

# DESIGNING AN ASSESSMENT AND QUALITY ASSURANCE INTEGRATED SYSTEM FOR THE MILITARY UNIVERSITY INSTITUTE<sup>1</sup>

## EDIFICAÇÃO DO SISTEMA INTEGRADO DE AVALIAÇÃO E QUALIDADE DO INSTITUTO UNIVERSITÁRIO MILITAR

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### Abstract

Internal quality assurance plays a structuring and integrating role in national higher education institutions. Portuguese military higher education institutions have shown that they have the quality assurance mechanisms required to accredit their study programmes. However, these mechanisms have not yet been integrated into a common internal quality assurance system that includes both the Military University Institute and its schools.

This study proposes guidelines to design an internal quality assurance system that includes the Military University Institute's schools and complies with the requirements of the Portuguese Agency for Assessment and Accreditation of Higher Education.

The methodology used for this study included a qualitative strategy, semi-structured interviews with quality managers from Portuguese military and civilian education institutions, as well as from European institutions similar to the IUM, and a case study research design.

The study findings consist of a set of guidelines, which correspond to distinctive features of the internal quality assurance system and the challenges that must be addressed during its implementation. These guidelines are based on the systems used by the analysed institutions, adapted to the specificities of military higher education.

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**Keywords:** Military Higher Education; Quality Assurance in Higher Education; Military University Institute; Internal Quality Assurance System..

## **Resumo**

*A garantia interna da qualidade é, atualmente, um elemento estruturante e integrador das instituições de ensino superior nacionais. As instituições nacionais de ensino superior militar têm demonstrado possuir mecanismos de garantia da qualidade, no âmbito da acreditação dos seus ciclos de estudos. Porém, estes mecanismos não estão ainda integrados num sistema interno de garantia da qualidade, agregador do Instituto Universitário Militar e das suas unidades orgânicas.*

*O estudo tem por objetivo propor contributos para a edificação do sistema interno de garantia da qualidade do Instituto Universitário Militar, integrando as suas unidades orgânicas e cumprindo com os requisitos definidos pela Agência de Avaliação e Acreditação do Ensino Superior.*

*Em termos metodológicos, optou-se por uma estratégia qualitativa, com recurso a entrevistas semiestruturadas a responsáveis da qualidade de instituições militares e civis nacionais, e de congêneres militares europeias e um desenho de pesquisa do tipo estudo de caso.*

*Como resultado da investigação, apresenta-se um conjunto de contributos, consubstanciados em elementos caracterizadores do sistema interno de garantia da qualidade e constrangimentos a mitigar no decurso da sua implementação, baseados nos sistemas existentes nas instituições analisadas e adaptados à especificidade do ensino superior militar.*

**Palavras-chave:** *Ensino Superior Militar; Garantia da Qualidade no Ensino Superior; Instituto Universitário Militar; Sistema Interno de Garantia da Qualidade.*

## **1. Introduction**

Decree-Law No. 249/2015 of 28 October, which approves the organizational structure of military higher education (MHE) institutions and the status of the Military University Institute (IUM), reflects a concern with improving the quality of teaching and research. The decree states that this Higher Education Institution (HEI) is responsible for “[...] creating procedures and instruments that allow it to conduct internal assessments and improve its quality and accountability, in compliance with Portuguese and international standards”. It also states that the IUM’s Assessment and Quality Office is responsible for coordinating all quality control activities and processes, as well as for supervising the process through which the IUM and its teaching and research units are assessed and accredited by the Portuguese Agency for Assessment and Accreditation of Higher Education (A3ES).

Currently, the IUM schools have dedicated Internal Quality Assurance Systems (SIGQ), which are mostly autonomous, with some exceptions, such as the A3ES accreditation process and the registration of study programmes with the Directorate-General for Higher Education (DGES).

The IUM and its schools are part of the Portuguese higher education system and, as such, they must comply with the standards for quality assurance in higher education (Law No. 38/2007 of 16 August). The IUM and its schools have been assessed by A3ES during the accreditation of the institution and its study programmes, as set out in the law on higher education degrees and diplomas (Decree-Law No. 74/2006 of 24 March). The final report of the institutional assessment carried out by the A3ES External Assessment Team (EAT) in 2018 mentions the following points:

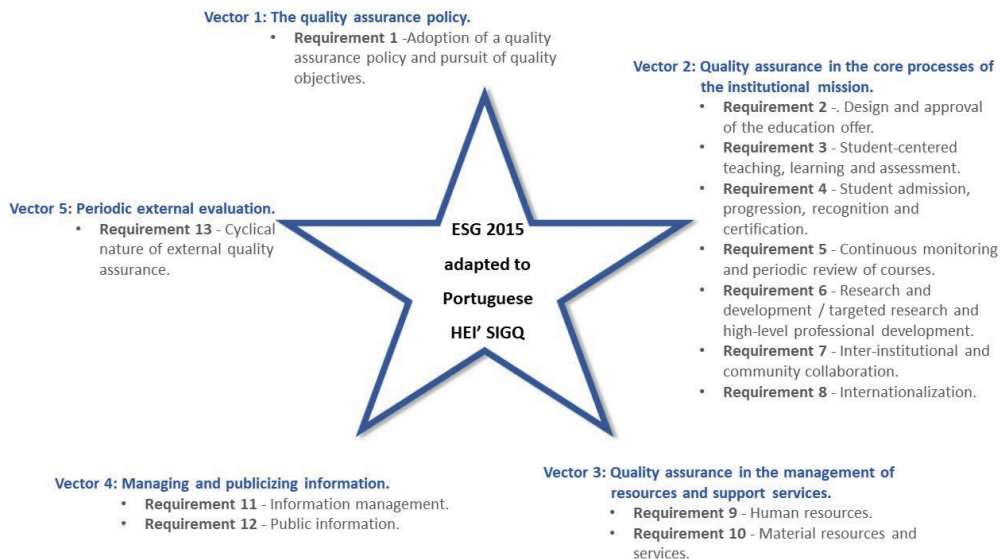
[...] Internal quality assurance system defined by the Institution, not yet certified by A3ES [...] as soon as possible, a single internal quality assurance system that covers the whole Institute should be defined [...]

Recommendations for improvement [taken from the global assessment of the institution]:

Designing an internal quality assurance system that includes the IUM schools and ensures that the Institute operates at a high level of quality; [...]

Improving the functional integration of the schools and harmonising the flow of information between them [...]. (A3ES, 2018a, pp. 3, 17, 21)

According to the A3ES strategic plan (2021c, p. 30), the process to certify the SIGQ (which is based on the A3ES benchmarks shown in Figure 1) should be integrated into the operation of HEI and included in the institutional assessment.



**Figure 1 – Vectors and requirements used to certify the SIGQ of Portuguese HEI (based on the European standards and guidelines for higher education institutions for 2015 [ESG])**

The topic of this study is especially relevant because the next institutional assessment of the IUM will take place in 2024 and the SIGQ may have to be certified by that time.

The general objective of the study is to propose guidelines to design a SIGQ for the IUM and its schools, in compliance with the quality standards for higher education establishments. The general objective was divided into specific objectives:

- i. To analyse the Distinctive Features (DF) of SIGQ and the challenges to their implementation which are highlighted in the literature;
- ii. To analyse the SIGQ used by the IUM and in similar European higher education institutions;
- iii. To analyse the certified SIGQ of Portuguese universities and university institutions.

The research question is how to design a SIGQ for the IUM that complies with the quality standards for higher education institutions and includes all its schools.

