

THE CONSOLIDATION OF MILITARY POLYTECHNIC HIGHER EDUCATION IN PORTUGAL¹

A CONSOLIDAÇÃO DO ENSINO SUPERIOR POLITÉCNICO MILITAR EM PORTUGAL

Rui Manuel de Jesus Romão

Brigadier General, Pilot in the Portuguese Air Force
Master's degree in Military Operational Arts and Science from the U.S. Air Force University, Alabama
Director of the General Officer Course
Military University Institute
1449-027 Lisbon
rmjromao@gmail.com

Paulo Jorge Lopes da Silva

Cavalry Colonel in the Portuguese Army
Master's degree in Military History from the University of the Azores
2nd Commander of the Pandur Mechanized Brigade.
Santana Headquarters, Rua de Infantaria 23,
3000-219 Coimbra
pj.lopesdasilva@gmail.com

Nuno Alberto Rodrigues Santos Loureiro

Lieutenant-colonel, Air Material Maintenance Technician in the Portuguese Air Force
Degree in Business Management from Instituto Superior de Línguas e Administração de Lisboa
Lecturer at the Postgraduate Studies Department of the Military University Institute
Researcher at the Research and Development Centre of the Military University Institute
1449-027 Lisboa
Researcher at the Interdisciplinary Social Sciences Centre of the NOVA University of Lisbon
1070-312 Lisbon
nuno.a.loureiro@gmail.com

Abstract

The new legal requirement for Non-Commissioned Officers (NCOs) to have a level 5 qualification, as defined in the national qualifications framework, is a fundamental shift. The Military Polytechnic Unit (MPU), which is in the installation process until 2023, is now responsible for the NCOs education, within the scope of the military polytechnic higher

How to cite this article: Romão, R. M. J., Silva, P. J. L., & Loureiro, N. A. R. S., (2022). The Consolidation of Military Polytechnic Higher Education in Portugal, *Revista de Ciências Militares*, November, X(2), 45-73. Retrieved from <https://www.ium.pt/s/wp-content/uploads/CIDIUM/Lista%20Pt/Lista%20de%20publica%C3%A7%C3%B5es%20Revista%20De%20Ci%C3%A7ncias%20Militares.pdf>

¹ Article adapted from the individual research work conducted in the 2021 / 2022 General Officer Course. The defence took place on 7 June 2022 at the Military University Institute.

education. This study aims to propose guidelines to consolidate military polytechnic higher education, a component of the military higher education system, and analyse the legislation applicable to it. The methodology chosen for the study was a hypothetico-deductive approach based on a mixed strategy and a case study research design. The data were collected through semi-structured interviews with experts and a literature review. The study revealed that the MPU Faculty is adequate but not stable; that its research process is still being developed and that opinions are divided regarding the need for and purpose of creating a first cycle degree programme at the MPU, even if the law requires it. Furthermore, to be accredited, the MPU must have a stable Faculty, in addition to conducting guided research and offer first cycle degrees. However, it may choose the timing and legal framework that best suit the reality of the Portuguese Armed Forces and the Republican National Guard [*Guarda Nacional Republicana*], and the growing complexity of the operational environment.

Keywords: Military Higher Education; Military Polytechnic Higher Education; NCO Training.

Resumo

A exigência estatutária para os Sargentos terem o nível 5 de qualificação, segundo as regras do ensino superior, corresponde a uma mudança significativa de paradigma. Tendo sido atribuída à Unidade Politécnica Militar (UPM), em instalação até 2023, a missão de formar os Sargentos no âmbito do Ensino Superior Politécnico Militar, é objetivo deste estudo propor linhas de orientação para a sua consolidação, no contexto da especificidade do Ensino Superior Militar e da legislação que lhe é aplicável. Como metodologia adotou-se um raciocínio hipotético-dedutivo, segundo uma estratégia mista e o estudo de caso como desenho de pesquisa. Os dados recolhidos em entrevistas semiestruturadas e revisão documental, evidenciam que o corpo docente da UPM, sendo adequado, não é estável, que a investigação não sendo nula, é incipiente, e que não há consenso quanto à necessidade ou propósito de a UPM ministrar licenciaturas, mesmo que a lei assim o exija. Concluiu-se ainda que para a UPM ser acreditada deverá estabilizar o seu corpo docente, fazer investigação orientada e ter licenciaturas na sua oferta educativa. Contudo, poderá escolher o prazo e o enquadramento legislativo que melhor se adequam à realidade das Forças Armadas e da Guarda Nacional Republicana e à crescente complexidade operacional.

Palavras-chave: *Ensino Superior Militar; Ensino Superior Politécnico Militar; Formação dos Sargentos.*

1. Introduction

*“Education is the most powerful weapon you can use to change the world”
Nelson Mandela (1990)*

The Military Polytechnic Unit (MPU) was established in Portugal in December 2019. The first cycle in this new model of Military Polytechnic Higher Education (MPHE) started

in September 2020 and is set to end in July 2022. The MPU is integrated in the Portuguese Military Higher Education System (MHES) and is one of the main education establishments of the Portuguese Armed Forces (AAFF) and the National Republican Guard (NGR). It was established during a period of financial constraints imposed by the laws on higher education, in an increasingly complex operational environment. The ability of the non-commissioned officers of the AAFF and NRG to operate in this environment depends, in part, on the success of the installation of the MPU. The aim of this first study on the MPU is to propose measures to consolidate MPHE.

Therefore, the study will begin with a brief analysis on the evolution of the MHES from 1999 until the present. Despite the fact that the legal framework that regulates the institutional relations between military higher education establishments and university establishments in Portugal was defined in 1986 (Decree-Law No. 48/86 of 13 March), and that, in the last forty years, the MHES has undergone significant changes (Borges, 2021, p. 32), this study will only address the period after the Bologna declaration was adopted. The joint declaration by the European Ministers of Education in Bologna, in 1999, was the cornerstone of the reform of the European higher education system (Direção-Geral do Ensino Superior - DGES, 2019) and of the Portuguese higher education system (PHES). For several reasons, but especially due to the need to ensure the quality of the MHES, whose Faculty must have suitable qualifications, and because they must operate in an increasingly demanding strategic environment for security and defence, the AAFF have accompanied the reforms to the PHES².

The Bologna process resulted in several legislative initiatives, three of which are especially relevant for the current process of assessment, accreditation and consolidation of the MHES – the regulatory framework for higher education degrees and diplomas (Decree-Law No. 74/2006 of 24 of March); the regulatory framework for higher education institutions (Law No. 62/2007 of 10 of September) and the regulatory framework for the assessment of higher education (Law No. 38/2007 of 16 of August).

Concurrently, the economic and financial context in 2011 led Portugal to implement the “Defence 2020” reform, which implied the adoption of criteria to ensure sustainability, optimization, rationalization, and profitability in the use of resources (Ministry of National Defence MDN, 2015). For the MHES, this reform implied the creation of a new common governance model and the establishment of the IUM, “which will reduce costs and rationalise resources, including the cost of hiring teachers” (MDN, 2015). In 2015, after negotiations between the MDN and the AAFF, the status of the IUM and the new organic structure of the MHES were approved, and their specific features were enshrined in the legislation that governs higher education (Decree-Law No. 249/2015 of 28 October). This new legislation is an adaptation to the Bologna process, but it is also the result of the evolving economic and financial context.

² Analysing the evolution of the Portuguese MHES falls outside the scope of this study. Readers who wish to learn further about this topic, see Borges (2014) and Borges et al. (2014).

In addition to establishing the new organizational structure of the MHES, Decree-Law No. 249/2015 integrates the MPU in the IUM and enables it to comply with the requirements for the admission of NCOs to the career staff (CS) of the AAFF and to the NRG's NCO category. For the first time, NCOs will be eligible for admission to the CS after completing, "a level 5 cycle of studies, as defined by the Portuguese Qualifications Framework (QNF), in a polytechnic higher education institution" (Order No. 288/2019 of 3 September).

The new model of MPHE is regulated by Decree-Law No. 17/2019 of 22 January – which establishes the structure of the MPU and the specificities of the polytechnic component of the MHES, which is integrated in the PES – and Order No. 288/2019, which regulates the system to award a level 5 diploma through the NCO Training Course (NTC). The MPU was activated by Decision No. 167/CEMGFA/2019 of 03 December, and its installation process is set to end after the 2022-2023 school year, as set out in the regulating diploma.

As two years have passed since the MPU was activated, the implementation of this new model of MPHE should be analysed. This is the focus of the present study. Understanding how to consolidate a model that represents a fundamental shift in the training of NCOs which is relevant to the AAFF and the NRG – as the quality of military education and training is a strategic asset –, but also for the process of assessment and accreditation of the MPU and the IUM.

As set out in Art. 3 of Decree-Law No. 249/2015, the MHES is organized in a binary system, which includes a university component and polytechnic component. This study will focus on the latter. Having made this delimitation, it was necessary to define the study in terms of content, time, and space (Santos & Lima, 2019, p. 42). After a preliminary analysis, the research content was delimited to three key concepts for the study of higher education: Faculty; Research and Study Cycles. Temporally, the study addresses the period after Decree-Law No. 249/2015 was issued, which corresponds to the MPU's installation period. Geographically, the study analyses Portuguese MPHE, and, when needed, it considers data from other national and European contexts. As the study will analyse a new model of MPHE at a specific moment in time – the present – to ascertain how it can be consolidated, a cross-sectional time horizon was used.

