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Management accounting and the applicability of the ABC method in military higher education at the Military Academy: a model for decision making support and performance

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Abstract

This article analyzes the importance of management accounting and the applicability of the activity-based costing (ABC) method in Portuguese military higher education, specifically regarding support in decision making and performance of the Portuguese Military Academy (AM). The AM is a military higher education institution that requires great financial and human resources management. The organization could benefit from management accounting to improve performance and decision-making while pursuing its scope of training future Army and Republican National Guard officers. The Accounting Standardization System in Portuguese Public Administration (SNC-AP) requires information supporting the management of internal processes to determine costs and contribute to improving decision-making. Hence, the SNC-AP contemplates norm 27 (NCP 27) dedicated to management accounting, which is based on the ABC method to calculate the structural costs and the products/services produced. This study tested the hypothesis by adopting quantitative analysis on statistical data collected through a questionnaire. Correlations between variables, multiple linear regression, and analysis of statistical differences were used. The sample consisted of 32 militaries and civilians with responsibilities supporting decision-making and organizational performance at the AM. The results show that management accounting has a positive influence for the entire organizational structure of the AM, especially at the tactical organizational level (medium and long-term plans), highlighting the importance of the financial resources consumed (as input) and the products produced by the organizational structures (outputs).

KEYWORDS: ABC method. Military higher education. Management accounting. Decision making. Public performance.

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A contabilidade de gestão e a aplicabilidade do método ABC no ensino superior militar da Academia Militar: um modelo de apoio à tomada de decisão e de desempenho

Resumo

O presente artigo tem como objetivo analisar a importância da contabilidade de gestão (CG) e a aplicabilidade do método *activity based costing* (ABC) no ensino superior militar português, nomeadamente no apoio à tomada de decisão e ao desempenho da Academia Militar (AM) portuguesa. A AM, sendo uma instituição de ensino superior militar, exige grande gestão de recursos financeiros e humanos para a formação de futuros oficiais de Exército e de Guarda Nacional Republicana, podendo ser favorecida com o uso da CG no seu apoio ao desempenho e à tomada de decisão. O Sistema de Normalização Contabilística na Administração Pública portuguesa (SNC-AP) exige informação que possa apoiar a gestão nos processos internos no apuramento de custos e na tomada de decisão de uma instituição. Dessa forma, o SNC-AP contempla a norma 27 (NCP 27) dedicada à CG, que se baseia no método ABC como forma de apuramento dos custos estruturais e dos produtos e/ou serviços. Ao nível da metodologia, foi efetuada uma análise quantitativa, mediante recolha de dados estatísticos por questionário, para testar as hipóteses. Recorreu-se a correlações entre variáveis, uma regressão linear múltipla e análise de diferenças estatísticas. A amostra recaiu em 32 militares e civis com responsabilidades no apoio à tomada de decisão e no desempenho organizacional da AM. Os resultados mostram que a CG constitui uma influência positiva para toda a estrutura organizacional da AM, mais precisamente ao nível organizacional tático (médio e longo prazo), relevando-se a importância dos recursos financeiros consumidos e dos produtos gerados pelas estruturas organizacionais.

PALAVRAS-CHAVE: Método ABC. Ensino superior militar. Contabilidade de gestão. Tomada de decisão. Desempenho público.

Contabilidad de gestión y aplicabilidad del método ABC en la educación superior militar de la Academia Militar: un modelo de apoyo a la toma de decisiones y al desempeño

Resumen

Este artículo tiene como objetivo analizar la importancia de la contabilidad de gestión y el método ABC en la educación superior militar portuguesa, particularmente, en el apoyo a la toma de decisiones y al desempeño de la Academia Militar Portuguesa. La Academia Militar Portuguesa es una institución militar de educación superior que requiere una gran gestión de los recursos financieros y humanos para la formación de futuros oficiales del Ejército y de la Guardia Nacional Republicana, que puede verse favorecida por el uso de la contabilidad de gestión para respaldar el desempeño y la toma de decisiones. El Sistema de Normalización Contable de la Administración Pública Portuguesa (SNC-AP) requiere información que puede apoyar la gestión en los procesos internos de determinación de costos y toma de decisiones de una institución. De esta forma, el SNC-AP contempla la norma 27 (NCP 27) dedicada a la Contabilidad de Gestión, la cual se basa en el método ABC como forma de calcular los costos estructurales y de los productos y/o servicios. A nivel metodológico, se realizó un análisis cuantitativo, mediante la recopilación de datos estadísticos por cuestionario, para probar las hipótesis. Se utilizaron correlaciones entre variables, regresión lineal múltiple, así como análisis de diferencias estadísticas. La muestra estuvo conformada por 32 militares y civiles con responsabilidad de apoyar la toma de decisiones y el desempeño organizacional de la Academia Militar. Los resultados muestran que la contabilidad de gestión tiene una influencia positiva en toda la estructura organizacional de la Academia Militar, más precisamente a nivel organizacional tático (mediano y largo plazo), destacando la importancia de los recursos financieros consumidos y de los productos generados por las estructuras organizacionales.

PALABRAS CLAVE: Método ABC. Educación superior militar. Contabilidad de gestión. Toma de decisiones. Desempeño público.

INTRODUCTION

Currently, public organizations should work optimizing their performance and their indices of economy, efficiency, effectiveness, and productivity (ALFORD and O'FLYNN, 2009; MOORE, 2012; GOMES, FERNANDES and CARVALHO, 2016). Implementation of adequate management accounting systems is essential to improve public performance (TEIXEIRA, 2016), and should be used in the various organizational level structures (GRANOF, PLATT and VAYSMAN, 2000; OSEIFUAH, 2014).

The current accounting system for Portuguese public administrations recommends the cost accounting based on the activity-based costing (ABC) method, through public accounting standard norm 27 (NCP 27). This system is based on the approved Accounting Standardization System (SNC-AP) by Decree-Law No. 192/2015 of September 11 (PORTUGAL, 2015). Despite being published in 2015, there were several extensions, leading only to its mandatory applicability to the Education subsector from January 1, 2019.

To optimize the organizational performance of the Portuguese Military Academy (AM), it is important that the existing resources (inputs) generate the desired products (outputs), in quantity and quality, through the development of activities, resulting in adequate results (outcomes) for society (DOOREN, 2006; OECD, 2009; BOUCKAERT, 2013).

Since the AM is a military higher education institution and the management accounting (MA) has not yet been implemented in the army, due to the lack of information (MENDONÇA, 2020), to improve the decision-making process and the performance, it is important to verify which organizational structures give greater importance to MA.