## **2. Theoretical and conceptual framework and methodology**

This chapter contains the literature review and the key concepts.

### **2.1. Literature review and key concepts**

The key concept of this study is a SIGQ that meets the requirements set by A3ES, which are based on the principles of quality (in higher education) (A3ES, n.d.). This chapter will begin by explaining the concept and elements of a SIGQ in the context of European higher education, and describe how it is applied in Portuguese higher education institutions.

#### **2.1.1 Quality in European higher education**

Quality in higher education was at the centre of the Bologna process, particularly after the meeting of European ministers responsible for higher education in their countries, which took place in Berlin in 2003. In the Berlin Communiqué (Bologna Process Ministerial Conference [BPMC], 2003), the ministers agreed that quality in higher education was vital to the creation of the European Higher Education Area and pledged to support the development of quality assurance processes at all levels (institutional, national and European). They also stressed that HEI have the primary responsibility for quality assurance in higher education.

During the ministerial conference in Berlin, the European Association for Quality Assurance in Higher Education (ENQA) was asked to create a set of standards, procedures and guidelines for quality assurance in higher education, in coordination with the European University Association (EUA), the European Association of Institutions in Higher Education (EURASHE) and the National Unions of Students in Europe (ESIB) (BPMC, 2003).

According to Santos (2011, p. 5), the aspects defined at the Berlin Conference include the following quality assurance requirements:

- All the institution's activities are assessed internally, using feedback to improve quality.
- All stakeholders are involved in the process.
- A quality policy and institutional procedures.
- External assessments to ensure that the assessment process is independent.

Based on the decisions that came out of the Berlin Conference, the ENQA, EUA, EURASHE and ESIB (with the participation of government representatives) created the first standards and guidelines for quality assurance in higher education, which were approved at a ministerial meeting held in 2005, in Bergen (BPMC, 2005). The resulting document was titled *Standards and Guidelines for Quality Assurance in the European Higher Education Area - ESG 2005*.

The ESG 2005 was organized in three sections: the first addressed quality assurance in HEI (Table 1), the second focused on external quality assurance (assessment) of HEI by national assessment agencies, and the third addressed the external assessment of those agencies (ENQA, 2005).

After ESG 2005 was implemented at European level, the document had to be reviewed (ENQA, 2011). The review was published in a document titled ESG 2015, which was adopted at the annual meeting of ministers responsible for higher education in Europe, held in Belarus in 2015 (BPMC, 2015). The new reference points are listed in Table 1 (ENQA, European Student's Union, EUA, & EURASHE, 2015).

**Table 1 – ESG 2005 and ESG 2015**

| <b>ESG Standards 2005</b>  | <b>ESG Standards 2015</b>   |
|--|---|
| 1.1 Quality assurance policies and procedures.                         | 1.1 Quality assurance policy.                                       |
| 1.2 Approval, monitoring and periodic review of programmes and awards. | 1.2 Design and approval of programmes.                              |
| 1.3. Student assessment.   | 1.3. Student-centred learning, teaching and assessment.             |
| 1.3. Student assessment.   | 1.4. Student certification, recognition, progression and admission. |
| 1.4. Ensuring quality teaching staff.                                  | 1.5. Teaching staff.  |
| 1.5. Learning resources and student support.                           | 1.6. Learning resources and student support.                        |
| 1.6. Information systems.  | 1.7 Information management.   |
| 1.7. Public information.   | 1.8. Public information.  |
| 1.2 Approval, monitoring and periodic review of programmes and awards. | 1.9. On going monitoring and periodic review of programmes.         |
|  | 1.10. Cyclical external quality assurance.                          |

Source: Adapted from EQUIP (2016).

According to a study prepared and funded by several European higher education associations (under the umbrella of the EQUIP project), the new standards and guidelines include: student-centred learning; flexible learning methods; recognising competencies acquired outside formal education; increasing internationalisation in higher education; and transparency and trust in higher education (including the new diploma supplement) (EQUIP, 2016, p. 1).

Despite the fact that the ESG document is simply titled Standards, the European Commission website (in the section on the European Credit Transfer and Accumulation System and quality assurance in Education and Training) states that:

The European Standards and Guidelines (ESG) are a set of standards and guidelines for internal and external quality assurance in higher education. **The ESG are not standards for quality, nor do they prescribe how the quality assurance processes are implemented**, but they provide guidance, covering the areas which are vital for successful quality provision and learning environments in higher education. (European Commission, 2021, 3rd paragraph)

### 2.1.2. Quality in Portuguese higher education

Article 76 of the Constitution of the Portuguese Republic (Constitutional Law No. 1/2005, of 12 August) sets out the framework for the assessment of teaching quality in Portuguese universities. However, the importance of implementing an SIGQ in HEI is only explicitly mentioned in the law on the assessment of higher education (Law No. 38/2007), the law regulating HEI (Law No. 62/2007, 10 September) and the decree law that created the A3ES (Decree-Law No. 369/2007, 5 November).

Article 17 of Law No. 38/2007 sets out internal quality assurance requirements for HEI. Article 18 refers to self-assessment procedures for HEI and article 19 sets out the principles of external assessment. Article 147 of Law No. 62/2007 states that HEI are obliged to have a self-assessment mechanism to review their performance; article 159 highlights that HEI must publish an annual report on their activities with information on their self-assessment and external assessment procedures (including the results of the assessments) and; article 161, which addresses transparency, mentions the obligation to publish the self-assessment and external assessment reports on the institution's website. The foreword to Decree Law No. 369/2007 states that "HEI must implement their own quality assurance systems, which are likely to be certified."

Despite the legislative framework already in place, the certification of the SIGQ used by HEI was only regulated in 2013. In January 2013, A3ES published a manual titled Auditing Internal Quality Assurance Systems In Higher Education Institutions – Manual for the Audit Process (A3ES, 2013a), as well as a set of guidelines. The regulation approving the new system for the assessment and accreditation of HEI and their study programmes was published in October (Regulation No. 392/2013 of 1 October).

The regulations were based on an experiment that began in 2011, in which five HEI were invited by the A3ES to test the audit model used to certify SIGQ (A3ES, 2013b). The audits were held during 2012 and the first certifications were awarded in early 2013 (A3ES, 2021b).

Initially, the process for certifying SIGQ in Portuguese HEI was based on the comparative analysis drafted by Santos (2011) and on the ESG 2005, which were converted into the ten references listed in Table 2 (A3ES, 2013a, pp. 13-16).

The 2015 European ESG standards were introduced into Portuguese law in 2016 (A3ES, 2016a), in the format shown in Table 2 (which also shows the differences between the 2013 and 2015 national reference frameworks).

Since the process to certify the SIGQ of HEI was implemented, A3ES has carried out 40 audits that awarded certifications to SIGQ, six of which were recertification audits that began in 2020 (A3ES, 2021b).

The SIGQ of a MHE institution, the Institute of Higher Military Studies (IESM), was certified in early 2016 (A3ES, 2016b). The certification was granted for six years, with no conditions attached, and so far it is the only certified MHE institution (A3ES, 2021b). Magalhães (2020) conducted a study on the IUM's SIGQ, which was based on a different model than the one recommended in this study.