The general objective of the study is to propose guidelines to consolidate the Portuguese MPHE model, bearing in mind the specificity of the MHES and the legislation applicable to it. The following specific objectives were deduced from the general objective:

- i. To analyse the MPU Faculty from the perspective of the Branches' human resources and the legislation in force.
- ii. To analyse the level of the Research conducted at the MPU.
- iii. To analyse the need for and the purpose of creating first-degree Study Cycles at the MPU.

The research question, that is, the problem that this study will attempt to solve, or, as Creswell put it (2007, cited in Santos & Lima, p. 49), "the need for the study", is how to consolidate the current model of MPHE, bearing in mind the specificity of the MHES and the applicable legislation.

2. Theoretical and conceptual framework

This chapter contains the literature review and the key concepts addressed in the study.

2.1. Literature review and key concepts

As the current MPHE model is still new, the literature review focused on the documentation and legislation on the decrees and diplomas awarded by higher education establishments and on their assessment, especially those that concern the MPU. The literature review also served to identify the most relevant concepts for the study.

Art. 44 of Law 62/2007 sets out a list of minimum requirements for the creation and operation of a polytechnic education establishment, such as having a Faculty that complies with the provisions of Art. 49, conducting research activities and offering first-degree Study Cycles. According to the MPU activity report for 2020, the main challenges for the development of MPHE are the stability of the Faculty, the availability of recognised experts, the creation of a first-degree programme in the MPU, and conducting Research and Innovation activities (IUM, 2020). Faculty and Research were also identified as weaknesses in the final assessment / accreditation report of the External Evaluation Committee (EEC) of the Agency for Assessment and Accreditation of Higher Education (A3ES), in 2019, as part of its institutional review of the IUM (2020).

The minimum requirements set in Art. 44 of Law 62/2007 for polytechnic institutes were compared with the results of the assessment of the IUM by the A3ES, and with the data from the MPU activity report for 2020. This made it possible to identify minimum requirements common to the three sources of information, all of which are considered essential for the functioning of the MPU. These requirements are also included in the list of “quality criteria to assess the performance higher education institutions” (Art. 4 of Law No. 38/2007) used by the A3ES.

2.1.1. Military Polytechnic Higher Education

MPHE is both the topic of this study and a key concept. Therefore, this section will address its specificities and features.

2.1.1.1. Specific features of Military Polytechnic Higher Education

The MHES has specificities recognised by law, such as “[the focus on] the military sciences, [the fact that the] administrative and advisory bodies obey ... the military chain of command, the polytechnic component, and the autonomy of the educational units” (Decree-Law No. 249/2015). The provisions of Art. 275(1) of the Constitution of the Portuguese Republic and the requirements of the military profession also contribute to the specificity of the MHES: fighting for one’s country, if necessary, at the cost of one’s own life; being permanent available for duty; submitting to the military hierarchy; or the restrictions on some rights and freedoms (Law no. 11/89 of 01 June)³. Therefore, the main purpose of the MHES is to prepare service

³ The authors will not list all, but only some specificities of the MHES, such as those mentioned in the preamble to Decree-Law No. 249/2015, as an example of the specificities that distinguish the MHES it from PHE.

members to perform their duties in the military defence of the Republic – “the Armed Forces are responsible for the military defence of the Republic” (Constitutional Law no. 5/2005 of 12 August).

In addition to the requirements mentioned above, the specificities of the MHES include the ethical values, the admission requirements, the existence of a “pre-defined employer,” the balance between basic and advanced training or the small number of students in the various Study Cycles (Borges, 2021).

On the other hand, MPHE is part of the MHES. As such, it has the same specificities, in addition to providing basic scientific training (technical and technological), behavioural training (solid military, moral and civic education) and military and physical training. The specific features of MPHE aim to provide NCOs with specific skills inherent to military duties: command, leadership and technical leadership, executive, technical-administrative, logistical, and training (Decree-Law No. 17/2019).

Naturally, these specificities pose challenges to the adaptation to the Bologna process. Therefore, when the Faculty, Research and Study Cycles are reviewed in the light of the legislation that governs MPHE, specificities must be taken into consideration. So far, this has been the case. The A3ES recognises the specificities of the MHES provided for in Art. 179 of Law No. 62/2007 and made allowances for them in its institutional assessment of the IUM (A3ES, 2020, p. 1).

2.1.1.2. The Main Features of the Military Polytechnic Unit

The MPU is a MPHE establishment that operates as an autonomous unit of the IUM and answers to the IUM Commander. It is evaluated under the higher education general assessment and accreditation system (Ferreira, 2021) and its mission is to provide training and practice based research to the NCOs of the career staff of the AAF and the NRG, so they can “perform the duties assigned to them by law” (Decree-Law No. 17/2019).

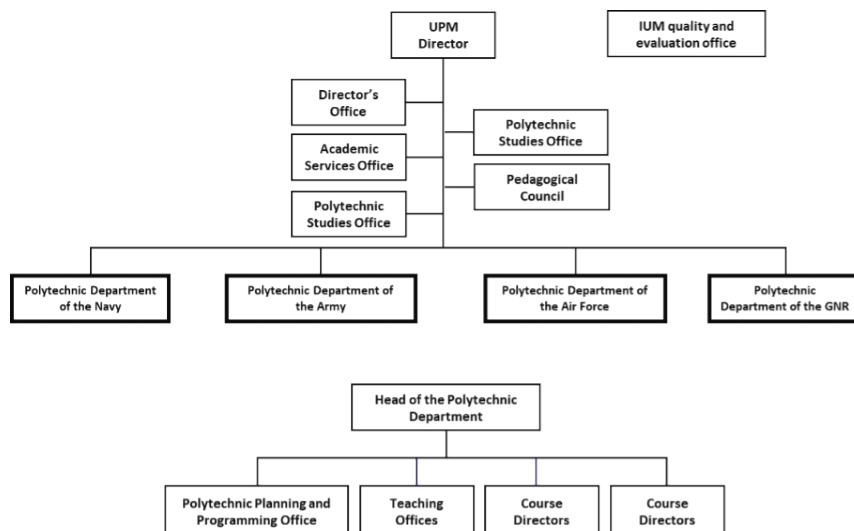


Figure 1 – MPU structure

Source: Costa (2021).

Figure 1 shows the structure of the MPHE model, which completes the transition from professional training to higher education and represents a new paradigm in the training of NCOs (Costa, 2021).

According to Ferreira (2021), MPHE has a centralised direction and decentralised executive bodies, and a small planning and coordination staff at the IUM; it has scientific, cultural, pedagogical and disciplinary autonomy, but not administrative; the model is differentiated by Branch and NRG; the staff of the schools / training centres of the Branches and the NRG (who had been assigned to the former NTC) are now also assigned to the MPU, while the courses, which are now managed by the polytechnic departments, are taught in the Units, Establishments and Services (UES) of the Branches and the NRG. Under Art. 10(3) of the MPU's Internal Regulations (IR), "polytechnic departments coordinate their activities with the respective Branch of the Armed Forces and the NRG, specifically, with the UES defined through a decision of the Chief of Staff of the Branch and the General Commander of the NRG" (Decision No. 2084/2020, 13 February). Therefore, MPHE depends on the Branches and the NRG for coordination and support.

2.1.2. Faculty

Art. 29(1) of Decree-Law No. 17/2019 states that the Faculty of the MPU's polytechnic departments consists of the teachers and researchers, both military and civilian, who teach courses and conduct scientific research in those departments, namely through arrangements, protocols, and agreements with universities, polytechnic institutes, and other institutions.

Given the specific requirements of MPHE, the academic qualifications of the MPU Faculty range from secondary education to PhDs. Furthermore, the Faculty includes experts with experience and expertise in the areas in which the MPU offers degrees and diplomas. The

amendment to Decree-Law No. 249/2015 (through Decree-Law No. 29/2021 of 28 April) made it possible for these experts to be recognised, which improved the quality of the MPU Faculty. The MPU's Scientific and Technical Council (STC) recognises as experts military personnel: who hold a higher education degree and have at least ten years of professional experience; who were on active duty for at least five years out of the previous ten, in the area in which they are recognised as experts; who have relevant work experience and an outstanding CV, duly confirmed and approved by the MPU's STC (Regulatory Decision No. 18/2021 of 07 July).

2.1.3. Research

Conducting guided research activities is one of the assessment criteria for polytechnic institutes. Art. 3 of Decision No. 2084/2020 states that conducting research is part of the MPU's mission. Art. 29 of the MPU's IR includes practice based research activities that award qualifications in relevant areas covered in the course plans, namely areas 861 (protection of people and property) and 863 (military security) of the National Classification of Education and Training Areas (CNAEF). The IR also states that research activities must be coordinated with the IUM's Research and Development Centre (CIDIUM) and, when appropriate, with the Naval Research Centre of the Naval School, with the Centre for Research, Development, and Innovation of the Military Academy and with the Research Centre of the Air Force Academy (Decision No. 2084/2020).

2.1.4. Study Cycles

The A3ES defines a study cycle as the training "provided by a higher education establishment, which awards an academic degree (first-degree, master's or PhD)" (n.d.), whereas Decree-Law No. 74/2006 also mentions study cycles that award academic degrees or diplomas. Art. 77 of the Status of Armed Forces Personnel (EMFAR) states that the MHES includes study cycles "that award academic degrees and those that do not" (Decree Law No. 90/2015 of 29 May). In the future, the MPU will offer first-degrees, but currently it only offers study cycles that award the Higher Professional Technician Diploma (HPTD) through the IUM (Decree-Law No. 17/2019). The A3ES' definition of study cycle will be used in this study, as one of the focuses of the research is to analyse the need for and purpose of creating a first-degree programme at the MPU.