This article, therefore, seeks to answer the following research question: *How does management accounting, through the applicability of the ABC method, influence decision support and the Military Academy performance?*

As a theoretical contribution, it was found that the MA, at the public sector level, has a positive influence on decision support at all organizational levels term (short, medium, and long). However, it is in the medium and long term that this influence is most important. In terms of practical contribution, it appears that public organizations should give greater emphasis to MA, as a relevant instrument to obtain information at the right time, serving as a support for everyday decisions, with an impact on the present and future of organizations.

Regarding the structure of this article, a brief introduction to the topic under study is carried out, where is presented the research question that the article seeks to answer. Then, a literature review of the subject is carried out, which is complemented and grounded through several relevant articles. The literature review is divided into five subchapters, that expose, in a coherent and structured way, the fundamental concepts and themes for the investigation. In the methodology are presented the research objectives and hypotheses, data collection methods, population, sample, and data analysis techniques. Finally, the results and main conclusions of this investigation are presented, to answer the research question.

THEORETICAL FRAMEWORK

MA in decision-making support

The main function of a MA system is product relevant information of costs, yields and results, to enable a correct and effective performance of certain processes, such as budget preparation, pricing, tariffs and fees, production costs, economic decisions and performance measurement and evaluation – economy, efficiency, effectiveness, and quality – (TEIXEIRA, 2016).

According Galvão and Teixeira (2019), the importance of MA in public administration is increasingly highlighted, which can present different perspectives of analysis, standing out these: legal, management support and analysis, evaluation, and comparison of performances.

Several authors consider that MA, in decision-making support, has a positive influence on organizational structures management (BURNS and BALDVINSDDOTTIR, 2005; NOR-AZIAH and SCAPENS, 2007; VICENTE et al., 2009; MAT, 2010; VICENTE, MAJOR and PINTO, 2011). Furthermore, the implementation of MA must be decentralized and directed to core business/activities (BURNS and BALDVINSDDOTTIR, 2005).

Decision making can be defined as an important cognitive process, that consists of choosing, between two or more alternatives, a solution to a problem. Within an organization, this process is carried out by a group of professionals, in a continuous and dynamic way, to improve its performance. This process, constitute a vital method to the functioning of all organizational sectors (SMELSER and BALTES, 2001).

Every day, organizations must deal with a huge amount of information. If one of the production sectors has low efficiency in their process, the entire management is compromised. Therefore, high performance is synonymous of good management (RISHER, 2003). Performance indicators are used, to increase the production process, through which it is possible to obtain quantitative and qualitative information that guide managers in decision making.

The decision-making process is strongly influenced by the management functions and the organizational structure. Any manager, responsible for organizational development and learning, argues that the management skills needed involve a mixture of three different sets of elements: proficiency and aptitude demonstrated in daily actions; knowledge, expertise and experience in decision making; personal treatment, attitudes, and values (DEMETER and ȚAPARDEL, 2013). Therefore, these three sets of elements can be described as perception of acting manager skills, based on what he needs to know (knowledge), and attitude to adopt when deciding or implementing a policy (DEMETER and ȚAPARDEL, 2013).

Organizational performance through management accounting

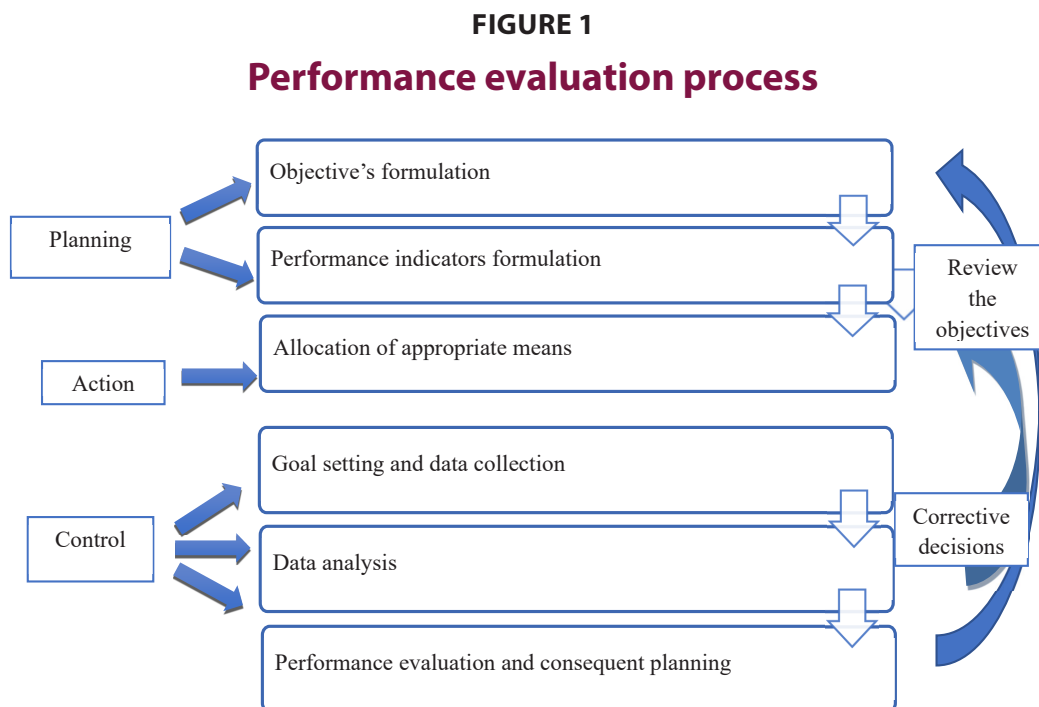
In the last decade, there has been a significant change of organizing and managing work. Several books have been written about new work management practices, as well showing the experience of prominent companies. These changes had as main objective the improvement of organizational performance (RISHER, 2003).

Performance management deals with the challenge that organizations face when defining, measuring, and stimulating the performance of workers (DEN HARTOG, BOSELIE and PAAUWE, 2004). This management should involve the organization and your workers, to improve processes, behaviour, motivation, teamwork, dialogue, management style and organizational attitudes (RADNOR and BARNES, 2007; NEVES, 2011). Therefore, the main goal of public organizational performance is to align the performance of professionals with the company's objectives and bring better and better results. To achieve this goal, performance measurement is essential (BOUCKAERT, 2013; SOUAF, WAZANI and MOUADILI, 2015).

Despite performance measurement in the public sector is a relatively recent topic, a substantial amount of literature on performance management has been developed and published, covering topics such as: performance measures, performance indicators, quality assurance, among others. This literature mirrored a parallel development where the language of performance became an almost ordinary feature of work in public sector organizations (BOLAND and FOWLER, 2000).

