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ENHANCING INSTRUCTOR SELECTION: A VALUE-FOCUSED PERSPECTIVE IN THE BRAZILIAN AIR FORCE

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ABSTRACT

The Air Force Officers Improvement School plays a crucial role in enhancing intermediate officers, equipping them for administrative, advisory, and operational roles through the Air Force Officers Improvement Course. In this way, the appointment of new instructors for EAOAR emerges as a complex problem, requiring careful structuring. The Value-Focused Thinking (VFT) approach arises as an effective tool to address this issue by enabling an analysis aligned with organizational values. This study aimed to evaluate the impact of the VFT method on the decision-making process for appointing new EAOAR instructors. Initially, detailed interviews with eleven key stakeholders helped identify the values underlying the instructor appointment process. Using IRAMUTEQ software, the stakeholders' preferences were aggregated to reveal the fundamental values and guiding principles. The next step involves implementing the proposed hybrid approach, necessitating further analysis and quantitative research to ensure an informed and fair decision in selecting new EAOAR instructors.

KEYWORDS. Brazilian Air Force. Personnel Selection. Value-Focused Thinking.

Paper topics (Value-Focused Thinking, Personnel Selection, Brazilian Air Force.)

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1. Introduction

The commitment of Brazil to the principles of the United Nations Charter is evident in its active participation in the pursuit of global peace and security. As part of this contribution, in 2022 and 2023, the country held non-permanent seats on the United Nations Security Council (UNSC), a crucial body for maintaining global stability [MRE 2023].

Within this context, enhancing the capabilities of its military personnel to face the challenges of United Nations (UN) peacekeeping operations has been a priority for Brazil. This commitment aligns with the National Defense Policy (NDP), which aims not only to ensure international stability but also to ensure that the Armed Forces are prepared to fulfill their constitutional responsibilities [Brazil 2016].

From this perspective, the modernization of the Brazilian Air Force's Education System is one of its strategic objectives. The aim is to adapt to cultural and pedagogical changes [Brazil 2018]. The Air Force Officers Improvement School (EAOAR) plays a crucial role in this process by enhancing intermediate officers, equipping them for administrative, advisory, and operational roles through the Air Force Officers Improvement Course (CAP).

However, the process of selecting instructors for EAOAR faces challenges related to the complexity of the criteria adopted and the cognitive demand on decision-maker and stakeholders involved in analyzing each candidate. Additionally, emphasizing the final average of students may hinder a balanced evaluation of other relevant criteria.

In complex evaluation settings involving multiple stakeholders with diverse value systems, it is essential to employ a Multicriteria Group Decision Making approach. This approach aims to achieve two complementary goals: first, to create a coherent model that integrates various perspectives and individual value judgments related to the problem at hand; and second, to foster collective alignment around the evolving model and so, apply a specific multicriteria method, as the Measuring Attractiveness by a Categorical Based Evaluation Technique (MACBETH), to calculate the ranking of alternatives [Vieira *et al.* 2020]. In this way, the appointment of new instructors for EAOAR emerges as a complex problem, requiring careful structuring. The Value-Focused Thinking (VFT) approach, proposed by Keeney [1992], arises as an effective tool to address this issue by enabling an analysis aligned with organizational values.

In EAOAR, the selection of new instructors plays a vital role in the effectiveness of educational processes and the quality of training for Brazilian Air Force (BAF) officers. The significance of this study lies in the need for a robust decision-making process to meet institutional demands. The application of the VFT method aims to provide a comprehensive analysis of values and objectives, avoiding decisions solely based on technical criteria1.

In addition, this study enriches the academic understanding of decision making in complex contexts, emphasizing the applicability and benefits of the VFT method in personnel selection problems. The expectation is that the results will be relevant not only for the Brazilian Air Force, but also for other public and private organizations facing similar challenges in value-focused perspective.

The core of this study, therefore, is to explore the following research question: how does the VFT method affect the process of appointment of new instructors for the EAOAR, aligned to the values of the FAB? Thus, the general objective of this work is to evaluate the impact of the application of the VFT method in this decision-making process. The following specific objectives are established: (1) explain the underlying values in this decision-making process; (2) identify the fundamental objectives of this procedure; (3) identify the crucial attributes for appointing new instructors at EAOAR; and (4) indicate alternatives for this selection process.