3. Methodology and Method

3.1. Methodology

The study uses hypothetic-deductive reasoning, as proposed by Karl Popper. This research methodology was chosen (Santos & Lima, 2019, p. 20) because it best fit the study topic and the problem to be solved, and because it allows for the formulation of hypotheses to guide the research. Formulating hypotheses that "guide the data collection process and the choice of the research design to evaluate" and ascertain their validity is considered a quantitative research strategy (Santos & Lima, 2019, p. 25). On the other hand, the data collection

method, which consists of a literature review and semi-structured interviews, is considered a qualitative strategy. Therefore, a mixed research strategy was chosen, as it would best fit the characteristics of the study. Bryman (2012, cited in Santos & Lima, 2019, p. 31) argued that it is necessary to “fully understand the topic of a study” to analyse it thoroughly. This is in line with the qualitative-quantitative research continuum proposed by Newman and Benz (1998, cited in Santos & Lima, 2019, p. 30). The combination of qualitative and quantitative data in the same study aims to use both methodologies in a complementary way, rather than as opposites or rivals (Meirinho & Osório, 2010).

A case study research design was chosen because it allows for a thorough analysis of the study topic (Yin, 2005, cited in Santos & Lima, 2019, p. 36). According to Meirinho and Osório” (2010, p. 64), a case study design is used when one wishes to “study the topic (the case) in its real life setting, using multiple sources of evidence (both qualitative and quantitative)”. Furthermore, “it is based on a knowledge building rationale that accounts for the researcher’s subjectivity.”

3.2. Method

3.2.1. Participants

The study identified eighteen interviewees who hold positions with direct or indirect responsibilities in the implementation of the MPHE model in Portugal. Most interviewees perform duties related to the three research topics (Faculty, Research and Study Cycles) and hold Command and Direction positions in the MHES and MPHE, have responsibilities related to human resources management in the Branches / NRG, or oversee the direction of research at the IUM. Therefore, according to Rego, Cunha and Meyer Jr. (2018, pp. 47-48), they form a homogeneous group of experts with relevant expertise on the topic under analysis.

3.2.2. Data collection instruments

The script was prepared for the semi-structured interviews, which contained a set of questions (Santos & Lima, 2019, p. 85) organized in blocks that corresponded to the research topics, which provided interviewees a general ideal about the study. The script was organized according to topics, and each interviewee was able to choose the questions they wished to answer, according to role, type of response (written or oral) and interview type (face-to-face or videoconference).

In addition to the interviews, as advised by Almeida et al. (1994, cited in Santos & Lima, 2019, p. 92), data were also collected through a traditional literature review, which was used to analyse the study topic in the light of the legislation that governs it and the documentation issued during the two years of activity of the MPU.

3.2.3. Data processing techniques

The study used qualitative content analysis to process the data, which were reduced according to the first three steps proposed by Guerra (2006): transcription, when applicable; reading and summarising the interviews to perform a longitudinal comparison and assess the

saturation of the data (2006, cited in Santos & Lima, 2019, p. 123). In the fourth stage, the data were organized according to the key concepts.

In the last phase of the qualitative content analysis, the data were divided according to their positive or negative impact on the consolidation of MPHE. This was done using a SWOT matrix ⁴adapted from the model used by the A3ES (2017) for its institutional accreditation processes.

4. The impact of Somali piracy on the (in) security of seafarers and citizens

This chapter presents the data, discusses the findings, assesses the hypotheses and answers the subsidiary questions and the research question.

4.1. Faculty suitability and stability

The first specific objective of the study is to analyse the MPU Faculty from the perspective of the Branches' human resources and of the legislation that governs higher education.

4.1.1. Human Resources of the Branches

For the purposes of this study, the human resources available to the AAFP are the total number of active-duty personnel on 31 December 2021.

Since 2013, the AAFP staff numbers have been set at between 30,000 and 32,000, "including those in the active-duty reserves" (Decree-Law No. 31/2015 of 4 March) and excluding "personnel in training" (Decree-Law No. 6/2022 of 7 January).

After the "Defence 2020" reform, the Council of Chiefs of Staff (CCEM) decided that the "minimum staff numbers in the organic structure of the Armed Forces required to ensure its proper functioning" would be set at 32,000 service members, a goal that should be reached by 31 December 2020 (Memorandum No. 38/CEMGFA/2014 of 30 July). Table 1 shows that this minimum has not been reached. At the end of 2021, the AAFP were understaffed by 6,000 service members (Decree-Law No. 104/2020 of 22 December). However, in comparison to the 32,000 proposed by the CCEM in 2014, the deficit exceeds 7,500 service members.

Table 1 – Staff numbers set out by Decree-Law (DL)

	Proposal of the CCCEM (2014)	2020 (DL 4/2020)	2021 (DL 104/2020)	2022 (DL 6/2022)	Total on effectiveness duty DEZ21	Difference from numbers approved for 2021
Navy	8100	8352	8382	8438	7410	- 972
Army	17765	16071	16078	16091	11203	- 4875
Air Force	6135	6114	6117	6178	5725	-392
Total	32000	30537	30577	30707	24338	-6239

Source: Adapted from the legislation that sets the AAFP staff numbers and from data provided by the Branches.

⁴ Strengths, Weaknesses, Opportunities, Threats.

The legislation that establishes the AAFF staff numbers for each year also aim to “adjust them to the structural needs and planned activities” (Decree-Law No. 7/2018 of 9 February). These regulatory documents contain new activities, which include increasing the participation of the AAFF in fighting forest fires; the “centralised command and management of firefighting air capabilities” (Council of Ministers Resolution No. 157-A/2017 of 27 October); building a Cyber Defence capability or a Military Emergency Response capability to assist in civilian situations, among others (Decree-Law No. 06/2022).

Considering the shortage of human resources and the new activities which the AAFF must conduct, the study will analyse the suitability and stability of the MPU Faculty and assess whether it complies with the minimum requirements defined in the legislation that governs the MPHE.

4.1.2. Faculty suitability⁵

A Faculty is considered suitable when its academic qualifications, level of specialization and staff numbers are appropriate to the number of students and the training provided.

The HPTD is awarded by the IUM through the MPU, within the framework of MPHE, as defined in Art. 7 of Decree-Law No. 17/2019. Art. 40-B of Decree-Law 74/2006 states that the HPTD can only be granted by higher education establishments in which the “Faculty [is] ... qualified and specialized ... “. The same article also states that for a Faculty to be considered qualified, “a minimum of 30% of its members must hold a PhD degree ... or be recognised experts in the core educational area or areas of the relevant study cycle”. While the MPU Faculty has a low percentage of PhDs, as shown in Figure 2, of the 787 teachers who “teach the curricular units” (Almeida, 2022), 290 (36.85% of the total) were recognised as experts by the CTC (Figure 3), which is higher than the 30% required for a Faculty to be considered qualified for the study cycle currently offered by the MPU.

On the other hand, a Faculty is specialised “when ... consists of part-time teachers or visiting teachers whose main professional activity involves the core educational area or areas of the relevant study cycle” (Decree-Law No. 74/2006). According to data from the MPU’s Academic Services Office, even the teachers who are not recognised experts – 63.15% of available teachers – were proposed by the Branches / NRG because they have professional skills relevant to the MPU’s core educational areas. Therefore, the Faculty can be considered specialised.

⁵ As the A3ES’s assessment of the Faculty’s suitability was different from the assessment conducted by the DGES as part of the process to register the HPTC, this study will only address the former.

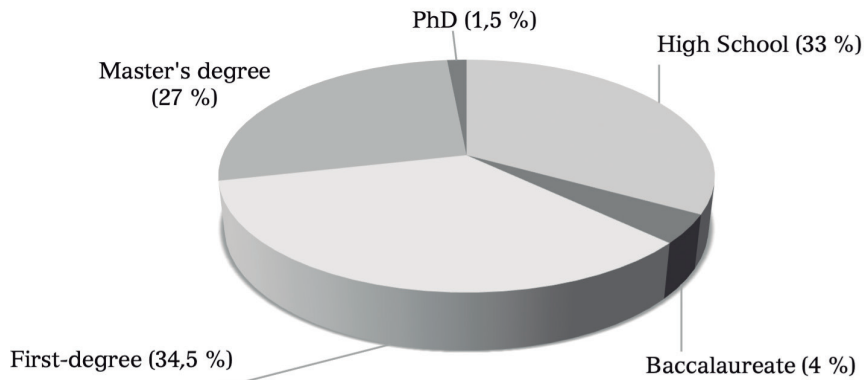


Figure 2 – Academic qualifications of the Faculty

Source: Data provided by B. Ferreira (email, 25 March 2022).

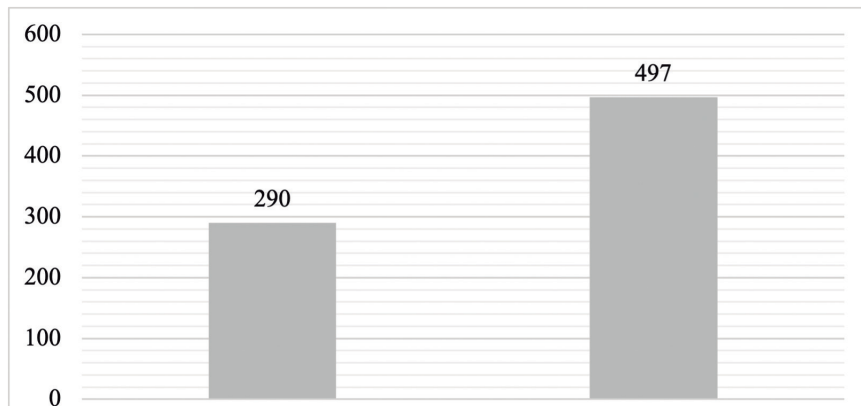


Figure 3 – Percentage of experts and non-experts

Source: Almeida (2022).