**Table 2 – Comparison of reference points defined by A3ES for the SIGQ certification process in 2013 and 2016**

| Frame of reference for SIGQ published by A3ES in 2013 (based on the ESG 2005) | Frame of reference for SIGQ published by A3ES in 2016 (based on the ESG 2015)   |
|---|---|
| 1 – Definition of a quality policy and objectives.                            | 1 – Policy for quality assurance and pursuit of quality objectives.<br>– <b>More comprehensive than the previous version.</b>   |
| 2 – Definition and quality assurance of educational offer.                    | 2 – Design and approval of programmes.<br>– <b>More comprehensive than the previous version.</b><br>– <b>The monitoring and periodic review component was moved to Reference 5.</b> |
| 3 – Quality assurance of learning and student support.                        | 3 – Student-centred teaching, learning and assessment.<br>– <b>More comprehensive than the previous version.</b><br>– <b>Includes part of Reference 3.</b>                          |
| 3 – Quality assurance of learning and student support.                        | 4 – Student admission, progression, recognition and certification.<br>– <b>New benchmark.</b><br>– <b>Includes part of Reference 3.</b>   |
| 2 – Definition and quality assurance of the educational offer.                | 5 – On going monitoring and periodic review of programmes.<br>– <b>New benchmark.</b><br>– <b>Includes part of Reference 2.</b>   |
| 4 – Research and development.   | 6 – Research and development / Targeted research and high level of professional development.<br>– <b>Similar to the previous version.</b>   |
| 5 – External relations.   | 7 – Collaboration with other institutions and with the community.<br>– <b>Similar to the previous version.</b>  |
| 10 – Internationalisation.  | 8 – Internationalisation.<br>– <b>Similar to the previous version.</b>  |
| 6 – Human resources.  | 9 – Human resources.<br>– <b>More comprehensive than the previous version.</b>  |
| 7 – Material resources and services.  | 10 – Material resources and services.<br>– <b>More comprehensive than the previous version.</b>   |
| 8 – Information systems.  | 11 – Information management.<br>– <b>Similar to the previous version.</b>   |

[Cont.]

|                         |  |
|-------------------------|--|
| 9 – Public information. | 12 – Public information.<br>– <b>More comprehensive than the previous version.</b> |
|                         | 13 – Cyclical external quality assurance.<br>– <b>New reference.</b>               |

## 2.2 Methodology

The study used the research design proposed by Saunders et al. (2009, p.108, cited in Santos & Lima, 2019, p.32). Inductive reasoning was used throughout the study, which begins with the observation of specific facts (the SIGQ used by higher education institutions) to define an approach (a SIGQ for the IUM) by comparing and making associations between the observed data. The research strategy was a qualitative approach that included a literature review and semi-structured interviews. The research design used a case study model because the analysis focused on a single unit. Finally, the study uses a cross-sectional time horizon, in which data are collected at a specific point in time to establish associations between each case and use them to formulate a theory (Santos & Lima, 2019, pp. 25-37).

## 2.3 Method

The literature review was carried out during the exploratory phase. This technique was used to analyse the legislation and regulations in force and documents related to the study topic published by various actors and entities.

The data was analysed to identify dimensions and variables (DF of the SIGQ) and to create a set of questions that served to identify the elements of a SIGQ for higher education institutions, as well as any challenges to its implementation.

To complement the information available in the literature and clarify the questions that were raised during the literature review, semi-structured interviews were conducted with quality managers responsible for the SIGQ used by the IUM (and its schools), by European institutes similar to the IUM and by Portuguese universities. The interviews consisted of open ended questions that helped identify the DF of the SIGQ and the challenges to their implementation. The content analysis was performed according to the method recommended by Sarmiento (2013, pp. 53-66).

The data were analysed using the process described by Rosa, Sarrico and Amaral (2012, p. 143). According to the authors, “Benchmarking not only allows for the comparison of indicators [...] but also allows for the sharing of best practices [...] identifying more intelligent ways of performing the same task and new solutions for common problems”.

In the discussion phase, the collected data were aggregated, and an approach to design a SIGQ for the IUM and its schools was defined.

### 3. The SIGQ of HEI- an overview of the literature

This chapter analyses the SIGQ of HEI from a new perspective based on published documents (scientific articles, regulations and SIGQ assessment reports produced by A3ES).

#### 3.1 Dimensions and variables of a SIGQ

To define the dimensions of the study, the objectives of the audits of SIGQ, the basic principles of quality management and previous studies that review the literature on quality in higher education were analysed.

The audit manual published by A3ES describes the objectives of the audits of SIGQ, which include reviewing the quality policy, the processes and procedures used by the institution in its activities and the system's continuous improvement (A3ES, 2020a, pp. 3-4).

With regards to the basic principles of quality management, the International Organization for Standardisation (ISO) published a document introducing a set of Quality Management Principles (ISO, 2015).

The study was organized into levels of analysis, according to the model provided by Manatos, Sarrico and Rosa (2015) in a review of the literature on the integration of quality management in HEI. The levels of analysis in this model (Processes, Organization and Principles of Quality Management):

“[...] are the most significant in terms of understanding the different approaches to QM [Quality Management] in HE [Higher Education], as well as for drawing conclusions about the degree of integration of QM within the overall governance and management systems of HEIs [Higher Education Institutions].” (Manatos et al., 2015, p. 3)

The Smart-Qual project includes several European higher education institutions / agencies and is co funded by the European Union's Erasmus+ programme. The project published a report on the state of the art of the quality management systems of HEI S (Smart-Qual, 2021), which clusters SIGQ indicators in the ESG+A3ES format. According to the document, the rationale for combining the ESG+A3ES standards is the fact that the A3ES standards are more comprehensive than the ESG because they include research, relations with society and internationalisation.

The structure used to analyse the quality indicators of the Smart-Qual project's SIGQ consists of 14 domains (see Figure 2) and provides a clearer and more comprehensive picture of the areas covered by the SIGQ than the study by Manatos et al. (2015).

| Standard   |
|--|
| 1.1 Policy for quality assurance and pursuit of quality objectives                       |
| 2.1 Design and approval of programmes  |
| 2.2 Student-centred learning, teaching and assessment                                    |
| 2.3 Student admission, progression, recognition, and certification                       |
| 2.4 Ongoing monitoring and periodic review of programmes                                 |
| 2.5 Research and development / targeted research and high-level professional development |
| 2.6 External relations   |
| 2.7 Internationalisation   |
| 3.1 Human resources  |
| 3.2 Material resources and services  |
| 4.1 Information management   |
| 4.2 Public information   |
| 5.1 Cyclical external quality assurance  |
| 5.2 Cyclical internal monitoring, evaluation and continuous improvement of the QMS.      |

**Figure 2 – Indicators of the SIGQs of HEIs grouped by domains**

Source: Available from Smart-Qual (2021, p. 8).

The process used by A3ES to audit the SIGQ of HEI was organized according to specific areas of analysis:

1. The institutional policy for quality assurance [...].
2. The scope and effectiveness of the quality assurance procedures and structures related to each of the core aspects of the institutional mission:
  - 2.1 Teaching and learning;
  - 2.2 Research and development [...];
  - 2.3 Collaboration with other institutions and with the community;
  - 2.4 Policies for staff management;
  - 2.5 Support services;
  - 2.6 Internationalisation.
3. The relationship between the quality assurance system and the strategic management [...] of the institution.
4. The participation of internal and external stakeholders in the quality assurance processes.
5. The information management [...].
6. The publication of information relevant to external stakeholders.

7. The monitoring, evaluation and continuous improvement of the internal quality assurance system. (A3ES, 2020a, pp. 4-5).

A study by Cardoso, Rosa, Videira and Amaral (2017, p. 332) on the structure of the SIGQ implemented by HEI found that institutions avoid deviating from the model defined by A3ES because they wish to have their systems certified with simpler audits, which results in any differences related to specific features being eliminated.