The MA is a fundamental tool, which should be part of the accounting system, since it enables the analysis and control of costs, that play a crucial role to improve organizational performance (TURNERY, 2010; ABRAHMAN et al., 2016; FEITOR, 2018).

The performance measurement process seeks to optimize the execution of what was planned, with the use of indicators, to introduce corrective measures, or if necessary, review the defined objectives, as shown in Figure 1.



Source: Adapted from Reifschneider (2008) and Gomes (2019).

To measure performance with better precision, there were developed some basic tools, like a series of indicators, that could be applied to manage the organizational system. These tools make possible to evaluate the various organizational processes, as well to adjust and consequent improve the planning already defined.

The indicators can be subdivided into several different types, according to different opinions about which would be the main ones. According to Stevens et al. (2006), the indicators that could be emphasized are: i) productivity; ii) quality; iii) performance management and iv) capability. Productivity indicators point to the quantity produced of a given product or service, measuring the proportion of resources consumed and relating it to the outputs of the processes. In turn, quality indicators assess the effectiveness of the production process, focusing on user's satisfaction statistics and indicating the value to be attributed to the final consumer. Performance management indicators assess the process of providing products and/or services, reflecting performance in relation to critical success factors. Finally, capability indicators measure the responsiveness of a process in each organization.

Other benchmarks for measuring performance and equal relevance are the following: economy, efficiency, productivity, and effectiveness (DOOREN, 2006).

For a public organization to optimize its organizational performance, indicators must be applied to measure the components of the public management cycle (GOMES, 2019). These components include the inputs (resources) that go to the organization; the activities developed; the outputs (products and services) produced based on these inputs; and the outcomes (results achieved) that result from the outputs. So, organizational performance is obtained through an adequate combination of these components: inputs, activities, outputs, and outcomes (BOUCKAERT, 2013).

MA and the ABC method in Portuguese Public Administration

Before the SNC-AP implementation, the Official Public Accounts Plan and its sectoral plans constituted the system responsible for report the accounting financial information. However, due to its fragmentation and outdatedness, this system did not meet the requirements of adequate planning, reporting and financial control. Thus, the SNC-AP was implemented, which adopted international accounting standards, in the context of the Portuguese reality, of the business sector and of the non-profit private sector.

The SNC-AP was approved by Decree-law no. 192/2015 of September 11 (PORTUGAL, 2015). However, its full application was postponed and scheduled for January 1, 2020.

According to the preamble (PORTUGAL, 2015), the SNC-AP will make it possible to implement the accrual regime in the accounting and financial reports of public administrations, articulating it with the current cash base modified, and establishing the foundations of a State Budget on an accrual basis (AZEVEDO, 2018).

So, the SNC-AP main objectives are the fully implementation of the accrual basis in the accounting and financial reporting of public administrations and promote accounting harmonization (national and international), developing a single accounting benchmark for the Portuguese public administrations. The standardization of procedures and the increase in the reliability of the consolidation of accounts are also part of the objectives. These standardizations take into account

the needs of some information users like: users of public services, citizens in general, other funders, Parliament and/or assemblies, executive bodies – central, regional or local government, public managers, budget authorities, statistics and supervision and inspection.

Within the scope of management accounting, the SNC-AP contains a specific standard for this purpose, namely public accounting norm no. 27 (NCP 27). Article 1 of this norm has as its main objective: “[...] establish the bases for the development of a management accounting system in Public Administrations” (PORTUGAL, 2015, p. 7776).

This standard has two purposes, namely the external aspect and the internal aspect. The two types of users imply the existence of “[...] relevant and analytical information on costs and eventually on income and results, to satisfy the different information needs” (TEIXEIRA, 2013, p. 5). Such needs may arise in the planning and control functions, in the budgeting process itself, in the calculation of production costs, in the determination of rates, prices and tariffs that may later play a major role in the economic decision and evaluation.

Point 3.2 of the NCP 27 (PORTUGAL, 2015) provides different costing systems, namely: total costing system; variable costing system; direct costing system; rational costing system and standard cost, which can be implemented in determining the costs of products or services of the different subsectors of Public Administration.

Costing systems are based on the distinction between fixed and variable costs. This distinction is made according to the variation of cost in relation to production volume, assuming a fixed period. On the one hand, the cost is called variable if the total costs varies in direct proportion to the volume of production; on the other hand, it is called fixed when its total does not vary with the volume of production (FERREIRA, 2007).

The dissemination of information, on the public resources management, is essential for society to assess the way in which its taxes are applied. With the SNC-AP and NCP 27, it is intended to respond to the challenges constantly posed in public accounting, so that it allows the accomplishment of indicators capable of assisting decision-making, measuring the performance of entities, as well as planning and controlling the situation (AZEVEDO, 2018; LOUREIRO, 2019). It is also worth mentioning the fact that the adoption of the MA continues to be with a small development in the public sector, since there is no knowledge about the results of the activities developed, as well as the defined objectives (JACINTO, 2018; LOUREIRO, 2019). NCP 27, in its point 5.1, focuses on the ABC method, which is based on activities, that is, activities consume resources and not products. The ABC method requires steps that help the process of calculating the costs of products and services. According to NCP 27, these steps are:

- Identification of activities (main and auxiliary);
- Allocation of costs to activities;
- Identification of the most suitable cost drivers for each activity that will later be used to allocate the activities' expenses to the final objective;
- Calculation of the unit cost of each cost driver;
- Attribution of the costs of activities to the products and services generated by multiplying the unit cost of each cost driver by the quantities of this inductor consumed by each product or service.