The Faculty's suitability in terms of staff numbers (Art. 57 of Decree-Law No. 74/2006) should be assessed in the light of the training provided and the number of students (A3ES, 2017). The data show that the staff numbers is suitable and is even higher than the number of students attending the Higher Professional Technical Course (HPTC) (Figures 4 and 5). Regarding the teachers / student ratio in polytechnic education, Rebelo (videoconference interview, 09 February 2022) states that "in the polytechnic component" of his "area of expertise, economics, management and sociology ... the teachers to student ratio is 1 25". Furthermore, the A3ES has stated that "the standardised ratios defined in the legislation, which other higher education establishments often have difficulty meeting, mainly due to massification, are a significant weakness at the IUM and fall far short of the legally established limits" (2020).

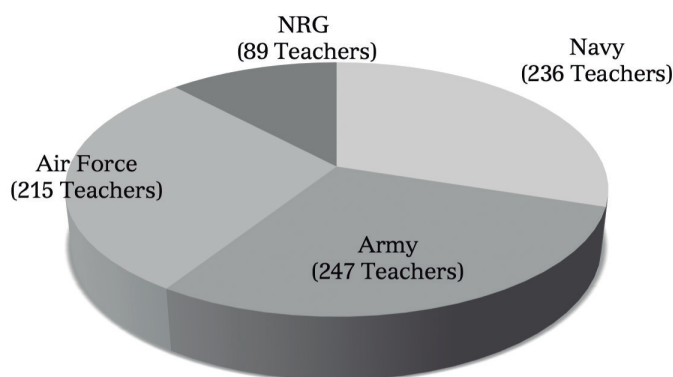


Figure 4 – Teachers by Polytechnic Department

Source: Almeida (2022).

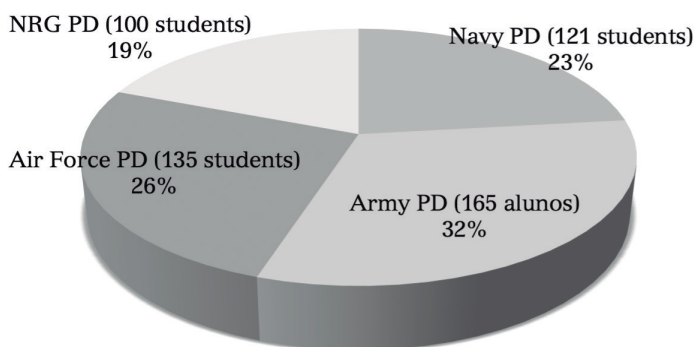


Figure 5 – Students by Polytechnic Department

Source: Data provided by A. Castro (email, 21 January 2022).

4.1.3. Faculty Stability

Organic units of polytechnic education establishments are assessed not only in terms of the Faculty's suitability to the training provided and the lecturer to student ratio, but also in terms of "the Faculty's level of stability" (A3ES, 2017).

According to Almeida (2022), the MPU's educational offer currently includes 50 NTC, which integrate 49 HPTC and 627 Curricular Units (CU). The high number of HPTC and CU is one of the main causes identified by interviewees for the difficulty in managing the Faculty. Furthermore, the number of HPTC and CU implies a high number of teachers, which are difficult to recruit from the AAF, and especially from the staff pool illustrated above. According to the interviewees, many teachers accumulate duties, and military teachers are

often called upon for National Deployed Forces, AAFF missions or tasks, which leads to high turnover rates and instability. Similarly, according to data from the MPU's Polytechnic Studies Office, teaching is often not the main activity of a military lecturer. All military teachers may be sent on missions, asked to participate in meetings related to their service or tasked with operational activities. This poses challenges when allocating and distributing teachers and leads to instability (email, 04 January 2022). Costa (2022) confirms this, stating that the "... regular changes to the Faculty ... hinder its stability".

On the other hand, the high ratio of teachers to students means that there is a 'pool of teachers' who are not currently teaching any classes and can cover for teachers who have been called for other duties. However, replacing these teachers has led to successive changes in the allocation and distribution of the Faculty by CU, creating instability (Santos, email, 04 January 2022).

4.1.4. Brief overview

The collected data shows that there is a shortage of personnel in the Branches, especially in comparison to what the law defines as the minimum staff required for the AAFF. The data showed that the management of the Faculty is hindered by this shortage and by the new activities assigned to the AAFF, such as fighting forest fires. Despite this, the number of military teachers proposed by the Branches / NRG for the MPU is higher than the number of students, which confirms that the Faculty numbers are suitable.

An analysis of the Faculty staff's academic qualifications confirmed that 36.85% are experts recognised by the CTC. This complies with the ratios required by law for MPU's current educational offer (which currently only includes the HPTC). If the MPU's educational offer included a first-degree, 15% of the Faculty should already hold a PhD, as set out in Art. 49 of Law 62/2007. Currently, only 1.5% of the Faculty holds a PhD, as Figure 2 shows.

The MPU Faculty largely consists of teachers (both full-time and part-time) from the AAFF Branches and the NRG, who have been selected for their technical expertise. This confirms that the Faculty is specialised.

However, the same cannot be said about the Faculty's stability. The data gathered from the interviews and from the academic services of the MPU revealed factors that contribute to the instability of the Faculty, such as the high number of HPTC and CU, and especially the fact that most military teachers accumulate duties and are not full time teachers.

Regarding the first specific objective, the analysis revealed that the MPU Faculty staff meets the current needs, has suitable academic qualifications, is specialised, and its numbers are appropriate for the number of students and the type of training provided. However, even though the MPU Faculty meets the current needs, it is not sufficiently stable. This confirms the first research hypothesis. The fact that the MPU Faculty was found to be suitable but not stable also provides an answer to the first subsidiary question.

4.2. Research in the Military Polytechnic Unit

The second specific objective of this study is to analyse the Research conducted at the MPU.

As already mentioned in the conceptual framework, conducting practice based research activities in core areas relevant to the curricula (CNAEF areas 861 and 863) is a part of the MPU's mission and is one of the assessment criteria for polytechnic institutes. The institutional assessment conducted by the A3ES includes an "evaluation of the strategies adopted to provide students with guided research experience early in the courses (A3ES, 2017). In the case of Organic Units such as the MPU, this evaluation includes a general assessment of the guided research work produced in those Units and of the advanced technological and professional development achieved ... in the previous 5 years, including in terms of economic value" (A3ES, 2017). Art. 29 of the MPU's IR states that research activities aim to produce scientific work, provide methodological training to students, and enhance the qualifications of the Faculty staff (Decision No. 2084/2020). According to the IR, guided practice-based research must be conducted in coordination with CIDIU and, when applicable, with the Research Centres of the Autonomous Organic Units (AOU) of the IUM. The MPU's Educational, Scientific and Cultural Project provides a link between the teaching curricula and the research conducted by Teachers and Students to ensure the transfer of technical, methodological, and scientific knowledge.

Therefore, to assess the level of the research conducted in this MPHE establishment, the MPU's HPTC were analysed to determine how they integrate Research in their curricula. Given that all course curricula have a similar structure, a sample was selected from the 49 HPTC offered by the four Polytechnic Departments of the MPU. The analysis revealed that the selected HPTC differed in how they integrate Research in their curricula. The Project CU of the Naval Military Technology - Electromechanics HPTC includes research and analysis methodologies that aim to develop the skills required to research and analyse mechanical technologies; mechanics of materials; thermodynamics and fluid mechanics, and other related topics (IUM, 2020a). The Project Area CU of the Military Aviation Technologies - Assistance and Rescue Systems HPTC includes information on how to conduct research and organize scientific work, and on research methodologies and research, which aim to prepare students to conduct, present and defend a research project that highlights the technical expertise acquired in the course's CUs (IUM, 2020b). The research conducted in the Military Security Technologies - Weapons HPTC focuses on criminal investigation and not on guided research (IUM, 2020c). Currently, the Military Ground Technologies - Infantry HPTC does not have a research component (IUM, 2020d).

Having confirmed that the HPTC of the four Polytechnic Departments differ in how they integrate Research in their curricula, an attempt was made to identify the MPU's avenues of research. However, according to Ferreira (videoconference interview, 30 November 2021), despite the MPU's efforts to establish avenues of research that align with those of the Research Centres of the IUM's AOU, so far, only working documents have been produced, which have not been agreed upon by the Branches and the NRG or approved by the CIDIU.

The fact that there are no approved avenues of research, and thus no research projects, the different approaches to research in the HPTC curricula and the fact that the MPU teachers do not produce scientific work at this time indicate that the MPU has not yet implemented a research model. The MPU activity report for 2020 and the final report of the MPU Director of 26 January 2022, describe Research as a “challenge for the development and consolidation of MPHE” and as “another aspect that must be consolidated” (Costa, 2022). According to the document, of the eleven activities conducted before the activation of the MPU in 2019 and the twenty-two activities conducted after that date, none relate to Research. The delay in the implementation of this process could explain why only a small number of interview answers were related to Research, when compared to the number of answers that addressed the Faculty and the Study Cycles. Ferreira (op. cit.) confirms that research “is still at an embryonic stage” and that, when the MPU was first activated, “research was put in the backburner,” which means that this area “is not consolidated.”