The areas of analysis of the A3ES SIGQ certification process were defined as the **research dimensions**, based on a rationale that combines the aspects presented above. However, the quality management principles listed earlier will be used to guide the analysis. The DF and the challenges to the implementation of the SIGQ identified in the analysis of these systems will be used as **research variables**.

### 3.2 DF of the SIGQ of HEI and challenges to implementation found in the reviewed literature

The analysis performed to identify the study variables was based on two types of published documents about the SIGQ of HEI: scientific studies and audit reports produced by A3ES after assessing the SIGQ of universities and university institutes.

Due to the significant differences between the A3ES regulations and the ESG 2015, which can be seen in the Table above, the analysis focused on Portuguese studies, rather than on studies based on the ESG 2015.

Serralheiro and Morais (2019, p. 4) stress that implementing the SIGQ will require the allocation of resources and that this will entail financial costs. The study also mentions the need to carry out internal audits to ensure the system's continuous assessment and improvement using the Plan-Do-Check-Act (PDCA) cycle.

Cardoso, Rosa, Videira and Amaral (2019, p. 258) list some effects of implementing quality assurance practices: greater demand and time availability for non-academic tasks; greater formalisation of procedures; increased monitoring of academic performance; improving the quality of public information about the institution's activities; and recognition by teaching and non-teaching staff of the additional bureaucratic burden.

When discussing how to implement a SIGQ, Cardoso et al. (2017) mention that: the A3ES certification model has led HEI to base their SIGQ model on the A3ES model; the creation of a document base could cause the system to become over bureaucratic; the SIGQ structures are usually organized into a strategic level (with committees or councils) and a functional level (with offices and services); information systems play an important role in SIGQ; and, the information dissemination on HEI is a weakness in the SIGQ of Portuguese HEI.

Santos and Dias (2017, p. 285) state that the quality policy of the SIGQ used by University of Minho (UM) is implemented through the strategic programme, the quality plan, and the procedures for monitoring, assessment and feedback for quality enhancement (using the PDCA cycle). The participation of stakeholders during the design and implementation of the UM's SIGQ was a factor in the system's success. The implementation of the information system also highlighted problems of articulation between different sectors of the institution.

With regards to the SIGQ audit reports prepared by the A3ES' EAT, nine certified public universities and university institutes were identified (A3ES, 2021b), as shown in Table 3.

**Table 3 – Public HEI with a certified SIGQ**

| Name of HEI                                 | Date of SIGQ Certification |
|---|----------------------------|
| ISCTE – University Institute of Lisbon      | 11-02-2015                 |
| Open University                             | 19-05-2020                 |
| University of Algarve                       | 12-04-2018                 |
| University of Aveiro                        | 14-12-2017                 |
| University of Coimbra                       | 06-04-2015                 |
| University of Évora                         | 21-08-2020 <sup>2</sup>    |
| University of Minho                         | 01-07-2020 <sup>2</sup>    |
| University of Porto                         | 14-12-2017                 |
| University of Trás-os-Montes and Alto Douro | 19-05-2020                 |

Source: Available from A3ES (2021b).

Since only a small number of certified institutions was found, the analysis included all assessment reports drafted by the A3ES' EAT during the most recent certifications.

The identified DF were based on aspects highlighted in the reports, with regards to their existence (and especially regarding their strengths or the areas to be improved) or lack thereof, as shown in Table 1.

**Table 1 – DF of SIGQ**

| Examples of defining features of a SIGQ   |
|---|
| In teaching and learning, <b>the SIGAQ [Internal System for Quality Assurance and Assessment] is supported by the Information System</b> , which provides multiple tools for producing information and analysing the annual results. <b>The most relevant of these tools are the pedagogical student surveys and teacher surveys, the self-assessment reports of CU [Curricular Units] and courses, especially the “periodic summary / reflective reports”.</b> (A3ES, 2020b, p. 3) |
| Despite the University's commitment and efforts to ensure the quality of the pedagogical training of teaching staff, the EAT <b>could not obtain formal information about any prescriptive and specific training being provided as a result of teaching performance assessments</b> and / or recommendations stemming from the <b>analysis of anomalies in the functioning of curricular units.</b> (A3ES, 2017b, p. 7)   |
| <b>There is no mention of internal quality audits</b> having been conducted on bodies or services, or of any sectoral processes. Likewise, the report does not mention any audits on research or extension processes (A3ES, 2015b, p. 16). (A3ES, 2015b, p. 16)   |

Source: Available from A3ES (2021b).

<sup>2</sup> Recertification.

The analysis focused on the existence of mechanisms for detecting quality anomalies in all research dimensions, and on identifying indicators with targets to be achieved (meta assessment). The latter were also identified by Nicolau (2016, p. 16), in a study that reviewed certified SIGQ quality manuals to propose a set of indicators for the SIGQ of the Faculty of Science and Technology of the NOVA University of Lisbon.

The wording of the reviewed documents may differ from the wording of the DF. This is due to the fact that the text of the reports depends on the EAT that drafts them. However, the contents of the report refer to the identified DF.

The DF identified in the documents are grouped into research dimensions. The most frequently mentioned DF are listed below:

- Institutional quality policy: a functional body that manages the SIGQ; a strategic plan; an advisory body for quality / the SIGQ.
- Teaching and learning: a study cycle report; support / monitoring mechanisms for the teaching and learning process; a student survey.
- Research and development: an organizational structure for research; regular assessment of research units; a specific advisory body for research.
- Collaboration with other institutions and with the community: mechanisms and instruments for liaising with other institutions and with the community; an organizational structure for collaborating with other institutions and with the community; the institution participates in external development and innovation organizations.
- Personnel management policies: mechanisms and instruments to assess teaching staff and researchers; mechanisms and instruments to support teaching staff and improve teaching quality; systematic mechanisms to train human resources.
- Support services: mechanisms and instruments to assess the support services; ISO 9001 certification; integration of support services into the SIGQ.
- Internationalisation: internationalisation mechanisms; organizational structure for internationalisation; mechanisms and instruments to assess internationalisation.
- Articulation between the quality assurance system and the institution's governance and management bodies: the management bodies are represented in the SIGQ; linkages between the management bodies and the SIGQ.
- Stakeholder participation: mechanisms that allow for the participation and collaboration of internal and external stakeholders in all aspects of the SIGQ; identification of stakeholders; organizational structure to liaise with stakeholders.
- Information system: a comprehensive and highly integrated information system within the SIGQ; an information system that systematises and provides up-to-date information to the decision making levels; automated / systematic production of reports.
- Publication of relevant information for external stakeholders: up-to-date information available on the institutional websites, as defined in the legislation / regulations; information about the SIGQ available on the institution's website; an organizational structure responsible for publishing the information.

- Monitoring, assessment and continuous improvement of the quality assurance system: a regular SIGQ report to enable monitoring, assessment and continuous improvement; a meta-assessment; a mechanism for suggestions and complaints.

The most relevant challenges identified in the analysis were:

- The lack of an integrated information system with all the information related to the SIGQ.
- Staff turnover due to the specific nature of military education.

#### **4. The SIGQ of HEI – the institution’s perspective**

This chapter analyses the SIGQ implemented at the IUM and its schools, at European institutions similar to the IUM and at national HEI with a structure similar to the IUM’s. The research is organized by type of institution. However, due to their similarities, the findings of the analyses carried out at the IUM (and its schools) and at European institutions similar to the IUM are presented together.