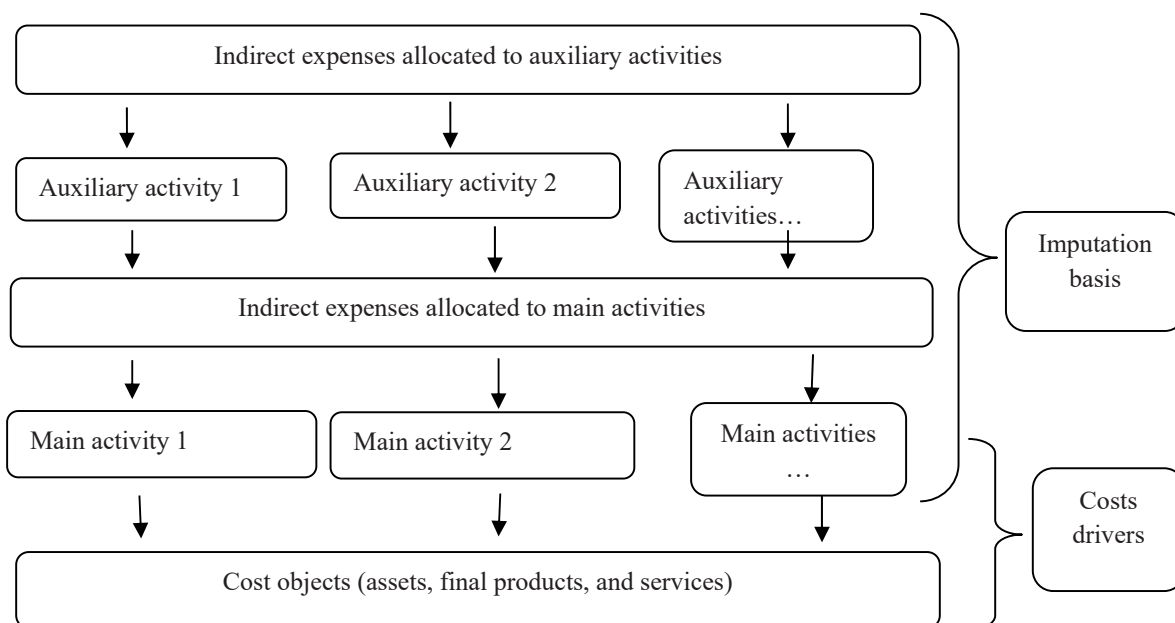
The ABC method has two phases: in the first, costs are allocated to activities considering the consumption of resources, expressed by the cost drivers. In the second phase, the costs of activities are related to the outputs, through the cost drivers of the activities, based on their respective consumption (INNÉS and MITCHELL, 2005).

The SNC-AP implementation manual (COMISSÃO DE NORMALIZAÇÃO CONTABILÍSTICA, 2016) states that the compliance of the NCP 27 (dedicated to the MA), in the implementation of a costing system, will be guaranteed if it is subject to a chart of accounts that start with a reclassification public expenditure by nature (financial accounting) to expenditure by cost object (cost accounting) and allows the use of digraph and the calculation of costs by department, function, activity, products and services.

The manual also mentions that, to support the ABC system, regarding the sharing of costs, it is assumed the existence of auxiliary and main activities, to which, if not the totality of the embeddable expenses, at least the indirect expenses with assets, products, and final services (figure 2).

FIGURE 2

The ABC method and her allocation of expenses



Fonte: Adapted from Comissão de Normalização Contabilística (2016).

The MA and the ABC method in Education

“The current economic context, in which there is an increasing concern with the management of public funds, highlights the need for an information system that can help planning and decision-making in higher education institutions” (FEITOR, 2018, p. 94). The ABC method is the most appropriate costing system for public higher education institutions. This system has benefits compared to traditional costing systems, in terms of distribution of indirect and common costs to the various organizational structures, allowing, through a more accurate analysis, to comply with legality and support management in decision making (FEITOR, 2018).

As the SNC-AP does not present any chart of accounts and NCP 27, in turn, establishes guidelines for the MA implementation in the public administration, it is possible to respond to the information needs that the teaching institutions intends (TEIXEIRA, 2016). This norm, not specifically applied to public higher education, reinforces in its paragraph 35 that, in the Education subsector, it is essential to have data provided by the cost accounting system. It also mentions that they must be provided (PORTUGAL, 2015, p. 7780):

- (a) For each course, specifying the direct and indirect costs, the cost per student, the imputed revenues, where applicable, and the economic results;
- (b) For each research centre, identifying the cost per project and respective income (financing, service provision contracts);
- (c) For each service provided to the community, including direct and indirect costs and the respective income and economic results;
- (d) For each student support activity, identifying the cost for each meal, cost per student/bed, cost for each user in the sports activity, cost for each student beneficiary of grants/awards, cost per user in the medical activity (clinic /psychology, ...).

The main activities are those that directly contribute to the final product and the auxiliary activities are those that only assist the main activities in achieving the final product. In the Education subsector, the main activities are: teaching; investigation; support to users; community service delivery; production for the entity itself and other activities. Auxiliary activities are as follows: administration and direction; administrative and financial services; human resources; academic management; technical support (IT, maintenance, surveillance, etc.) and others.

In the main activities whose inducer cost are teaching hours, the final cost can be divided between the different costs, namely: course, student, class, or curricular unit. Research activity can also be divided by research projects or centres (COMISSÃO DE NORMALIZAÇÃO CONTABILÍSTICA, 2016).

Although different cost distribution bases can be used, the standard is indirect costs are first distributed to the main activities and only later to the final product, depending on the total working hours of the activities and products.

Currently, it is essential to understand the importance of management accounting and to overcome the difficulties of its implementation (FEITOR, 2018).

The organizational structure of the Portuguese Military Academy

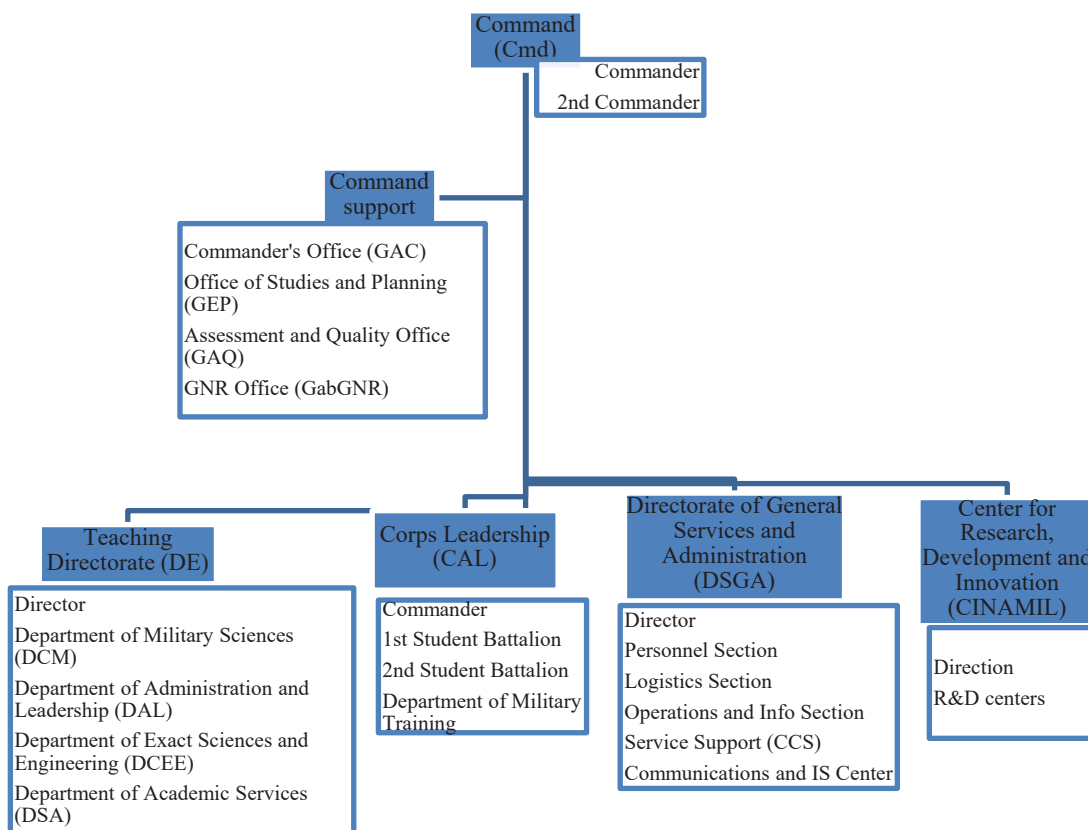
According to Ordinance No. 22/2014 of January 31 (PORTUGAL, 2014), the Portuguese Military Academy (AM), is a public military university. According to article 2, the AM's mission is to: train officers destined for the permanent staff of the Army and the National Republican Guard (GNR), enabling them to perform the functions that are statutorily assigned; conferring the appropriate competences to fulfil the missions of the Army and the GNR; and promoting individual development for the exercise of command, direction, and leadership functions.