Rebello (op. cit.) argues that, in polytechnic education, the research produced by the Faculty staff is partly funded by private companies. This constitutes an incentive to research. According to Rebello (op. cit.), the teachers of the polytechnic unit teach first-degree and master’s degree classes, in addition to HPTC classes, and are integrated in the University research centres, which support their research activities. The research centres are a point of contact between university and polytechnic researchers, which is a further incentive to research. Rebello (op. cit.) argues that it is difficult to integrate research in the HPTC, as these courses are highly specialised and practice-oriented, but lack a connection to the business world, unlike the first degrees and master’s degrees offered in the polytechnic component.

The head of the Danish AAFF’s level 5 course for NCOs (Jørgensen, videoconference interview, 16 December 2021), which was created in 2019 and accredited in 2020, reported similar difficulties as the former MPU director. According to Jørgensen (op. cit.), in the polytechnic component of the Royal Danish Defence College (RDDC), faculty define the research that will be conducted, as no formal process has been implemented. Furthermore, all research projects are practice based and provide ways to meet the needs identified by the institution. Jørgensen (op. cit.) describes the research model proposed for the MPU as advanced and ambitious and acknowledges that the RDDC model is still in its initial stages of development.

4.2.1. Brief overview

The collected data revealed that conducting practice-based research activities on core areas of the MPU study programmes is a part of the MPU’s mission, as well as one of the assessment criteria for polytechnic institutes. Despite this, the research process has not been fully implemented yet. The second hypothesis of this study – which stated that the research process at MPU is mainly conducted by the Branches / NRG – was not confirmed because this process is at an embryonic stage and is not yet consolidated in the Branches / NRG or the MPU. Therefore, the answer to the second subsidiary question is that the neither the Faculty nor the students produce Research work at the MPU. However, the second specific objective for this research topic was achieved, as the analysis revealed that the MPU’s Research process is still in its initial stages of implementation.

4.3. Study Cycles

The third specific objective of the study is to analyse the need for and purpose of creating a first-degree programme at the MPU.

The literature review revealed that, according to the Status of the AAFP and the NRG, a level 5 qualification is a requirement for admission to the AAFP's NCO CS. The aim of this alteration was to enhance the NCO career, given the growing complexity of the operational environment, and to prepare NCOs to perform the "command, leadership and technical leadership, executive, technical, administrative, logistical and training duties inherent to the military profession" (Decree-Law 17/2019). With the approval of the EMFAR and the Law on the Status of NRG Personnel (EMNRG), it was also decided that the HPTD would be obtained by completing a first-degree programme (Order No. 288/2019). This decision led to the creation of the HPTC, which are integrated in the NTC and aim to provide students with the skills required for the job profiles defined for the NCO category. A job profile was created for each HPTC⁶ associated with the classes, arms, services, and specialties of the NTC of the AAFP and NRG. This profile includes the main activities that job involves, to align the advanced qualifications provided to the functional needs defined by the Branches and the NRG during the statutory review.

As already mentioned in Chapter 2, Decree-Law 17/2019 states that the MPU will only offer the Study Cycles and courses required to prepare students for the missions of the AAFP and the NRG. However, Art. 7 of the same Decree-Law states that the IUM awards first-degrees, master's degrees and the HPTD through the MPU. Art. 36 of Decree-Law No. 17/2019, which refers to the provisions of Law No. 62/2007, states that "the MPU must add first-degree programmes to its training offer" (Costa, 2022) during the installation period.

On the one hand, the creation of first-degree Study Cycles is important for the institutional accreditation of the MPU as a polytechnic higher education establishment. On the other, unlike the level 5 qualification requirement, it is not based on the EMFAR or the EMNRG. Unlike the level 5 qualification requirement, which has a specific purpose defined by law, the job profiles for which these first degrees would provide training are not clear. For Costa (2022), the implementation of first degrees at the MPU will require reflection, as "the education and training provided by the Armed Forces and the NRG aim to meet the institution's needs".

Therefore, the creation of first-degree cycles can be analysed from two perspectives: it has a legislative dimension because the MPU is a higher education establishment (as defined by law) that must comply with certain institutional assessment and accreditation criteria; and it has an organizational dimension (as NCOs must complete a first-degree study cycle, which will be implemented by the MPU), which shows that the Branches and the NRG understand the need for and purpose of creating a first-degree programme for the NCO category.

From the perspective of the legislation that governs higher education, including Decree Law No. 74/2006, creating study cycles that award academic degrees (such as first-degrees) implies stricter requirements than creating HPTC.

⁶ For more information on this process, see Decision No. 4839/2020 of 22 April.

In December 2019, during the phase that preceded the creation of the PhD programme, the IUM underwent a similar institutional assessment process to become a recognised institution, which involved complying with the minimum requirements set out in the law. During this process, the A3ES (2020) considered that the IUM did not fulfil “the requirements for University Institutes according to Art. 43 of Law No. 62/2007” because it did not offer a PhD Study Cycle. The A3ES added that the IUM should reflect on whether it would benefit from offering a PhD programme. As the IUM did not meet an essential requirement to be accredited as a University Institute, the A3ES suggested that it consider becoming recognised as “another type of university establishment”, as defined in Art. 45(1) of Law No. 62/2007. This would release it from the obligation of creating a PhD programme that would meet the requirements for accreditation (A3ES, 2020). The IUM did not meet one of the requirements to be accredited as a University Institute, therefore, the CAE offered an alternative that would allow the Institute to fulfil its mission while complying with the legislation that governs higher education establishments. However, with the creation of the PhD in Military Sciences (Decision No. 3741/2020 of 26 March), it was no longer necessary for the IUM to consider the alternative proposed by the CAE.

After analysing the interviews from an organizational perspective, there were clear differences of opinion regarding the purpose of and need for the creation of first-degree programmes for NCOs at the MPU. A significant percentage of the interviewee sample (47%) does not believe that the MPU should offer first-degree courses because: the MPU was not created for that purpose; the Branches already offer first-degree cycles for the NCO category, which provide access to the Officer category; the issue should be discussed beforehand, within the framework of the EMFAR and the job profiles defined by the AAFB for the NCO category; first-degree cycles are not useful in the initial stages of the NCO career, as they mainly perform duties of a technical nature.

A second group of respondents (27%) believes that these degrees should be created because they are included in the provisions of Decree-Law no. 17/2019, and especially because they will enhance the skills of NCOs and thus improve their job performance.

A third group of interviewees (20%) argues that NCOs should not have to obtain a first-degree during the initial phase of their career, but only as a complement to the HPTC, as part of the Master Sergeant Courses, or to prepare for technical supervisory duties. None of the groups described the job profiles that would be fulfilled by the first-degree cycles.

4.3.1. Brief overview

The collected data revealed that there are two approaches to the third specific objective of the study. According to Law 62/2007, to become an accredited polytechnic institute, the MPU must offer a total of four first-degree programmes, as set out in Art. 44. According to Art. 46 of the same law, this number can be reduced to two during the installation period. However, if the MPU is recognised as a different type of polytechnic higher education establishment, as set out in Art. 45(2) of Law 62/2007 (which is what the A3ES proposed to the IUM during its assessment of the institution) it will only have to create one first-degree.

From an organizational perspective, the opinions of interviewees are divided regarding the purpose and need to create a first-degree for the NCO category. Interviewees argue that there is no need, purpose, or statutory framework for the creation of first-degree cycles, while others argue that a degree that awards more advanced qualifications than the HPTC would provide added value. While the former believes that the HPTC already meet the training needs of the NCO category, as defined in the EMFAR and the EMNRG, the latter see the creation of a first-degree as an opportunity to improve these service members' qualifications and performance.

As the training provided by the MPU's HPTC does not meet all the training needs identified by the Branches and the NRG for the NCO category, the third research hypothesis is only partially confirmed.

The answer to the third subsidiary question is that opinions are divided regarding the creation of first-degree cycles. Those who argue that the HPTC do not meet all the training needs also argue that the first degrees will not only provide training for the job profiles defined by the military (for the HPTC) but will also improve performance without needing to change the duties assigned to these service members. For example, first-degrees will allow the NRG's NCOs to better perform "command and technical supervisory duties in the operational subunits of the national security and protection systems, in order to protect the rule of law, national security and citizens' rights ..." (Decision No. 4839/2020 of 22 April). Those who believe that the HPTC already meet the training needs set out by law argue that no new job profiles have been created, therefore, these first degrees would not serve any purpose.

4.4. How to consolidate Military Polytechnic Higher Education

This study aimed to determine how MPHE can be consolidated. Consolidation is defined as the continuous process to improve or correct the weaknesses or gaps identified in the Faculty, Research and Study Cycles. The answer to the research question is influenced by circumstances external to the MPU, which result from the specificity of MPHE (addressed in Chapter 2) and the applicable legislation (presented in Chapter 1 and explained in this chapter).

To analyse all the data collected from the interviews and the literature review, and to propose measures to consolidate the MPHE model, that is, to answer the research question, a SWOT matrix (Table 2) like the one used by the A3ES (2020) was elaborated. In a second stage, the SWOT matrix was combined with a TOWS situational analysis⁷, according to the model proposed by Weihrich (n.d.), to identify tactical and strategic corrective actions (Table 3).

⁷ Threats, Opportunities, Weaknesses, Strengths.