The analysis of the SIGQ was based on a review of the quality manuals of each institution, when available, and on the information collected during the interviews with the institutions’ quality managers.

The analysis included the DF and challenges listed in the previous chapter, grouped into categories that correspond to research dimensions. A set of questions was created for the interview script based on these dimensions. The questions were adapted to each set of institutions (the IUM and its schools, the IUM’s European counterparts and Portuguese HEI), bearing in mind their specificities. Regarding these specificities, the analysis included the applicable legislation and regulations, the organization, the structure, the students, the human resources, the information system and the current quality system.

The semi-structured interviews were organized as recommended by Freixo (2012, pp. 220-223) and Santos and Lima (2019, pp. 83-85), and the content analysis was performed according to the procedures described by Sarmento (2013, pp. 53-66), in which categories correspond to research dimensions and the recording units are the DF of the SIGQ and the challenges to their implementation. During the interviews, the interviewees could elaborate freely on their answers, even though the focus was on the defined dimensions.

##### **4.1 The SIGQ used by the IUM and its European counterparts**

###### **4.1.1. The SIGQ used by the IUM and its schools**

The IUM has six schools: three autonomous schools that confer university level degrees (Naval School [EN], Military Academy[AM] and Air Force Academy [AFA]), one autonomous polytechnic school (Military Polytechnic Unit [UPM]), one non-autonomous school that confers postgraduate degrees (Department of Postgraduate Studies [DEPG]), and a research and development centre (IUM Research and Development Centre [CIDIU]) (Decree-Law No. 249/2015). The structure and history of the autonomous schools dates back several years (Borges, 2005), whereas the CIDIU and the UPM are more recent (they were created in 2015 and 2019, respectively).

MHE establishments were included in the legislation that governs Portuguese higher education in 2006 (Decree-Law No. 37/2008 of 5 March). Since then, these institutions have obtained accreditation for 47 study programmes (A3ES, 2021a). MHE establishments have quality assurance mechanisms accepted by A3ES because they are aware that some aspects analysed for the accreditation of study programmes by A3ES are requirements related to the SIGQ of HEI (A3ES, 2018b). However, these mechanisms are not certified as SIGQ (A3ES, 2021b).

The SIGQ of the IUM schools were analysed individually. However, the CIDIUM and the UPM do not have their own SIGQ, as set out in the relevant legislation (Decree-Law No. 249/2015; Decree-Law No. 17/2019 of 22 January). As such, the IUM's current SIGQ also includes the information related to these schools. Despite this, the quality managers of the schools were contacted and asked to provide information that complemented the interviews with the IUM's SIGQ manager.

In general terms, the SIGQ of the IUM's schools comply with the certification requirements set by A3ES (IUM, 2017; EN, 2015; AM, 2022; AFA, 2015). This can be confirmed by comparing the DF and challenges identified in the literature with the categories identified during the analysis of the quality manuals and the interviews with the quality managers of the IUM schools (J. Martins, face-to-face interview, 16 February 2022; L. Bernardino, face-to-face interview, 17 February 2022; J. Patronilho, face-to-face interview, 23 February 2022; L. Pereira, face-to-face interview, 23 February 2022; V. Almeida, email interview, 14 April 2022; J. Marreiros, email interview, 18 April 2022).

The IUM's SIGQ have specificities that stem from: the fact that the current legislative structure is incomplete (the internal regulations of the schools have been pending approval since 2015); their status as military institutions; their hierarchical organization, and; their end customer. The latter is especially important because the primary customers of the IUM and its schools are the General Staff of the Armed Forces (EMGFA) / the Branches / the National Republican Guard (GNR) and the students. These specificities include the following DF and challenges:

- There is a double interdependence, hierarchical and functional.
- The institutional strategy is based on the strategy defined by the hierarchical structure (EMGFA / Branch / GNR).
- There are different quality policies for each school.
- The organization is mainly based on procedures (NEP).
- The Scientific Council or the Command's sector managers hold meetings to discuss quality assurance/continuous improvement.
- The institution collaborates with the Armed Forces' operational units to ensure that the education provided is effective.
- The schools' internal regulations are not integrated into the new IUM structure.
- The SIGQ does not have an integrated information system.
- The CIDIUM and the UPM are not integrated into the IUM's SIGQ.

- The procedures for the accreditation for study programmes are not the same in all schools.
- Military personnel, and especially quality managers, remain in their positions at the schools for a relatively short time.

#### **4.1.2. The SIGQ of European institutions similar to the IUM**

The database of the European Quality Assurance Register for Higher Education (EQAR) (2022), the Military School Directory (2022), the institutional websites of the HEIs and the national accreditation agencies were consulted to obtain information on the accreditation status of the institutions / programmes and the certification status of their SIGQ.

The Finnish National Defence University (FINDU) and the Norwegian Defence University College (NDUC) are the only European institutions similar to the IUM that fit the scope of this study. They have certified SIGQ or institutional accreditation (which includes the quality assurance system) from the Finnish higher education accreditation agencies, and a structure similar to the IUM structure (with several schools) (FINDU, 2022; NDUC, 2022).

In Finland, SIGQ are assessed by the Finnish Education Evaluation Centre (FINEEC). The third cycle of assessments began in 2018 and will continue until 2024 (FINEEC, 2022). The FINDU was assessed in 2017 and will be assessed again in the spring of 2023. The information on FINDU was obtained from the 2017 assessment report (FINEEC, 2017), which was analysed to identify the institution's DF, and from an interview with the institution's quality manager. The report highlights the best practices adopted by the institution, which pays special attention to the high turnover of military personnel, and makes efforts to ensure that the organization is operational at all times. During the interview (H. Tarja, videoconference interview, 12 May 2022), the following DF were identified: the quality assurance system includes all schools; the Vice-Rector is responsible for coordinating the quality assurance system; there are committees with representatives from the branches, which discuss matters related to the programmes; and all stakeholders participate in the continuous improvement of the quality assurance system.

In Norway, SIGQ are assessed every six to eight years by the Norwegian Agency for Quality Assurance in Education (NOKUT), according to the ESG 2015 (NOKUT, 2022a). The applicable legislation was approved in 2017 and the assessment of the NDUC will take place by the summer of this year. The requirements set out in NOKUT's quality assurance assessment manual (2021) are similar to the requirements defined by A3ES in the manual for auditing SIGQ (Schmidt, 2017; A3ES, 2020a).

According to K. Tokstad (videoconference interview, 12 April 2022), the NDUC's quality structure was only created in 2018 and is still in the implementation phase. As such, the NDUC is not yet integrated into the NOKUT system. However, the NDUC schools were assessed individually between 2011 and 2014 (NOKUT, 2022b). Even though the certification process is still ongoing, the SIGQ of this institution was analysed to identify similarities to the systems used at the IUM and any aspects that may enhance the integration of the IUM's SIGQ. During the interview, two defining features were identified. The first is that the schools

have local coordinators, with their own staff, who are “quite independent” and work as a team, according to K. Tokstad (op. cit.). The local staff coordinates all activities that take place in its school, and meetings are held with all coordinators when needed. The second feature concerns the stakeholders, and specifically the branches. There are local advisory boards or advisory groups with internal members (e.g. study cycle coordinators) and external members (e.g. representatives from the Defence sector or the branches), who meet to discuss issues related to education effectiveness (K. Tokstad, op. cit.).