The content of this article is organized as follows: Section 2 explains a brief bibliographical review, addressing relevant concepts about the Aeronautical Educational System (SISTENS), the values of decision-making processes, the objectives in decision-making, the attributes of a decision-making process, the creation of alternatives and the hybrid multi-criteria approach. Section 3 reports on the research methodology. Section 4 explains the results and discussions. Finally, Section 5 concludes the article.

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2. Literature review

In this section are explained relevant concepts about SISTENS, values of a decision-making process, objectives in decision-making, attributes of a decision-making process, creation of alternatives and hybrid multi-criteria approach.

2.1. Aeronautics Educational System

The SISTENS is a complex and strategic network of educational institutions focused on the training and post-training of military and civilian professionals from Brazil and friendly nations. This system is composed of various institutions, each with its specific mission, but all contributing to the excellence and development of the capabilities of the BAF, as outlined by the National Defense Policy [Brazil 2016].

The teaching macroprocess in the BAF encompasses a variety of activities aimed at both initial training and the continuous development of personnel. The management of personnel training activities involves the design and execution of actions aimed at qualifying and preparing the military personnel who join the Command of the Aeronautics (COMAER). The Directorate of Education (DIRENS) plays a central role in managing the SISTENS [FAB 2022].

In this context, according to Brazil [2020], the EAOAR

> has as its main mission to enhance junior and intermediate officers, aiming at the development of specific competencies for performing administrative, advisory, and operational functions through the Course of Improvement for Air Force Officers Improvement Course.

It is worth noting that the CAP is delivered in three sequential modules, with the first two being conducted in a distance learning format and the third one in person. This is the only course in the BAF where the student body consists of all career officer ranks, including those who ascend to higher officer positions, as well as officers from friendly nations seeking an opportunity to enhance their competencies in Brazil. Therefore, the CAP contributes to achieving the objective of "ensuring the Defense capability for fulfilling the constitutional missions of the Armed Forces", as it enables the provision of adequate human resources tailored to the specificities of the military profession—individuals who are permanently qualified, prepared, and motivated [Brazil 2016].

The teaching staff of EAOAR plays a fundamental role in the SISTENS, serving as the backbone of the entire educational process at the school. Highly qualified instructors and professors shape knowledge, develop skills, and inspire the values of future senior officers in the BAF. The competence and dedication of this faculty ensure that the teaching and learning process meets the required standards of excellence, making them essential for transmitting culture, ethical principles, and the necessary experience to address the challenges of strategic leadership.

2.2. Value-Focused Thinking Approach

The VFT method provides a systematic framework for structuring complex decisions and conducting analyses, emphasizing the importance of values over pre-existing alternatives [Morais et al. 2013]. This approach shifts the focus of decision-making from merely selecting between available options to identifying and prioritizing the underlying values that guide choices. Values, as Keeney [1992; 1996] defines, represent the fundamental beliefs, principles, and objectives that inform both individual and organizational decision-making. In the VFT framework, values act as essential criteria for evaluating alternatives, leading to decisions that are more aligned with stakeholders' core objectives and ethical standards.

VFT method is "a decision-making method that places the qualitative elicitation of decisionmakers' objectives at the beginning of the decision-making process" [Fenkart et al. 2024]. According to Keeney [1996], objectives consist of the decision context, target outcome, and preference direction (e.g., maximize or minimize). These objectives are categorized as either fundamental, which drive interest in the decision, or means objectives, which serve to achieve the fundamental ones. Decision failures often stem from a lack of clarity regarding these objectives and their associated values. Therefore, VFT emphasizes systematic extraction of objectives to

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ensure alignment with stakeholders' priorities, leading to more conscious and satisfactory outcomes. An example of VFT's application is found in De Andrade et al. [2019], who used the method to structure a decision problem related to personnel selection within the Brazilian Federal Police. The VFT method facilitated the identification of risk prevention measures, and the structuring of strategic objectives aimed at achieving long-term goals.

The use of tools such as the power-interest grid by Ackermann and Eden [2011] further supports the VFT approach by identifying and prioritizing stakeholders based on their power and interest levels. This helps in crafting effective strategies for stakeholder engagement [Jolanta 2015; Poplawska et al. 2015; Eden and Ackermann 2021].