Table 2 – SWOT analysis

Potentialities (strengths)	Vulnerabilities (weaknesses)
<p>P1. Specificity of the MHES foreseen by law.</p> <p>P2. Purposeful MPHE model, combines organizational with functional structure.</p> <p>P3. Articulation with Branches/NRG.</p> <p>P4. Material resources available in the Branches/NRG, in the Units where the teaching takes place.</p> <p>P5. Qualified Faculty (HPTC), adequate in number (743) and specialized (training areas 861 and 863).</p> <p>P6. High number of recognized specialists in STC's.</p>	<p>V1. Complex management model.</p> <p>V2. Double subordination or accumulation of functions in the MPU.</p> <p>V3. MPHE model still in embryonic phase.</p> <p>V4. Model very dependent on the Branches/NRG.</p> <p>V5. High number of HPTC and CU.</p> <p>V6. Lack of synergies between the four Departments.</p> <p>V7. Lack of civilian teachers for non-strictly military subjects.</p> <p>V8. Insufficient number of doctoral professors.</p> <p>V9. Too many teachers in accumulation of functions.</p> <p>V10. Reduced number of teachers in exclusivity of functions.</p> <p>V11. Unstable Faculty.</p> <p>V12. Incipient research.</p> <p>V13. Lines of investigation are not yet defined.</p> <p>V14. Teachers do not do scientific research</p> <p>V15. Students do not oriented research based on practice</p> <p>V16. There is no structured link to CIDIUM or the Research Centers of the Branches/NRG</p> <p>V17. HPTC study plans of the four polytechnic departments with different approaches to research.</p> <p>V18. MPU does not offer bachelor's degrees, only HPTD.</p> <p>V19. The need and purpose for bachelor's degrees is not defined.</p> <p>V20. Insufficient Faculty ratios for bachelor's degrees.</p>
Opportunities (potential advantages)	Threats (potential difficulties)
<p>O1. Recognition of the specificity of the MHES - Art. 179 Law No. 62/2007 - special ESP.</p> <p>O2. Possibility of concluding protocols, arrangements, bilateral agreements.</p> <p>O3. New MPHE model, in the installation phase.</p> <p>O4. Art. 45 of Law No 62/2007 – requirements of other higher education institutions (one degree only instead of four).</p> <p>O5. No. 2 of Art. 10 of Decree-Law 17/2019.</p> <p>O6. HPTC may serve to continue studies, later in the career of sergeants.</p> <p>O7. There is a favorable opinion for the bachelor's degrees if they arise later in the careers of the Sergeants, are not linked to changes of category, but only to professional valorization, as with the Doctorate of the IUM.</p> <p>O8. EMFAR and EMNRG do not predict for level 6 of the QNQ, for the category of Sergeants, for admission to the permanent staff, only level 5.</p>	<p>A1. Military deficit in the AAFF.</p> <p>A2. Awareness deficit in AAFF that new paradigm of MPHE obeys the rules of PHES and not those of the professional training of the Branches / NRG.</p> <p>A3. Short installation period (3 years).</p> <p>A4. New tasks assigned to AAFF that require more Human Resources.</p> <p>A5. Accumulation of functions.</p> <p>A6. Legal requirements that are difficult to comply with - Art. 44, 46 and 49 of Law No. 62/2007.</p> <p>A7. Lack of resources and authorization to hire civilian teachers for non-strictly military subjects.</p> <p>A8. Lack of consensus as to the purpose or need for bachelor's degrees.</p> <p>A9. Non-compliance of IR regarding the management of military teachers.</p> <p>A10. MPU not accredited.</p>

Source: Adapted from the version used by the A3ES (2020).

Table 3 – TOWS Matrix

<p>P-O: Use internal potentialities to take advantage of external opportunities</p> <ol style="list-style-type: none"> 1. IUM consider the MPU according to Art. 45 of Law No. 62/2007, as another polytechnic higher education institution and not as a polytechnic institute. 2. Create a working group to design a single, optional graduate model, taking advantage of the <i>European Credit Transfer and Accumulation System</i> (ECTS) of the HPTC, trying to answer questions such as: at what stage of the career? For what purpose? What is the area of fundamental interest? 3. Propose extension of the installation period, within the framework of the specificity of the ESM provided for in the law. 	<p>O-V: Use opportunities to overcome vulnerabilities</p> <ol style="list-style-type: none"> 1. Celebrate arrangements or protocols for civilian teachers. 2. Stimulating research in the Faculty. 3. Create a module of practice-based research methodologies for Faculty. 4. Create a working group, dedicated to the development of the research process, involving the four Polytechnic Departments, and sponsored by CIDIUM, with the objective of standardizing the approach between Ramos/NRG and defining the Lines of Investigation. 5. Stimulate the participation of students in research projects, in the areas of knowledge in which the MPU is organized and in coordination with CIDIUM. 6. Stimulate communication and dissemination of research activities.
<p>P-A: Use potentialities to mitigate threats</p> <ol style="list-style-type: none"> 1. Design general and scientific semester with a common and a specific part (like the Field Grade Officers Course). 2. Promote new awareness actions at the level of the human resources management departments of Ramos/NRG, on a new paradigm in the training of Sergeants. 	<p>V-A: Strategies to mitigate internal vulnerabilities and minimize external threats</p> <ol style="list-style-type: none"> 1. Strengthen the portfolio of eventual teachers.⁸ 2. Hire civilian teachers for non-strictly military subjects. 3. Ramos/NRG should seek to keep the military in the teaching function for at least three years, as agreed in the MPU IR. 4. Branches /NRG transfer teachers only at the end of the school year, promoting stability. 5. Create synergies between Departments. 6. Ramos/NRG recognize and value the teaching function. 7. Create incentives for teaching. 8. Minimize turnover. 9. Invest in the creation of a dedicated Faculty (forming Sergeants – degree dedicated to teaching) - at a certain stage of the career of the military (from Master-Sergeant). 10. Develop research process under the tutelage/ sponsorship of CIDIUM, in the polytechnic aspect.

Source: Adapted from the situational analysis proposed by Heinz Wehrich (1982).

⁸ At this time, having a pool of potential teachers would allow the MPU to manage the successive changes resulting from the service obligations of military teachers.

This analysis revealed that the MPU Faculty is suitable in terms of qualifications, specialisation, and staff numbers. However, it is not sufficiently stable. The instability of the Faculty is an internal weakness that results from external threats, such as the shortage of personnel in the AAFF, the accumulation of duties or the lack of knowledge regarding the fact that MPHE is governed by the regulatory framework of the MHES, not by the regulations of the professional training provided in the Branches / NRG for the NCO category. Therefore, the following measures should be taken to address internal weaknesses and minimize the effects of external threats:

- Coordinating with the Branches / NRG to increase the “pool of potential teachers,” that is, the universe of military teachers who meet the requirements.

- Continuing to hire civilian teachers to teach subjects that are not strictly military (which is already a frequent practice at the IUM) to meet the needs identified by the former MPU Director (Costa, 2022, p. 9).

- Informing the Branches / NRG of the need to keep service members on teaching duties for at least three years, pursuant to Art. 51(1) of the MPU IR (Decision No. 2084/2020).

- Advising the Branches / NRG to wait for the end of the school year to transfer military teachers, as this will increase the stability of the Faculty during that semester.

- Creating linkages between Departments to promote the sharing of military teachers.

- Advising the Branches / NRG on the importance of improving the qualifications of the Faculty staff.

- Providing teaching incentives.

- Creating a full time military Faculty in coordination with the Branches / NRG. In the academic training model of the Danish AAFF, the Faculty is composed of senior NCOs, who must have a level 6 qualification (Jørgensen, op. cit.).

The analysis of the Research conducted at the MPU revealed that the process has been initiated but is still in its initial stages, and it is not yet consolidated in the Branches / NRG or the MPU (Ferreira, op. cit.). The fact that the MPU is still building its capabilities and does not yet offer first-degree cycles hinder the development of the Research process. This delay in the process of implementation of the Research component constitutes a weakness. However, the fact that MPHE is a new model which is still being implemented also provides an opportunity to adapt the Research process to the MPU’s current training offer. Therefore, the following measures can be implemented to accelerate the development of the structure and processes required to conduct Research:

- Creating a working group to manage the implementation of the Research process, which should include representatives from the four Polytechnic Departments and be sponsored by the CIDIUM, to define avenues of research and standardise, as much as possible, the approach to Research in the HPTC curricula.

- Encouraging the MPU Faculty staff to conduct Research by creating a module on practice-based research methodologies and holding training sessions on the research process.

- Encouraging Faculty staff and students to participate in research projects on the MPU’s core areas of expertise, in coordination with the CIDIUM.

- Advertising these Research activities both internally and externally.
- Holding a seminar on the research conducted in polytechnic establishments, focusing on sharing the experiences of the Branches / NRG.

The Study Cycles were analysed from a legislative and an organizational perspective. Law 62/2007 states that the MPU's educational offer can include one, two or four first degrees, depending on which article is considered applicable to the current MPHE model. Decree-Law No. 17/2019 confirms this but allows for different interpretations regarding the need for the creation of first degrees in the MPU.

As the specificity of MPHE is considered a strength and the legal framework should be seen as an external opportunity and not as a threat, the following measures can be taken to make the most of the legislation that governs MPHE:

- As the A3ES suggested before the creation of the PhD in Military Sciences, the IUM should reflect on Art. 45(2) of Law 62/2007, according to which the MPU can be recognised as a different type of polytechnic higher education establishment, rather than as a polytechnic institute.
- The IUM should establish a working group (as it did when the PhD was created) to prepare a first-degree model which NCOs could attend as part of their (optional) complementary studies, using the credits obtained in the HPTC.
- The IUM should consider extending the MPU's period of installation, which is a possibility provided by law due to the specificity of the MHES. The Danish AAFF have a level 5 academic programme that has been accredited for a period of five years, after which the AAFF must prove that the chosen model is becoming consolidated (Jørgensen, op. cit.).