## **4.2 The SIGQ of university institutes and universities with an organization similar to that of the IUM**

### **4.2.1. National universities and university institutes with certified SIGQ**

There are 15 public universities / university institutes (DGES, 2021) in Portugal, nine of which have SIGQ certified by A3ES (2021b). There are also 14 private universities / university institutes (DGES, 2021), six of which have SIGQ certified by A3ES (2021b). However, some universities that do not have certified SIGQ have schools with certified SIGQ, e.g. University of Lisbon / Instituto Superior Técnico.

In terms of structure, of the 15 universities / university institutes that have certified SIGQ, only six have autonomous schools: University of Algarve (UALg); University of Évora (UEv); UM; University of Trás-os-Montes and Alto Douro (UTAD); University of Porto; and University of Coimbra. However, only the first four have university and polytechnic schools (DGES, 2021).

### **4.2.2. The certified SIGQ of universities with university level schools and polytechnic schools**

The analysis of the certified SIGQ of the national universities and university institutes focused on UALg, UEv, UM and UTAD, all of which had quality managers who were willing to participate in the study and available to be interviewed. The DF identified in the quality manuals of each institution were compiled before the interviews took place (UALg, 2020; UEv, 2015; UM, 2019; UTAD, 2022).

The interviews revealed that the SIGQ of these institutions integrated polytechnic education and all other areas of the institutions (S. Lameiras, videoconference interview, 22 March 2022; C. Pires, videoconference interview, 24 March 2022; A. Freitas, videoconference interview, 25 March 2022; C. Amaral, videoconference interview, 20 April 2022).

With regards to the implementation of the SIGQ, A. Freitas (op. cit.) stated that “quality should be aligned with strategic planning”, referring to the need for a quality coordinator, who should be a representative of the institution’s governing body, and the need to harmonise the strategic plan, the activity plans and reports, and the quality reports. According to A. Freitas (op. cit.), the Quality Advisory Board, chaired by the Rector, liaised with all internal managers and external stakeholders and was instrumental in the SIGQ’s implementation.

Referring to the SIGQ, C. Amaral (op. cit.) states that “the institution’s main customer is the student body” and A. Freitas (op. cit.) mentions that, by implementing the system, the

institution was able to systematise and simplify the procedures to have study programmes audited by A3ES. With regards to the initial costs of implementing the SIGQ, C. Amaral (op. cit.) stresses that training human resources, especially in information systems, is “absolutely necessary”.

All interviewees agreed that one of the pillars of the SIGQ is the information system, which acts as the system’s liaising element. At UM, it is considered one of the coordination, articulation and support structures, along with the Vice-Rector for Quality, the SIGQ Monitoring Committee and the department responsible for quality assurance (UM, 2019, p. 11). S. Lameiras (op. cit.) states that the central structure liaises with the schools through the SIGQ information system, eliminating the need for local quality managers.

The fact that the SIGQ model is similar to the structure of the areas of analysis defined in the quality audit manual makes it easier to have the system certified by A3ES (C. Pires, op. cit.).

The analysis revealed that there are many similarities between the SIGQ of these institutions, with some specificities that result from how they are implemented. The following DF were identified in the analysis:

- A member of the governing body is responsible for coordinating the SIGQ.
- There is a management body responsible for Quality.
- The schools do not have local quality managers.
- The SIGQ covers all areas and there is no differentiation between university and polytechnic education.
- The SIGQ instruments (surveys and reports) are automated.
- There are mechanisms to detect instances of poor quality, and improvement plans to address them.
- There is an integrated information system.
- There is a single structure responsible for producing the information that will be published.
- A meta-assessment is carried out.

## 5. Discussion of findings

The analysis of the DF identified in the published literature and the DF of HEI shows that these institutions’ SIGQ are supported by four main areas: structure (organization of the institution and physical infrastructure), mechanisms (support systems and processes / procedures), instruments (surveys and reports) and system actors (internal and external stakeholders) (UM, 2019, p. 9). Therefore, in the section discussing the SIGQ, the study dimensions will be grouped into these broad areas.

In this chapter, the IUM’s SIGQ, which will include all schools and support services, will be referred to as IUM Integrated Quality Assurance System (SIGQIUM), to highlight that it plays an integrating role in MHE.

## 5.1 The SIGQIUM

### 5.1.1. Structure

The organizational structure of the IUM defined in Decree-Law No. 249/2015 does not include a quality advisory body. The document only mentions that proposals for measures to improve the quality of education and research should be submitted by the IUM Commandant to the Board of Directors. However, this body is not particularly representative of the SIGQ actors (e.g. the DEPG, the CIDIUM and the student body do not have a seat on this board).

The universities analysed in the study have councils or similar structures that include representatives of all the SIGQ actors (UAlg, 2020, p. 8; UEV, 2015, p. 8; UM, 2019, p. 11; UTAD, 2022, p. 9-10). Given the broad range of issues that this body analyses, some universities have set up subcommittees for each school, which provide vertical linkages, and subcommittees for common areas (e.g. education, research, Pedagogical Council, Scientific Council) that provide horizontal linkages between the bodies of each school (C. Amaral, *op. cit.*). Through these structures, the SIGQ mechanisms and instruments can be harmonised at different levels and areas (C. Amaral, *op. cit.*).

UTAD has a Quality Monitoring Committee chaired by the Rector, which consists of the quality coordinator, the heads of the schools and research units, the president of the academic association, and other bodies or internal and external representatives that have been invited. Given that creating a quality advisory council for the SIGQIUM will not be possible, a Quality Monitoring Committee similar to the UTAD's could be created instead, which may include the EMGFA / Branches / GNR, when needed (as in the case of FINDU and NDUC). The vertical structures would be the schools' subcommittees and the horizontal structures would be subcommittees on topics that are common to all areas (education, research, scientific and pedagogical committees, support services, etc.).

With regards to the operationalisation of the SIGQIUM, the NDCU model includes a coordinating office and local offices at the schools. This would allow the schools to maintain their autonomy and specificities, as well as provide a way to coordinate with them, which all the managers of the quality offices of the IUM schools mentioned was a concern (J. Martins, *op. cit.*; L. Bernardino, *op. cit.*; J. Patronilho, *op. cit.*; L. Pereira, *op. cit.*).

Universities also have common structures for specific areas, including: internationalisation and mobility, communication and image, and relations with stakeholders. This topic should be discussed when the SIGQ is designed to ensure that the requirements are met and, simultaneously, to allow the schools to remain autonomous. At UEV, internationalisation is decentralised in the different areas of the university because each area has specific requirements (C. Pires, *op. cit.*).

Using the format proposed above to design the SIGQIUM would make it possible to take advantage of the organization and structures that already exist in SIGQ, optimise resources (if cross cutting structures are created for specific areas) and harmonise the system's mechanisms and instruments (through the subcommittees).

### 5.1.2. The mechanisms

The SIGQ is based on two pillars: the strategic plan and the quality manual, which links the institutional strategy and the quality policy (UAlg, 2020, p. 1). These two documents cover all the institution's activities. According to UM (2019, p. 10), the development and implementation of the quality policy is based on the Military Higher Education Strategic Directive, the strategic plan, the activity plan, the activity report and the quality manual, among other documents. Meta-assessment is also an essential feature of the quality policy, promoting the continuous improvement of the SIGQ and providing a dashboard to aid decision making based on the information generated by the SIGQ (UM, 2019, p. 33-35).