The AM is part of the public higher education system, although adapted to meet the needs of the Army, as well as the GNR. It is characterized, according to article 5 (PORTUGAL, 2014, p. 804), by:

- a) Aim to prepare highly qualified staff with the skills and ability to command in situations of risk and uncertainty typical of armed conflict, in response to the demands of security and national defence;
- b) Basic scientific training of a technical and technological nature, aimed at satisfying the professional qualifications essential for the performance of technical functions within the scope of each of the specialties;
- c) A behavioural training embodied in a solid military, moral and civic education, developing in the students command, direction and leadership qualities inherent to the military condition;
- d) Physical preparation and military training, providing to students the physical resourcefulness and the training that are essential for the fulfilment of their missions.

To fulfil its mission and attributions, the article 8 (PORTUGAL, 2014) defines that AM is organically structured as illustrated in Figure 3. This structure also stems from its organic framework (FONSECA, 2020).

FIGURE 3
Organizational structure of Portuguese Military Academy

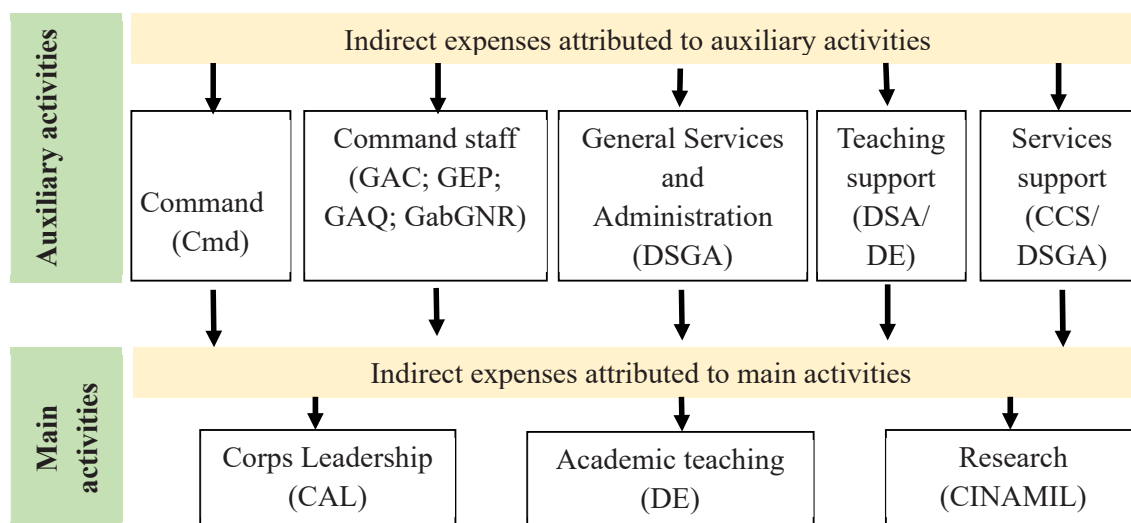


Source: Elaborated by the authors.

At the MA level, considering what is recommended in the SNC-AP implementation manual, it is assumed the existence of auxiliary and main activities, to which, if not the totality of the embeddable costs, at least indirect expenses with final assets, products, and services. Expenses can also be divided by organic classification, if the entity intends to obtain expenses by departments, services, divisions, or other types of organic unit (COMISSÃO DE NORMALIZAÇÃO CONTABILÍSTICA, 2016).

The allocation of expenses to the organizational structure of the AM, through the ABC method, would follow what is represented in Figure 4:

FIGURE 4
Cost allocation by the ABC method to the Military Academy



Source: Adapted from Comissão de Normalização Contabilística (2016).