5. Conclusions

The fact that the NCOs of the AAFF and the NRG are eligible for admission to the CS after obtaining a level 5 qualification awarded by a higher education establishment is a fundamental shift. With these changes, the training provided to NCOs now falls under the national qualifications framework. Until now, the training provided in the Schools / Training Centres of the Branches and the NRG was assessed under the professional qualification's framework. In 2019, the MPU was tasked with providing a level 5 course for NCOs, under the framework of the MPHE. The MPU is integrated in the MHES and is subject to the laws that govern Portuguese higher education and to the specificities of the military profession. The installation period of the MPU will end in 2023, and its consolidation is important not only for the NCO category, the AAFF and the NRG, but also for the institutional accreditation of the IUM. The general objective of this study was to propose guidelines to consolidate MPHE in Portugal, considering the specific requirements of the MHES and the legislation applicable to it.

To that end, a hypothetical-deductive methodology, a mixed strategy, and a case study research design were chosen for the study. Hypotheses were formulated to guide the research and data were collected through a literature review and semi-structured interviews to experts who perform roles relevant to the study topic.

The study revealed that the MPU Faculty is suitable in terms of academical qualifications, specialization, and staff numbers, given the number of students and the training provided by the MPU, which currently only includes the HPTC. However, the Faculty does not meet the requirements of a first-degree study cycle. Specifically, the number of full-time teachers who hold PhDs is clearly lower than the 15% requirement set out in Art. 49(1)(c) of Law No. 62/2007.

On the other hand, the study also revealed that, despite being suitable, the Faculty is not sufficiently stable due to the high number of HPTC and CU, and to the fact that most military teachers also perform other tasks in the Branches and the NRG and are not assigned to the MPU on a full-time basis. This instability not only poses challenges when managing the Faculty, but also hinders the MPU's activities and the quality of the teaching provided.

Second, the collected data showed that the Research conducted at the MPU it is still in its preliminary stages. Even though conducting practice-based research activities is one of the tasks assigned to the MPU and is one of the assessment criteria for polytechnic institutes, the Polytechnic Departments do not agree on what these activities imply and how they should be implemented. The Research process is not yet consolidated, and neither the Faculty staff nor the students conduct research activities.

Regarding the Study Cycles, opinions were divided between those who believe that the current HPTC already meet the training needs of the NCO category, which are defined in the EMFAR and the EMNRG, and those who see the new degrees as an opportunity to improve professional skills and performance. Those who argue that the HPTC do not meet all training needs also argue that the first degrees will provide training for the job profiles already defined for the HPTC, as well as improve performance without needing to change the duties assigned to these service members. Those who argue that the HPTC already meet the training needs identified in the legislation also argue that no new professional profiles have been created.

Aside from these differences of opinion, the study confirmed that the MPU is required by law to offer first-degree study cycles, either as a polytechnic institute or as a different type of polytechnic higher education establishment. The MPU will be required to create between one and four first-degree cycles, depending on which article of Law 62/2007 the IUM decides that the MPU should fall under (Art. 44 or 45). Furthermore, as was suggested by the A3ES during the institutional assessment of the IUM, the law allows a higher education establishment to temporarily adjust its level of ambition without compromising its mission.

This study focused on three research topics and on the regulatory framework of the higher education system. Therefore, it provides a relevant contribution to the knowledge about the current MPHE model, about the fundamental shift that it represents, as well as about its complex implementation process. The courses offered at the MPU are not taught in a specific location, and depend on the support of the AAFF and the NRG, in coordination with the Polytechnic Departments. The MPU provides training to the personnel of the AAFF and the NRG through the Polytechnic Departments. As the students come from the NCO classes, arms, services, and specialties of the AAFF and NRG, the number of courses and curricular units required to train them is difficult to manage. Like the specific requirements of the military

profession, this specific feature of MPHE is recognised by law and by the organizations that assess and accredit the MPU and its study cycles. Therefore, there is a window of opportunity to correct gaps that hinder the accreditation of the MPU as a polytechnic institute or even as a different type of polytechnic higher education establishment.

One limitation of this study is the fact that it was elaborated while the first NTC taught according to the new model are still in progress, halfway through the installation period of the MPU, which will end in 2023. Therefore, it would be best to wait for the conclusion of the first HPTC in July 2022 to continue the analysis that this study began. As the research content had to be delimited, the study focused on three key concepts for higher education. However, Art. 4 of Law No. 38/2007 defines twenty-eight “quality criteria to assess the performance of higher education establishments”. Therefore, future studies should analyse other criteria, such as teaching methodologies or teaching quality.

Despite the above limitations, the study revealed what must be done to consolidate the current MPHE model and correct its weaknesses. A list of tactical and strategic corrective actions is proposed at the end of Chapter 4. The study recommendations consist of three proposals to consolidate the MPU (which is the general objective of this study):

– The MPU must increase the stability of its Faculty. To do this, the Branches / NRG should try to see the MPU as an institution that falls under the national qualifications framework, rather than the traditional framework that governs military training, and implement the proposals listed in Chapter 4 regarding the management of the military Faculty.

– The MPU must conduct Research to be accredited. Therefore, it must develop a Research model adapted to the specific needs of the HPTC, in coordination with the CIDIUM and, when needed, with the research centres of the IUM’s AOU.

– The MPU must offer first-degree study cycles to be accredited. However, due to the legally recognised specificity of the MHES, it can choose the number, training areas and timing to implement them. The best course of action would be for the MPU to be considered a different “polytechnic higher education establishment,” as defined in Art. 45 of Law 62/2007, because this would allow it to offer only one first-degree rather than two or four. After the Branches and the NRG agree on the purpose and aim of creating a first-degree for NCOs, they should define the training areas and specialties of this first-degree cycle according to the provisions of Art. 5 of Decree-Law 17/2019. Another recommendation of this study is that the first-degree serve that is created serve to prepare senior NCOs to become full-time teachers at the MPU, as this will increase the Faculty’s stability. Finally, bearing in mind the legally recognised specificity of the MHES, the deadline to create a first degree study cycle should be extended to ensure that the process is continuous, sustainable, and that it serves the best interests of the AAFF and the NRG, given the growing complexity of the operational environment.

It is precisely due to this operational complexity, and, as Nelson Mandela stated in 1990, to the intrinsic value of Education, that the AAFF and the NRG must reach an agreement on how to consolidate the Portuguese MPHE model, based on the measures proposed in this study.

References

- Agência de Avaliação e Acreditação do Ensino Superior. (2017). *Guião para elaboração do relatório de avaliação institucional*. [Online]. Retrieved from <https://www.a3es.pt/pt/acreditacao-e-auditoria/guioes-e-procedimentos/avaliacao-institucional>
- Agência de Avaliação e Acreditação do Ensino Superior. (2020). *AINST/16/00034 - Relatório final da Comissão de Avaliação Externa*. [Online]. Retrieved from <https://www.a3es.pt/pt/resultados-acreditacao-94>
- Agência de Avaliação e Acreditação do Ensino Superior. (2021). *CrITÉrios de qualificação de Pessoal Docente para a acreditação de ciclos de estudos*. Lisbon: Author.
- Agência de Avaliação e Acreditação do Ensino Superior. (s.d.). *Glossário da A3ES*. [online]. Retrieved from <https://www.a3es.pt/pt/documentos/documentos/glossario>
- Almeida, D. (2022). *Relatório de situação 01 de abril de 2022*. Lisbon: Military University Institute - Military Polytechnic Unit.
- Borges, V. (2014). A Reforma do Ensino Superior Militar em Portugal. *Revista Militar* (5), 811-824.
- Borges, V. (2021). Ensino Superior Militar em Portugal: carreiras, doutoramento e especificidade militar. *Revista Militar* (2628), 31-41.
- Borges, V., Fernandes, H., Rodrigues, F., Marreiros, J., & Pires, N. (2014). A reforma do ensino superior militar em Portugal. *Revista Militar* (2553), 811-824.
- Constitutional Law No. 1/2005 of August 12. (2005). *Seventh Constitutional Revision*. Diário da República, 1ª Série, 155, 4642-4686. Lisbon: Portuguese Parliament.
- Costa, S. (2020). *Unidade Politécnica Militar: Plano Estratégico 2020*. Lisbon: Military University Institute.
- Costa, S. (2021). *Apresentação ao CESM: Unidade Politécnica Militar*. Lisbon: Military University Institute.
- Costa, S. (2022). *Relatório final do Diretor da Unidade Politécnica Militar*. Lisbon: Military University Institute - Military Polytechnic Unit.
- Council of Ministers Resolution No. 157-A/2017 of October 27. (2017). *Approves structural changes to the system of preventing and fighting forest fires*. Diário da República, 1ª Série, 208, 2-5. Lisbon: Presidency of the Council of Ministers.
- Council of Ministers Resolution No. 26/2013 of April 19. (2013). *Approves the guidelines for the implementation of the structural reform of the national defence and the Armed Forces, called Reforma «Defesa 2020»*. Diário da República, 1.ª Série, 77, 2285-2289. Lisbon: Presidency of the Council of Ministers.
- Decree-Law No. 104/2020 of December 22. (2020). *Defines the Armed Forces personnel for 2021*. Diário da República, 1ª Série, 247, 4-10. Lisbon: Presidency of the Council of Ministers.
- Decree-Law No. 30/2017 of March 22. (2017). *Approves the Statute of the Military of the Republican National Guard*. Diário da República, 1.ª Série, 58, 1507-1550. Lisbon: Ministry of Internal Affairs