Currently, the IUM as a whole has four strategic plans and four quality policies. The SIGQIUM should integrate the sectoral strategies of the schools, which are interconnected with the strategic directives of the EMGFA and the Branches / GNR, into a single but comprehensive strategy that reflects their specific interests. The quality policy will depend on this strategy and should also take those interests into account. The schools' activity plans may include some of the activities in the IUM's strategic plan and the strategic directives of the Branches / GNR, in order to accomplish the objectives outlined in both documents.

The organization of the Quality Manual and respective SIGQ should be similar to what is described in the A3ES quality audit manual, as is the case in most institutions.

The Quality Manual identifies the system's stakeholders (both internal and external) and their responsibilities, and explains the mechanisms and instruments that liaise with the SIGQ (UAlg, 2020, p. 1). Most institutions use mechanisms based on regulations and procedures, rather than a model based on processes. The latter is useful at a more advanced stage of the system, when the process to obtain ISO certification can be initiated, as UTAD has done (2022, p. 2).

These mechanisms, which include monitoring, assessment and intervention on the different areas of the system (teaching, research and support services), should focus on instances of poor quality, on monitoring the improvement plans that were produced to address these situations, and on the recognition of the efforts made by all the institutions' employees (teaching staff, researchers, managers and service staff).

In the universities analysed in this study, the mechanism for institutional accreditation and the accreditation of study programmes is supported by the SIGQ structures. The IUM schools have different approaches to this mechanism (e.g. EN), which should be harmonised by applying the most commonly used model, in order to consolidate the network of Quality Offices involved in the accreditation of study programmes, as described in the A3ES strategic plan 2021-2024 (A3ES, 2021c, p. 23).

Given the specific nature of military careers, a mechanism should be created to minimise the negative impacts of the high turnover rates of military personnel at the IUM, as FINDU has done (FINEEC, 2017).

Referring to the documentation and information systems, which are an integral part of these mechanisms, S. Lameiras (op. cit.) states that "our documents are unique, cross cutting, holistic and integrated in all schools". A. Freitas (op. cit.) stresses that "integrating all the

information into a single system is something that must be done” and that the “information must be published in a single platform”. According to the assessment reports from A3ES, the information system plays an important role in the SIGQ of UEv and UM, supporting their development (A3ES, 2020e, p. 10; A3ES, 2020b, p. 11). Furthermore, HEI will benefit from implementing an information system in their SIGQ because these systems have to be improved / changed continuously (A. Freitas, op. cit.; C. Pires, op. cit.; S. Lameiras, op. cit.).

A document base should be created, along with a comprehensive information system and mechanisms for publishing information in a systematic way that cross cuts all IUM schools and organizations. The on-the-shelf platform acquisition (Military Higher Education Management Integrated System) was the beginning of the process of integrating information management. However, it may be necessary to hire a service to maintain and update the SIGQIUM, to ensure that it does not become a challenge.

### 5.1.3. The instruments

The information systems of the Portuguese HEI automatically generate surveys and reports, and there are fields for area managers to fill out manually with their self-assessments, and allow them to add suggestions for improvement, when applicable. If the managers do not add any information, the reports are closed when the deadlines are reached, and are analysed by the existing structures (A. Freitas, op. cit.). This prevents the SIGQ from becoming over bureaucratic (a challenge that was identified in the analysed documents), provides instruments to assess the system, and allows for strategic decision making, which is essential to develop the SIGQ (A3ES, 2020b, p. 3). Several instruments used in the SIGQ certified by A3ES were identified, including: surveys addressed to all actors, on all areas of the institution; and reports on the curricular units, study programmes, schools and support services; and the meta assessment. The meta-assessment is carried out annually, usually through a SIGQ assessment report. It “integrates not only a synthetic analysis of information contained in the other reports, but also an assessment of the state of development of the SIGQUALg with reference to the Evaluation and Accreditation Agency for Higher Education”, and includes suggestions and recommendations for improvement from the various bodies (UAlg, 2020, p. 37).

According to the quality managers, the instruments used in the SIGQ of the IUM schools have some shortcomings, such as the lack of automation (L. Bernardino, op. cit.; J. Patronilho, op. cit.; L. Pereira, op. cit.), which makes it difficult to assess the areas covered by the SIGQ. To simplify and continuously improve the system, the SIGQIUM instruments should be integrated into the information system that will be acquired.

Audits are rarely used by the universities included in this analysis. At UM, this instrument is used to conduct a pedagogical audit when instances of poor quality are detected in curricular units (S. Lameiras, op. cit.). UTAD only uses auditing for the purposes of ISO certification (C. Amaral, op. cit.).

Given that the analysed universities have different opinions about the effectiveness of audits, they should only be used at a more advanced stage of the SIGQIUM’s implementation.

#### 5.1.4. The actors

Leadership is one of the principles of quality (ISO, 2015, p. 6). The universities have appointed the rector, or one of the vice-rectors, as the SIGQ coordinator. According to the provisions of article 10 of the IUM Statute (Decree-Law No. 249/2015), the Commandant is responsible for coordinating the SIGQIUM.

In higher education institutions, the customer is the student body, but at the IUM, the main customers are the EMGFA, the branches and the GNR. While the focus of the SIGQ is the student body (ENQA et al., 2015, p. 12), interaction with customers is one of the basic principles of quality (ISO, 2015, p. 4). Therefore, the institution's customers should be involved in the design of the SIGQIUM.

The SIGQ will only be complete if all the actors in the system are involved, including students, teachers, researchers, managers and support service staff, in line with the third principle of quality (ISO, 2015, p. 8). However, the actors should be allowed to adapt to the SIGQ information system, and training is essential for the system to be accepted and effective (A. Freitas, op. cit.; C. Amaral, op. cit.).

#### 5.2 Guidelines to design a SIGQ for the IUM and its schools

The SIGQIUM should include the DF and challenges identified in the study. The system should also account for the specificities of MHE, such as the autonomy of the schools and their close links to the Branches, their main customer.

Based on the analysis carried out in the study, developing and integrating a SIGQIUM that complies with the quality standards for higher education should be based on the following guidelines:

- Appointing the IUM Commandant as the person responsible for coordinating the implementation and management of the SIGQIUM, as UTAD has done (Regulation No. 959/2021 of 8 November).
- Creating a SIGQIUM Monitoring Committee (SIGQIUM-MC) chaired by the IUM Commandant, similar to UTAD's SIGQ Monitoring Committee (2022, p. 9-10).
- Creating a quality assurance subcommittee in each school, similar to the committees of the UTAD schools (C. Amaral, op. cit.).
- Creating subcommittees of the SIGQIUM-MC for each area of intervention (e.g. teaching, research, Scientific Committees, Pedagogical Committees), similar to the subcommittees created by UM (S. Lameiras, op. cit.) and UTAD (C. Amaral, op. cit.).
- Including all IUM stakeholders, both internal (e.g. Commanders / Heads of the schools, students) and external (e.g. EMGFA, Branches and GNR), in the SIGQIUM-MC or its subcommittees, as NDUC has done with its advisory groups (K. Tokstad, op. cit.).
- Creating a decentralised structure for the Assessment and Quality Office, with the main hub at the IUM (in Pedrouços) and delegations in the autonomous schools, similar to the NDUC structure (K. Tokstad, op. cit.).