METHODOLOGY

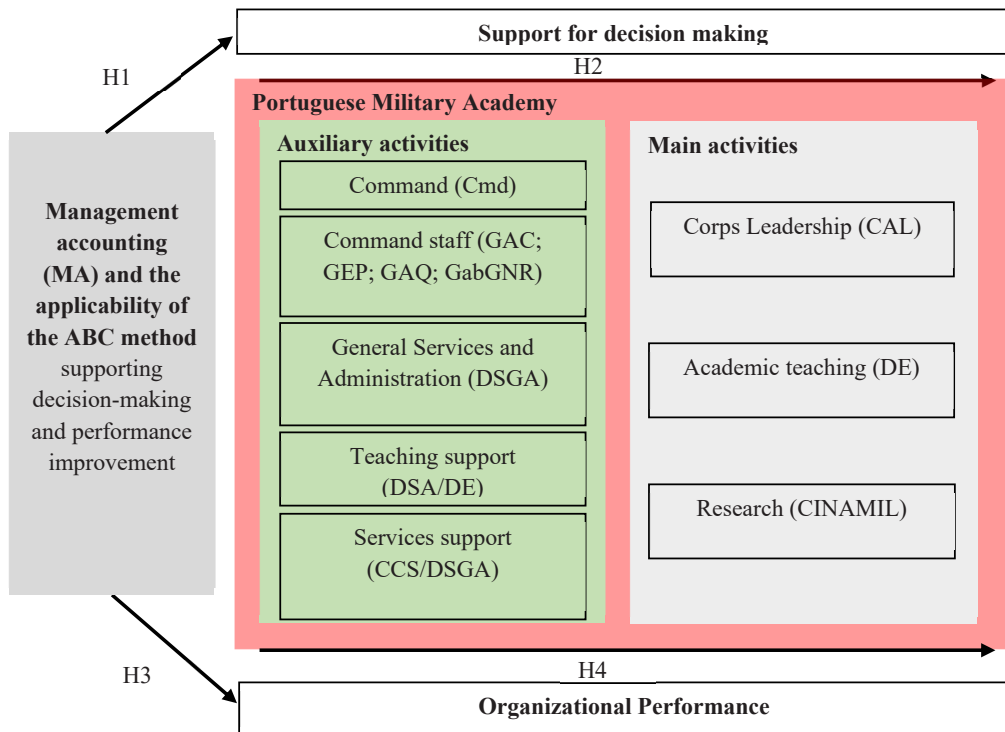
Research objectives and hypotheses

The MA, with the use of the ABC method, allows optimizing the activities that have a greater impact on the products, and, hence, supporting decision-making at different organizational levels to improve private organizational performance (COOPER and KAPLAN, 1991; TURNEY, 2010) and public (TEIXEIRA, 2013; OSEIFUAH, 2014; GRANO, PLATT and VAYSMAN, 2000). However, there are authors who consider that the MA and the ABC method, when monitoring the processes and identifying the activities costs, fundamentally support the decision at the strategic level, at the long term, (2 to 3 years) (GUPTA and GALLOWAY, 2003; MOISELLO, 2012).

Regarding the influence of decision-making on organizational performance, several researchers refer that the application of an adequate decision-making process is essential to improve performance (UZELAC et al., 2016; ABUBAKAR et al., 2019).

Thus, in accordance with the literature review carried out, to answer the research question, it is important to evaluate how MA can contribute to support decision-making at the different organizational levels and in the various activities carried out, optimizing, therefore, organizational performance. The research model implicit in this investigation is described in Figure 5, proposing the following hypotheses:

FIGURE 5
Research model and hypotheses



Source: Elaborated by the authors.

H1: Management accounting has a positive influence on the decision-making of the Military Academy's organizational structure.

H2: The average importance of management accounting in supporting the decision of auxiliary activities is equal to the main activities.

H3: Management accounting in support of decision-making has a positive influence on the performance of the Military Academy.

H4: The average importance of management accounting for the performance of auxiliary activities is equal to the main activities.

Data collection and analysis method

In order to answer the research question, a self-authored questionnaire was developed for the military and civilians who make part of the organizational structure of AM's decision-making support (Appendix). This questionnaire is structured to analyse how management accounting influences

their activities in terms of their decision support and in the performance of their organizational structure. The scale adopted to measure the items was the 5-point Likert scale.

With the purpose of analysing potential differences in importance attributed by those responsible of auxiliary and main activities and having the questionnaire variables measured by the Likert scale, it is usual to apply parametric tests (MARÔCO, 2014). These tests are based on certain assumptions, namely the normality of the distribution and the homogeneity of the variances. So, it is essential, when preparing these tests, the analysis of these assumptions. However, for samples greater than 30 respondents, the violation of these assumptions does not have serious consequences (MARÔCO, 2014).

In comparing the averages between the MA sections (auxiliary and main), the parametric t-Student test was used. It is the most suitable for analysing averages of the same variable or characteristic observed on two independent individual samples (POCINHO and FIGUEIREDO, 2000).

Bivariate linear correlations (Pearson's R) were also made to determine the influence exerted by the linear association between the respective variables (BRITES, 2016). Correlations above 0.9 indicate a very strong positive influence; between 0.7 and 0.9: strong; between 0.5 and 0.7: moderate; and between 0.3 and 0.5: weak (MUKAKA, 2012).

Multiple linear regressions were also performed to model the relationships between the variables and predict the response of the dependent variable based on the independent variables (BRITES, 2016), when the explanatory model was greater than 50% (adjusted R^2). These percentage is satisfactory for an exploratory study (MARÔCO, 2014).

Quantitative analysis was performed using the statistical program IBM SPSS Statistics 22.0.

The variables considered for the analysis of the influence of the MA in decision-making support and organizational performance are shown in Box 1.

BOX 1

Variables defined under study

Latent variables	Observed variables	Items	Source
	Components of the public management cycle	<i>Inputs</i> Activities <i>outputs</i> <i>Outcomes</i>	Bouckaert (2013)
Decision making support	Performance measurement	Economy Efficiency Efficiency Productivity Quality	Dooren (2006)
	Activities	Auxiliaries Main	Comissão de Normalização Contabilística (2016)

Continue

Latent variables	Observed variables	Items	Source
Organizational performance	Organizational levels	Strategic (2 to 3 years) Tactical (1 to 2 years) Operational (less than 1 year)	Cooper and Kaplan (1991)
	Activities	Auxiliaries Main	Comissão de Normalização Contabilística (2016)

Source: Elaborated by the authors.

Quantitative data was obtained via a questionnaire carried out by the authors, to a (convenience) sample of 61 respondents. This questionnaire was applied to soldiers and civilians who perform leadership roles and who have responsibilities in decision-making support and organizational performance. The response rate was 52.4%, with 32 respondents participating.

All questions used a 5-point Likert scale with the attribute of importance.

Presentation and Discussion of the Results

The results allow us to accept H1, since the MA positively influences the organizational structure of AM, in terms of the components of the public management cycle (inputs, activities, outputs and outcomes), and in terms of performance measurement variables. As for the importance of MA for decision making, at the level of the AM organizational structure, was obtained the data presented in Table 1.

TABLE 1
Correlations between the influence of GC for decision making

Observed variables	What is the importance of GC for decision making, at the organizational structure level?	
Components of the public management cycle	Of the human resources for which you are responsible	.789 (**)
	Of the financial resources consumed	.933 (**)
	Of the activities carried out	.850 (**)
	What is produced	.880 (**)
	The cost associated with supporting other structures	.625 (**)
	At the level of the results obtained	.715 (**)

Continue

Observed variables	What is the importance of GC for decision making, at the organizational structure level?	
Performance measurement	Economy	.832 (**)
	Efficiency	.715 (**)
	Efficiency	.713 (**)
	Productivity	.525 (**)
	Quality	.567 (**)

Note: ** indicate $p < 0.01$

Source: Elaborated by the authors.

Analysing the results in more detail, despite the MA having a positive influence on the entire AM organizational structure, a very strong influence of the financial resources consumed (0.933) stands out. In terms of the human resources for which it is responsible, of the activities carried out, in what is produced and at the level of results obtained, the influence is strong.

