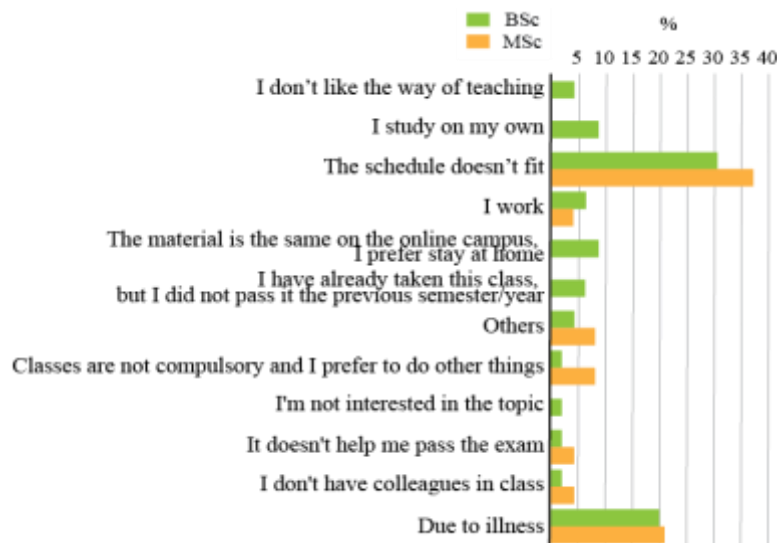


Figure 2. Participants' main reasons for not attending classes

Over half of the surveyed students indicated that they would be more interested in attending class if they perceived that the classes held greater value for their learning and were useful in passing their subjects. In the last question, students were asked about the skills that they considered most relevant to their professional life, with the answers being “gaining knowledge” (35.2%) followed by “resolution capacity” (30%). These results aligned with the responses that students had provided regarding the actions necessary to increase class attendance.

Finally, the lecturer’s survey examined the lecturer's involvement in implementing new methodologies to improve their teaching practices and thus increase classroom attendance. Fifty-seven percent of lecturers have taken action to improve their teaching based on the feedback and comments of the general UPC student satisfaction survey conducted at the end of each semester. However, among those who had taken any action, 66.7% report that they had not noticed any improvement in class attendance after implementing them.

### 3.2. Daily Attendance record

Results for attendance rate for each degree are presented in Figure 3 (left). In general terms, absenteeism tend to be higher in the case of bachelor's degree programs (the final increase in the GNTM is due to mandatory simulator practices), while in master's programs, attendance increases over time, and they exhibit high levels of attendance, attributed to their status as specialized master's programs, fostering high student motivation.

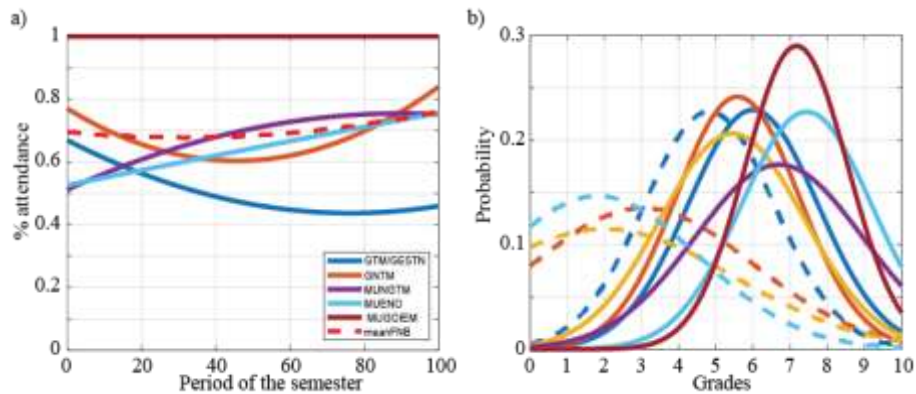


Figure 3. (left) Attendance rate evolution during first semester of 2023-24 academic year; (right) Gaussian curves of the students grades base on their attendance (continuous line attendance higher 50%; dashed line attendance less than 50%; orange: GNTM, dark blue: GNTM/GESTN, purple: MUNGTM, light blue: MUENO and dark red MUGOIEM)