- Integrating all IUM areas of intervention (schools and support services) and their respective actors into the SIGQ, as set out by A3ES (2020a, p. 20).
- Creating other cross cutting structures, which all schools can use when needed (e.g.: internationalisation; communication, information and image), similar to the structures created at UAlg (2020).
- Producing a strategic plan for the IUM and its schools.
- Defining a quality policy aligned with the IUM's strategic plan, comprehensive enough to accommodate the interests of the EMGFA, the Branches and the GNR, when possible.
- Creating a single Quality Manual for the SIGQIUM, which should include guidelines for the creation of mechanisms and instruments that are common to all IUM schools.
- Creating activity plans for all IUM schools and support services, which should be aligned with the IUM strategic plan and accommodate the interests of the EMGFA / Branches / GNR, when possible.
- Conducting a meta-assessment of the SIGQIUM.
- Creating cross cutting monitoring, assessment and continuous improvement mechanisms for all the IUM's areas of intervention, supported by procedures and flags (e.g. procedures for detecting instances of poor quality, improvement plans and the SIGQIUM monitoring dashboard). The UEv model is worth analysing. In this model, the teaching mechanisms are based on a single regulation that integrates almost all the procedures for that area (C. Pires, *op. cit.*).
- Implementing an information system that integrates all the information in the SIGQIUM.
- Implementing the instruments used by all Portuguese HEI at the IUM and its schools (e.g. surveys addressed to students, teaching staff, researchers and non teaching staff; quality reports on all areas of intervention), which should be systematised and automated in the SIGQIUM information system.

When the SIGQIUM is implemented, the following challenges should be addressed:

- The high turnover rates of human resources due to the specific nature of MHE.
- The information system does not meet the needs of the SIGQ.
- The lack of training provided to human resources on how to operate the SIGQ, and especially on the information system.
- The IUM schools have different procedures for accrediting study programmes.

## 6. Conclusions

The IUM and its schools have shown that they have the quality assurance mechanisms required to accredit their study programmes through A3ES. However, only the IESM, the IUM's predecessor, obtained a certification for its SIGQ (in 2015). Currently, the IUM (individually), the EN, the AM and the AFA have dedicated SIGQ that operate independently. During the IUM's institutional accreditation by A3ES in 2019, the EAT recommended the implementation of a SIGQ that included all schools.

The A3ES strategic plan for 2021-2024 states that the certification of the SIGQ of HEI should be included in the institutional assessment. The IUM's institutional accreditation is set to be renewed in 2024. As a result, the IUM and its schools may have to consolidate their SIGQ in the short term.

Given the need to design a SIGQ for the IUM that includes the schools, the purpose of this study was: to propose guidelines to design a SIGQ for the IUM and its schools, in order to comply with the standards for quality assurance in higher education. The object of study was the SIGQ, and the study was delimited to: the period since the first SIGQ certifications were granted by A3ES (since 2013); the IUM and its schools, their European counterparts and Portuguese HEI with certified SIGQ and a structure similar to the IUM's (with autonomous schools that offer both polytechnic and university level degrees); the use of Portuguese and European standards to certify the SIGQ of HEI.

With regard to the methodological procedure, the study used inductive reasoning, supported by a qualitative research strategy and a case study research design. The instruments were a review of the literature (on the certification of the SIGQ of HEI) and semi-structured interviews (with quality managers from HEI who fit the scope of the study).

To ascertain the state of the art on the study topic, a literature review was carried out, which revealed that the current Portuguese standards for the certification of SIGQ are more comprehensive than the European standards. Therefore, the data that supported the study were obtained from published documents on Portuguese SIGQ. The study focuses on the A3ES requirements for the certification of SIGQ. However, the ISO quality principles were also included in the analysis.

The first part of the study analysed the documentation on the certification of SIGQ from a new perspective. Research dimensions were defined and associated with the specific areas of analysis of the A3ES audit process, and elements characterising these dimensions were identified. Challenges to the implementation of SIGQ were also identified for each dimension. Due to the differences between European (ESG) and Portuguese (A3ES) regulations, the analysis focused on documents related to the SIGQ of Portuguese HEI.

The second part of the study analysed the SIGQ used at the IUM and its schools, as well as the SIGQ used by European institutions similar to the IUM. In the case of European MHE institutions, the analysis revealed that only the Finnish and Norwegian counterparts fit the scope of the study, even though the NDUC certification process was still underway. At NDCU, the SIGQ structures are decentralised in the schools. Both FINDU and NDCU have a single quality assurance system, a Vice-Rector responsible for coordinating quality, and committees that include Defence representatives and representatives from the Branches of the Armed Forces. The SIGQ that are currently used at the IUM and its schools are fully independent and are not certified by A3ES. Furthermore, some defining features are specific to the Armed Forces, e.g. the branches are the main customers of military higher education institutions. By analysing the quality manuals and the information obtained in the interviews, it was possible to identify similarities in the SIGQ of these institutions, which are reflected in the DF and in the challenges to implementation.

The SIGQ of UAlg, UEv, UM and UTAD, which have autonomous schools that confer university and polytechnic degrees, were analysed during the third phase of the study. Generally, the fact that universities offer polytechnic education does not influence the SIGQ models of these HEI. Analysing the quality manuals of these institutions and the interviews with the quality managers also made it possible to identify DF, which include: the SIGQ models are aligned with the areas of analysis of the A3ES audit process, which facilitates the certification process; the Rector or one of the Vice-Rectors / Pro-Rectors of the institution is responsible for coordinating the SIGQ; the SIGQ is supported by an integrated information system; there is a single structure responsible for publishing information; and a meta-assessment of the SIGQ is carried out.

By analysing the SIGQ of the HEI described above, it was possible to identify DF in the SIGQ of the IUM and its schools, as well as specificities related to the current status of MHE, including: an incomplete legislative framework, the autonomy defined in Decree-Law No. 249/2015, the military status of the institutions, their hierarchical interconnection and their end customer. The study's GO was accomplished by compiling a set of guidelines to design the SIGQIUM (which includes all the IUM schools), in compliance with the standards defined for quality in national higher education: appointing the IUM Commandant as the person responsible for coordinating the implementation and management of the SIGQIUM; creating a SIGQIUM Monitoring Committee chaired by the IUM Commandant; creating quality subcommittees for each school and area of intervention (e. g. teaching, research, Scientific Committees, Pedagogical Committees); including IUM stakeholders, both internal (e.g. Commanders / Heads of the IUM and the schools, students) and external (e.g. EMGFA, Branches and GNR) in the Monitoring Committee or its subcommittees; creating a decentralised structure for the Assessment and Quality Office, with the main hub at the IUM (in Pedrouços) and delegations in the autonomous schools; creating a strategic plan for the IUM that includes the autonomous schools and a quality policy comprehensive enough to accommodate the interests of the EMGFA, the Branches and the GNR; carrying out a meta assessment of the SIGQIUM; creating monitoring, assessment and continuous improvement mechanisms in all the IUM, for all areas of intervention, supported by procedures and flags (e. g. procedures for detecting instances of poor quality, the respective improvement plans, and a dashboard to monitor the SIGQIUM); implementing an information system that integrates all information provided by the SIGQIUM; implementing the SIGQIUM instruments (e.g. surveys addressed to students, teaching staff, researchers and non teaching staff; quality reports on all areas of intervention), which should be systematised and automated through the information system of the SIGQIUM.

Several challenges to the implementation of the SIGQ were identified and should be addressed (e.g. by creating mechanisms to reduce the effects of the high turnover rates of the IUM's human resources and by training the actors on how to use the SIGQ information system to ensure that it is both accepted and effective).

Furthermore, the study served to advance the knowledge in this field of study by identifying the DF of the SIGQ of HEI, which should be taken into account when designing

and operating these systems, and which correspond to the areas of analysis of the A3ES audit process, as well as the challenges to the implementation of these systems.

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