Performance measurement in terms of economy, effectiveness and efficiency also has a strong positive influence. Finally, although productivity, quality and cost associated with supporting other structures have a positive influence, their values are moderate.

Regarding H1, concerning the linear model that explains the MA importance in decision-making to the AM organizational structure, as well to the components of the public management cycle, the results¹ were as shown on Table 2:

TABLE 2
Multiple linear regression test results

Model (Importance of MA in decision support at the level of the public management cycle components) - CGAD	Unstandardized coefficients		Standardized coefficients	t	Sig.	Collinearity Statistics	
	B	Type III error	Beta			Tolerance	VIF
(Constant)	0.506	0.492		1,029	0.316		
Of the human resources for which you are responsible (HR)	0.127	0.132	0.132	0.957	0.35	0.375	2,664
Of the financial resources consumed by your organizational structure (FR)	0.724	0.249	0.671	2,912	0.009	0.134	7,471
Activities carried out by its organizational structure (AD)	-0.086	0.204	-0.077	-0.42	0.679	0.212	4,711

Continue

¹ There aren't multicollinearity problems, since the VIF values are less than 10 (MARÔCO, 2014).

Model (Importance of MA in decision support at the level of the public management cycle components) - CGAD	Unstandardized coefficients		Standardized coefficients	t	Sig.	Collinearity Statistics	
	B	Type . error	Beta			Tolerance	VIF
What is produced by your organizational structure (OP)	0.684	0.247	0.573	2,768	0.012	0.166	6.018
The cost associated with supporting other structures to your organizational structure (CA)	-0.355	0.15	-0.299	-2,371	0.028	0.447	2,236
In terms of the results obtained by its organizational structure (RO)	-0.229	0.185	-0.172	-1,236	0.231	0.367	2,724

Source: Elaborated by the authors.

Based on the model developed (adjusted $R^2 = 81.5\%$), the results obtained allow us to define the following equation:

$$CGAD = 0,506 + 0,127 RH + 0,724 RF - 0,086 AD + 0,684 PO - 0,355 CA - 0,229 RO$$

Thus, it can be seen that the perceived effect on the influence of MA in the decision support of the various components of the public management cycle is high in terms of the importance of the financial resources consumed (input) and of the products of organizational structures (outputs). When there is an increase of 1 point in the importance of MA in decision support, there is an increase, on average, of 0.724 points in the importance of the financial resources consumed and of 0.684 points in the importance of what is produced by the organizational structure (output). As for the average importance of the cost associated with the support of other structures to organizational structures, there is a decrease of 0.355.

As for the importance of MA, with the applicability of the ABC method for decision-making at the level of its organizational structure, in the auxiliary sections and in the main sections, the following results were obtained in Table 3, to check H2.

TABLE 3
Averages of importance of the MA in the decision support of the sections

Average importance of MA in decision support	Auxiliary Sections		Main Sections		T -Test
	Average	σ	Average	σ	
In a general way	4.60	0.516	4.20	0.941	1,221
Long term (2 to 3 years)	4.30	0.675	4.07	0.884	0.747
Medium/long term (1 to 2 years)	4.50	0.707	4.07	0.961	1,297
Short term (less than 1 year)	4.30	1.059	4.00	1,069	0.691

Continue

Average importance of MA in decision support	Auxiliary Sections		Main Sections		T -Test
	Average	σ	Average	σ	
Economy	4.20	1.033	3.20	1,424	2,133*
Efficiency	4.20	0.919	3.33	1,759	1.607
Efficiency	3.90	0.994	3.13	1,642	1.453
Productivity	4.00	1.054	3.20	1,612	1.5
Quality	4.10	0.994	3.33	1,633	1.458

Note: * Statistically significant difference for $p < 0.05$.

Source: Elaborated by the authors.

The data in Table 3 allow validate H2, since the average importance of MA for the performance of auxiliary activities is the same as for the main activities, except for the relative importance in decision making in economic terms, whose difference of the sections is statistically significant. It appears that the auxiliary sections (comprising the Command, the administrative and financial support sections) give greater importance to the MA in the economic measurement of AM.

The results obtained also allow us to accept H3, verifying that MA in support of decision-making has a positive influence on AM performance. However, despite all the correlations being positive and, for the most part, statistically significant, the correlation values have different intensities, as shown in Table 4.

TABLE 4
Correlations between the influence of MA on decision support of AM performance

Influence of MA (as a decision support tool) on AM performance	
In a general way	.599 (**)
Long term (2 to 3 years)	.625 (**)
Medium/long term (1 to 2 years)	.704 (**)
Short term (less than 1 year)	.590 (**)

Note: ** indicate $p < 0.01$

Source: Elaborated by the authors.

The results allow us to confirm that MA, through the applicability of the ABC method as a decision-making support tool, has a strong influence on AM performance at the medium and/or long-term (tactical) level. For the remaining decision levels (long and short term), the influence is moderate.

Regarding the importance of MA for the organizational structure of AM performance, the data obtained (Table 5) also allow validate H4, verifying that the average importance of MA for the performance of auxiliary activities is equal to the activities main.

TABLE 5
Importance of MA for the performance of your organizational structure

How important is the MA to the performance of your organizational structure?	Auxiliary Sections		Main Sections		T -Test
	Average	σ	Average	σ	
In a general way	4.30	0.823	3.80	1.014	1,297
Long term (2 to 3 years)	4.30	0.675	3.87	0.99	1.205
Medium/long term (1 to 2 years)	4.40	0.699	3.93	0.961	1,317
Short term (less than 1 year)	4.50	0.972	3.87	0.915	1,654
Economy	4.10	0.994	3.47	1.407	1,229
Efficiency	4.20	1,229	3.33	1,543	1,486
Efficiency	4.10	0.994	3.13	1.457	1.827
Productivity	4.10	1,197	3.47	1,598	1,067
Quality	4.00	1.155	3.47	1,506	0.947

Source: Elaborated by the authors.

Although no statistically significant differences were found, in general terms more importance is given to the MA for auxiliary sections performance. These sections emphasize MA in short-term performance and in organizational efficiency. In relation to the main sections, is given greater relevance to MA in the medium/long term, and the indicators economy, productivity and quality are the ones that stand out as the least important.

CONCLUSIONS

The results of the present investigation allow us to accept hypotheses 1, 2, 3 and 4, despite the existence of different impacts in relation to the observed variables. In other words, in response to the research question, we can conclude that MA has a positive influence, in terms of decision-making in the organizational structure and in terms of AM performance. Thus, the applicability of the ABC method will be essential in supporting decision-making and in the performance of the various activities, through the identification and allocation of costs to the different activities (auxiliary and main) of AM. However, a greater importance was highlighted to the performance of auxiliary activities, related to Command activities in the support of the MA; Command support; administrative and financial services; teaching support and service support (CCS/DSGA).