- Decree-Law No. 65/2018 of August 16. (2018). *Amends the legal regime for higher education degrees and diplomas*. Diário da República, 1.ª Série, 157, 4147-4182. Lisbon: Presidency of the Council of Ministers.
- Decree-Law No. 7/2018 of February 09. (2018). *Sets the personnel of the Armed Forces, in all situations, for the year 2018*. Diário da República, 1.ª Série, 29, 898-901. Lisbon: Ministry of National Defense.
- Decree-Law No. 74/2006 of March 24. (2006). *Approves the legal regime for higher education degrees and diplomas*. Diário da República, 1.ª Série, 60, 2242-2257. Lisbon: Ministry of Science, Technology and Higher Education.
- Decree-Law No. 90/2015 of May 29. (2015). *Statute of the Military of the Armed Forces*. Diário da República, 1.ª Série, 104, 3198-3253. Lisbon: Ministry of National Defense.
- Decree-Law No. 17/2019 of January 22. (2019). *Regulates the Military Polytechnic Unit and enshrines the specificities of the polytechnic component of military higher education in the context of polytechnic higher education*. Diário da República, 1.ª Série, 15, 462-468. Lisbon: Presidency of the Council of Ministers.
- Decree-Law No. 249/2015 of October 28. (2015). *Approves the organic of military higher education, consecrating its specificities in the context of higher education, and approves the Statute of the Military University Institute*. Diário da República, 1.ª Série, 211, 9298-9311. Lisbon: Ministry of National Defense.
- Decree-Law No. 29/2021 of April 28. (2021). *Amends the organic of military higher education and the Statute of the Military University Institute*. Diário da República, 1.ª Série, 82, 7-12. Lisbon: Presidency of the Council of Ministers.
- Decree-Law No. 31/2015 of March 4. (2015). *Sets the armed forces for the year 2015*. Diary of the Republic, 1.ª Série, 44, 1304-1308. Lisbon: Ministry of National Defense.
- Decree-Law No. 37/2008 of March 5. (2008). *Applies to military public higher education Decree-Law No. 74/2006 of March 24, which establishes the legal regime for higher education degrees and diplomas*. Diário da República, 1.ª Série, 46, 1382-1387. Lisbon: Ministry of National Defense.
- Decree-Law No. 48/86 of March 13. (1986). *Defines a legal framework that regulates the institutional relationship of military higher education schools with establishments that integrate the Portuguese university system*. Diário da República, 1.ª Série, 60, 608-609. Lisbon: Ministry of National Defense.
- Decree-Law No. 6/2022 of January 7. (2022). *Sets the armed forces' staff for the three-year period 2022-2024*. Diário da República, 1.ª Série, 5, 10-22. Lisbon: Presidency of the Council of Ministers.
- Decree-Law No. 63/2016 of September 13. (2016). *Creates the diploma of professional superior technician and makes the second amendment to Decree-Law No. 64/2006, of March 21, to the fourth amendment to Decree-Law No. 74/2006 of March 24, and the first amendment to Decree-Law No. 113/2014, of July 16*. Diário da República, 1.ª Série, 176, 3159-3191. Lisbon: Ministry of Science, Technology and Higher Education.

- Decision No. 2084/2020 of 13 February. (2020). *Internal Regulations of the Military Polytechnic Unit*. Journal of the Republic, 2nd Series, 31, 52-70. Lisbon: Ministry of National Defence.
- Decision No. 3741/2020 of March 26. (2020). *Creation of the PhD in Military Sciences*. Diário da República, 2.ª Série, 61, 138-139. Lisbon: National Defense - General Staff of the Armed Forces - Military University Institute.
- Decision No. 4839/2020 of April 22. (2020). *Notes the creation of the professional higher technical course of Military Security Technologies - Weapons, of the Military Polytechnic Unit of the Military University Institute*. Diário da República, 2.ª Série, 79, 75-81. Lisbon: Directorate-General for Higher Education.
- Decision No. 5675/2020 of May 21. (2020). *Records the creation of the professional higher technical course of Aeronautical Military Technologies - Electromechanics of the Military Polytechnic Unit of the Military University Institute*. Diário da República, 2.ª Série, 99, 147-154. Lisbon: Directorate-General for Higher Education.
- Decision No. 7234-A/2014 of June 2. (2014). *Complementary Ministerial Directive for Structural Reform in National Defence and the Armed Forces*. Diário da República, 2.ª Série, 105, 2-3. Lisbon: Ministry of National Defence - Office of the Minister.
- Decision No. 167/CEMGFA/2019 of December 3. (2019). *Activation of the Military Polytechnic Unit*. Lisbon: General Staff of the Armed Forces.
- Decision No. 32/2020 of May 26. (2020). *Definition of units, establishments or organs that articulate with the polytechnic department of the Air Force*. Alfragide: Chief of Staff of the Air Force.
- Direção-Geral do Ensino Superior. (2019). *20º Aniversário do Processo de Bolonha*. [online]. Retrieved from: <https://www.dges.gov.pt/pt/noticia/20o-aniversario-do-processo-de-bolonha>
- Direção-Geral do Ensino Superior. (2021). *Sistema de Ensino Superior Português*. [online]. Retrieved from <https://www.dges.gov.pt/pt/pagina/sistema-de-ensino-superior-portugues>
- Direção-Geral do Ensino Superior. (s.d.). *Curso técnico superior profissional - CTESP*. [online]. Retrieved from: <https://www.dges.gov.pt/pt/pagina/curso-tecnico-superior-profissional-ctesp>
- Ferreira, B. (2021). *Apresentação ao General CPESFA: Unidade Politécnica Militar*. Lisbon: Military University Institute.
- Instituto Universitário Militar, Unidade Politécnica Militar. (2020a). *Processo Curso Técnico Superior Profissional - Tecnologias Militares Navais - Eletromecânica*. Lisbon: Author.
- Instituto Universitário Militar, Unidade Politécnica Militar. (2020b). *Processo Curso Técnico Superior Profissional - Tecnologias Militares Aeronáuticas - Sistemas de Assistência e Socorro*. Lisbon: Author.
- Instituto Universitário Militar, Unidade Politécnica Militar. (2020c). *Processo Curso Técnico Superior Profissional - Tecnologias Militares de Segurança – Armas*. Lisbon: Author.
- Instituto Universitário Militar, Unidade Politécnica Militar. (2020d). *Processo Curso Técnico Superior Profissional - Tecnologias Militares Terrestres - Infantaria*. Lisbon: Author.

- Instituto Universitário Militar. (2020). *Unidade Politécnica Militar - Relatório de atividades de 2020. Relatório do Diretor da UPM*. Lisbon: Author.
- Law No. 11/89 of June 1 (1989). *Basic Law on the Status of the Military Profession*. Diário da República, 1.^a Série, 125, 2096-2097. Lisbon: Portuguese Parliament.
- Law No. 62/2007 of September 10. (2007). *Legal regime of higher education institutions*. Diário da República, 1.^a Série, 174, 6358-6389. Lisbon: Assembly of the Republic.
- Law No. 38/2007 of August 16. (2007). *Approves the legal regime for higher education assessment*. Diário da República, 1.^a Série, 157, 5310-5310. Lisbon: Assembly of the Republic.
- Mandela, N. (1990). *Education is the most powerful weapon*. [online]. Retrieved from <https://pgc.edu/education-is-the-most-powerful-weapon/>
- Meirinho, M., & Osório, A. (2010). *O estudo de caso como estratégia de investigação em educação*. Retrieved from https://www.researchgate.net/publication/259338491_O_Estudo_de_caso_como_estrategia_de_investigacao_em_educacao
- Memorandum No. 38/CEMGFA/2014 of 30 de junho. (2014). *Military Personnel Of The Armed Forces – Reforma “Defesa 2020”*. Lisbon: General Staff of the Armed Forces.
- Ministério da Defesa Nacional. (2015). *Defesa “2020”*. [online]. Retrieved from https://www.defesa.gov.pt/pt/comunicacao/documentos/Lists/PDEFINTER_DocumentoLookupList/Defesa-2020.pdf
- Normative Decision No. 18/2021 of July 7. (2021). *Approves the rules applicable to the qualification process as a specialist of recognized experience and professional competence in the field of Military Polytechnic Higher Education*. Diário da República, 2.^a Série, 130, 46-48. Lisbon: Minister of National Defence.
- Ordinance No. 288/2019 of September 3. (2019). *Regulates the Level 5 Qualification Award Scheme - Sergeants Training Course*. Diário da República, 1.^a Série, 168, 70-76. Lisbon: Internal Administration, Science, Technology and Higher Education and National Defense.
- Quivy, R., & Campenhoudt, L. V. (1998). *Manual de Investigação em Ciências Sociais*. Lisbon: Gradiva.
- Rego, A., Cunha, M. P., & Meyer Jr., V. (2018). Quantos participantes são necessários para um estudo qualitativo? Linhas práticas de orientação. *Revista de Gestão dos Países de Língua Portuguesa*, 45-57.
- Santos, L. B., & Lima, J. M. (Coords.) (2019). *Orientações Metodológicas para a elaboração dos trabalhos de investigação*. (2nd ed., revised and updated). Cadernos do IUM, 8. Lisbon: Military University Institute.
- Wehrich, H. (1982). The TOWS matrix - A tool for situational analysis. *Long Range Planning*, 15(2), 54-66. [https://doi.org/10.1016/0024-6301\(82\)90120-0](https://doi.org/10.1016/0024-6301(82)90120-0)