On the other hand, Figure 3 (right) shows Gaussian curves representing the probability of achieving a particular grade based on attendance. A typical Gaussian shape is obtained of those students attending at least 50% of the classes (continuous line) indicating that most regularly attending students achieve grades in the range of 5.5 and 6.5 in the bachelor's degree programs and higher grades in the master's degree programs. However, students attending less than 50% of the lessons (dashed line), the mean grade is lower than 5. This illustrates how class attendance may correlate with attainment, showing that students with higher attendance tend to achieve higher grades compared to those with lower attendance.

### 3.3. Redesign teaching methods

Based on the students' and lecturers' responses, a new survey was conducted among members of the ASAP-UPC project. Specific methodologies for teaching improvements were discussed. Each coordinating lecturer, with the collaboration of the teaching team, designed an improvement action based on identified best practices. Best practices to improve classroom attendance were categorized into three groups: (1) Specific follow-up activities, which include tasks such as quizzes, exercises, tutorials, group assignments and follow-up questionnaires; (2) Teaching innovation activities, which involve incorporating innovative teaching methods such as collaborative activities, the flipped classroom approach, and an increase in laboratory or simulation practices to offer a more active learning framework and (3) Modification of the syllabus, a proposal for reducing some theoretical contents and introducing more hands-on activities. The most common improvement measure implemented was the introduction of additional exercises during lessons. Specifically, 71% of the ASAP-UPC members now integrate student-solved exercises into their classes. Moreover, exercise resolution is included in the assessment system of 91% of subjects, and many lecturers intend to strengthen this aspect. Active learning laboratory and simulator practices are incorporated into 65% of subjects, and 77% of lecturers plan to increase their frequency. Another finding is that 35% of subjects are adjusting exam format to avoid standardized exams that can be answered without a deep understanding of the topic.

## 4. Conclusions

The main goal of this study is to provide a more comprehensive understanding of the causes of absenteeism in maritime studies. To achieve this goal, different surveys and interviews were conducted to explore the insights of lecturers and students on absenteeism in a higher MET education. The findings indicate that the extension of absenteeism at FNB varies significantly across the programs, with heightened absenteeism in large groups of students at the Bachelor's degree level. Many students express dissatisfaction with face-to-face classes, citing a perceived lack of balance between theory, experimental practice, and problem-solving

components. Additionally, they perceive that attendance is unhelpful to pass exams. However, research has shown that there is a correlation between attendance and attainment, suggesting that increased attendance enhances the probability of obtaining higher grades in the FNB context. The literature indicates that aligning teaching and assessment methodologies may increase the perceived value of classes. Hence, adopting a more contextualized teaching approach, emphasizing problem-solving activities, and adapting exams to a non-standardized format seem to be feasible teaching solutions. On the other hand, all master's programs have higher attendance, and therefore higher grades, even as the semester progresses. This could be due to courses having fewer students, as well as that two master's programs are blended and the in-person classes are particularly important (for practices, simulations, exams, and visits).

Building on these findings, guided by group reflections, the next phase involves formulating and integrating identified good practices into a database. The proposed good practices are expected to be a turning point, not only in student motivation, but to foster in cultivating more significant learning experiences that can be shared among Maritime Education and Training Institutions (METIs). However, a period of implementation is needed to find out if these measures are effective.

The ASAP-UPC initiative is a one-year project focused on the academic programs at UPC. Nevertheless, extending the project's duration and conducting a more comprehensive analysis would enhance its generalizability. By breaking down the key factors for a more detailed study of their effects on absenteeism and comparing these findings with absenteeism data from other METIs, the study's applicability and relevance could be significantly improved.

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