Attributes, or the characteristics by which alternatives are assessed, play a crucial role in VFT. Keeney [1992; 1996] outlines three types of attributes: Natural (universally understood), Constructed (context-specific), and Proxy (indirect measures). These attributes, along with guiding criteria that reflect organizational values, facilitate more informed and aligned decision-making processes. For example, Höfer and Madlener [2020] applied VFT in conjunction with the Multiattribute Utility Theory (MAUT) to evaluate energy transition scenarios, demonstrating the method's effectiveness in group decision-making contexts.

The creation of alternatives is another critical aspect of VFT. Rather than focusing on conventional solutions, VFT encourages decision-makers to explore a wider range of possibilities, which can lead to more innovative and value-aligned outcomes [Keeney 1996]. Siebert et al. [2021] underscore that structuring problems effectively and generating diverse alternatives enhances decision satisfaction, particularly when using VFT. Vieira et al. [2024] also provide a guide for organizing objectives and attributes, integrating VFT with multimethodological decision-making approaches.

2.3. Multi-criteria Decision Analysis

Multi-criteria Decision Analysis (MCDA) is widely recognized in management science as a valuable tool for evaluating options in situations involving multiple objectives [Franco and Montibeller 2010]. However, much of the literature has focused less on problem articulation and structuring within MCDA. For instance, Buzan and Abbott [2006] emphasize the utility of mind maps in fostering creativity and organizing ideas, which is crucial for structuring multicriteria problems.

The construction of a well-structured hierarchy of objectives is fundamental to effective MCDA, as it enables decision-makers to consider their goals clearly [Marttunen 2019]. In particular, the VFT Method has been integrated into decision-making frameworks to ensure that objectives and values guide the analysis of alternatives [Keeney 1992]. De Almeida [2013] outlines a comprehensive twelve-step procedure for constructing decision support models, with the VFT Method playing a critical role in the Preliminary Phase of this model.

Franco and Montibeller [2010] highlight the role of problem structuring in MCDA, which involves defining the problem, structuring the evaluation model, and determining the necessary level of participation. When combined with VFT, the decision-making process becomes more robust, as fundamental values guide the identification of criteria in the evaluation of alternatives.

Various methods can be applied to rank alternatives within MCDA. For example, De Souza et al. [2018] propose the AHP-TOPSIS-2N method, which combines the Analytic Hierarchy Process (AHP) [Saaty 1980] for calculating criteria weights with the Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS) [Hwang and Yoon 1981], used to rank alternatives based on their proximity to an ideal solution. In contrast, the ELECTRE family of methods are applied in classification problems where deficiencies in one criterion cannot be offset by strengths in another [Greco et al. 2016; Ribeiro et al. 2021].

Keeney [1992] asserts that incorporating multicriteria approaches into VFT enhances decision quality by providing a comprehensive framework for analyzing and selecting alternatives. Thus, the VFT method can be combined with other ordering methods such as AHP-Gaussian [De Carvalho et al. 2022], TOPSIS [Choudhary et al. 2021], PROMETHEE [Costa et al. 2022],

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SAPEVO-WASPAS [Vitorino et al. 2023] and MACBETH [Abi-Zeid et al. 2024]. In addition, it can be implemented together with classification methods such as ELECTRE-Mor [Costa et al. 2021]. This combination ensures that decisions align with core values and objectives, promoting more informed and effective outcomes.

3. Methodology

The field research was conducted at EAOAR, located in the city of Rio de Janeiro-RJ, which plays a key role in improving career officers of all FAB staff. The unit studied is the process of selecting new instructors of the school, characterized by involving multiple stakeholders, from the Commander, the main decision maker of this process, to the current instructors, who act providing advice.

The target audience of the research was composed of all effective instructors of EAOAR, totaling a population of 20 instructors, among which 11 responded to an interview. The approach to this audience was carried out personally, requesting their participation in the research. All participants had their identity preserved, as established in the Informed Consent Form and in the Data Use Commitment Term, contained in the research project approved by the Research Ethics Committee of the Federal University of São Paulo, through the Report nº 5.171.765.