As for decision making, the importance of financial resources, consumed by organizational structures and the products generated, is emphasized. This last variable, associated with what is produced by the main sections, was not considered as important as the one related to the level of auxiliary sections. This result needs to be further investigated in the future, in terms of analysing the knowledge that the sections have about the potential of MA and the applicability of the ABC method.

Regarding performance, it was found that the MA and the applicability of the ABC method, as a decision-making support tool, has greater influence at the tactical level, that is, in the medium and long term (1 to 2 years). It is thus verified that, contrary to what is defended by Gupta and Galloway (2003) and Moisello (2012) and in line with Granof, Platt and Vaysman (2000), Teixeira (2013) and Oseifuah (2014), MA as a tool decision-making support, at the public sector level, has influence at all organizational levels; however, in the medium and long term, this influence is more important.

In theoretical terms, this article contributes to the literature on the applicability of MA and the ABC method in higher education. With this article, it was found that the MA, at the public sector level, has influence on decision support (short, medium and long term) at all organizational levels; however, this influence is more important in the medium and long term. The ABC method would be an essential instrument supporting decision-making and in the MA performance of auxiliary and main activities (sections), more precisely in the management of financial resources (input) and the products of organizational structures (outputs). The results also show that the auxiliary sections (which comprise the Command, the administrative and financial support sections) give greater importance to the MA than the main sections.

As for the practical implications, the results show that the adoption of MA and the applicability of the ABC method would benefit the decision-making process and the performance of all structural sections, more precisely the sections that indirectly contribute to the products (outputs). These (auxiliary) sections are fundamental to the functioning of the main sections. In this way, it would be possible to optimize the management of financial resources (input) and the products of organizational structures (outputs).

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APPENDIX

Questionnaire guide

This questionnaire is intended for the preparation of a scientific article within the Curricular Unit of Management Accounting I.

This questionnaire intends to collect the opinion of the military and civilians who are part of the organizational structure of decision support, trying to analyse how management accounting influences the activities of the Military Academy (AM) in terms of decision support and performance.

Management accounting, through the efficient recording and control of the costs of internal operations, sharing information with top decision-makers, planning activities, and especially establishing company policies and objectives, plays a key role today.

The pursuit of this objective will only be possible with your essential collaboration. The estimated time to complete this questionnaire is 10 minutes.

There are no right or wrong answers. It is only intended to collect the opinion. Your answers are extremely important to the success of this investigation. All responses are anonymous, confidential and for statistical purposes only.

Thank you very much.

Filling Instructions:

Tick the answer(s) to each question as instructed.

All questions are mandatory, except the open questions, if you do not want or do not know how to answer a question, please tick the option “Don’t know/Don’t responde” (DK/NR).

Part I

1. Gender:

- a) male
- b) female

2. The structure in which it performs functions is related to:

- a) Command
- b) Command Support
- c) Training of students
- d) Academic education
- e) Teaching Support
- f) Administrative support
- g) Financial support
- h) Investigation

3. Which structure commands/manages/directs?

- a) Regimental Type / Battalion / Company
- b) Cabinet
- c) Department
- d) division
- e) breakdown
- f) Section
- g) Other

4. How important is it to have cost data (management accounting) for your decision making, at the level of your organizational structure?

(0 = DK/NR; 1 = Not important; 2 = Not very important; 3 = Fairly important; 4 = Important; 5 = Very important)

5. How important is it to have cost data (management accounting) for your decision making, at the level:

(0 = DK/NR; 1 = Not important; 2 = Not very important; 3 = Fairly important; 4 = Important; 5 = Very important)

- a) The human resources for which it is responsible
- b) The financial resources consumed by its organizational structure
- c) Activities developed by its organizational structure
- d) What is produced by its organizational structure (eg: student training)
- e) The cost associated with supporting other structures to your organizational structure
- f) The results obtained by its organizational structure

6. How important is it to have cost data (management accounting) for decision-making at the Military Academy level?

(0 = DK/NR; 1 = Not important; 2 = Not very important; 3 = Fairly important; 4 = Important; 5 = Very important)

- a) In general
- b) Long term (2 to 3 years)
- c) Medium/long term (1 to 2 years)
- d) Short term (less than 1 year)

7. How important is having cost data (management accounting) for the performance of the Military Academy?

(0 = DK/NR; 1 = Not important; 2 = Not very important; 3 = Fairly important; 4 = Important; 5 = Very important)

- a) In general
- b) Long term (2 to 3 years)
- c) Medium/long term (1 to 2 years)
- d) Short term (less than 1 year)

Part II

8. How important is having cost data (management accounting) for your decision making, in terms of?

(0 = DK/NR; 1 = Not important; 2 = Not very important; 3 = Fairly important; 4 = Important; 5 = Very important)

- a) Economy (lower cost of acquiring financial, material, human resources, among others)
- b) Efficiency (best possible result using the fewest possible means)
- c) Effectiveness (satisfying the organization's objectives, regardless of the means)
- d) Productivity (number of activities carried out to train officers)
- e) Quality (existence of characteristics and skills that guarantee quality standards)

9. How important is having cost data for the performance of the Military Academy, in its function, in terms of?

(0 = DK/NR; 1 = Not important; 2 = Not very important; 3 = Fairly important; 4 = Important; 5 = Very important)

- a) Economy (lower cost of acquiring financial, material, human resources, among others)
- b) Efficiency (best possible result using the fewest possible means)
- c) Effectiveness (satisfying the organization's objectives, regardless of the means)
- d) Productivity (number of activities carried out to train officers)
- e) Quality (existence of characteristics and skills that guarantee quality standards)

10. How important are the following cost indicators for your decision making?

(0 = DK/NR; 1 = Not important; 2 = Not very important; 3 = Fairly important; 4 = Important; 5 = Very important)

- a) Cost of products/services consumed by your structure
- b) Cost of products/services of activities developed in AM
- c) Cost of products/services of activities developed by its structure (seminars, curricular units, etc.)
- d) Cost of products produced by its structure (study cycles, students, etc.)
- e) Total cost of the structure that manages
- f) Cost of human resources allocated to its structure (hour/man cost)
- g) Cost of human resources allocated to activities developed in AM (seminars, curricular units, etc.)
- h) Cost of material resources allocated to the activities carried out in the AM (infrastructures, IT material, etc.)
- i) Cost of current living expenses and normal operation allocated to its structure
- j) Cost of current living expenses and normal functioning related to the activities carried out by its structure at AM

11. What other types of indicators would you like to have to support your decision making?

(Open answer)