For data collection, interviews were conducted with internal stakeholders using a structured questionnaire composed of 29 questions. This questionnaire was designed to meet the specific objectives of this research. This methodological choice is based on the recommendations of Keeney [1992], who proposes a “Wish list” to conduct the structuring of the decision-making problem by the VFT Method.

In addition to the data collection with the participants, documentary research was carried out. This work consisted of a search for institutional documents available on the BAF website to better understand SISTENS. As highlighted by Gil [2021], "the main value of documentary analysis in qualitative research is therefore to enable methodological triangulation, which refers to the use of multiple methods to obtain data as complete and detailed as possible".

After data collection, the results of the interviews were transcribed to build a textual *corpus* for analysis with the software *Interface de R pour les Analyses Multidimensionnelles de Textes et de Questionnaires* (IRAMUTEQ), developed by Ratinaud [2014]. This technique was chosen because IRAMUTEQ is a free open-source software, "used in the study of Humanities and Social Sciences [...] to perform statistical analysis of texts" [Salviati 2017].

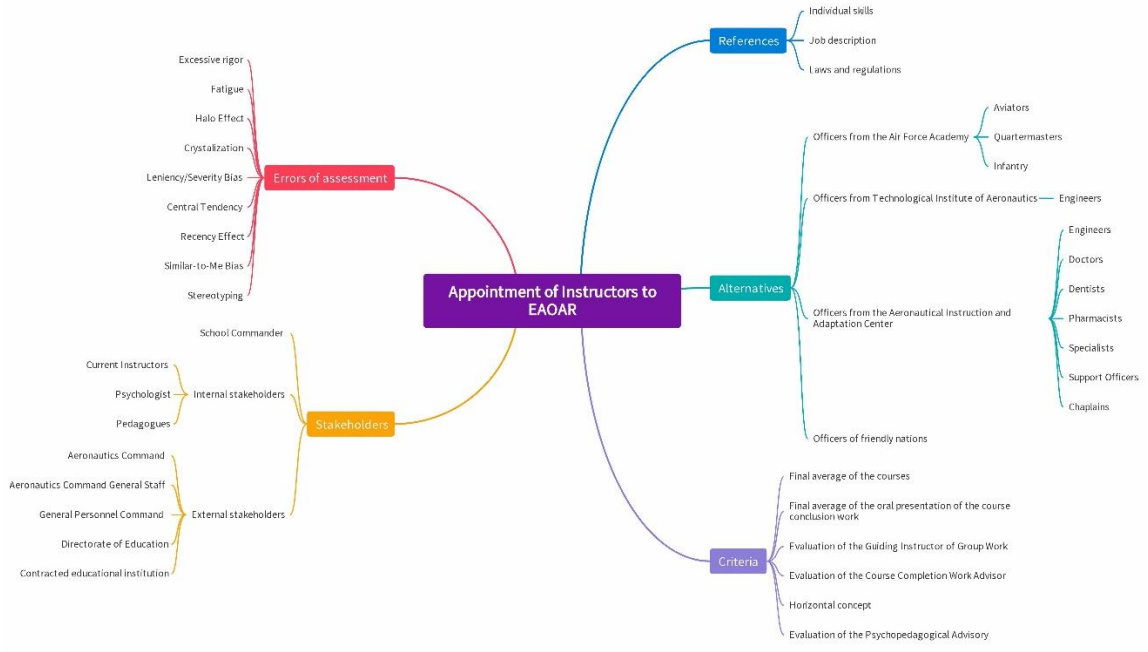
During this study, the researcher faced some difficulties, such as scheduling interviews with internal stakeholders, as well as semantic doubts regarding the questions, which required adaptations in the methodological approach. On the other hand, the facilities included participant observation of the researcher and the organizational interest in better understanding the decision-making process studied, which contributed to the effective conduct of the research.

4. Results and discussions

As suggested by Buzan and Abbott [2006], the mental map in Figure 1 was developed, where the boundary conditions of this decision problem are inserted. The Brazilian Student Officers of EAOAR are graduates of the Air Force Academy (AFA), the Aeronautics Institute of Technology (ITA), or the Aeronautical Instruction and Adaptation Center (CIAAR). It is also possible to verify the six criteria adopted, as well as the references, the internal and external stakeholders, and the evaluation errors that should be avoided.

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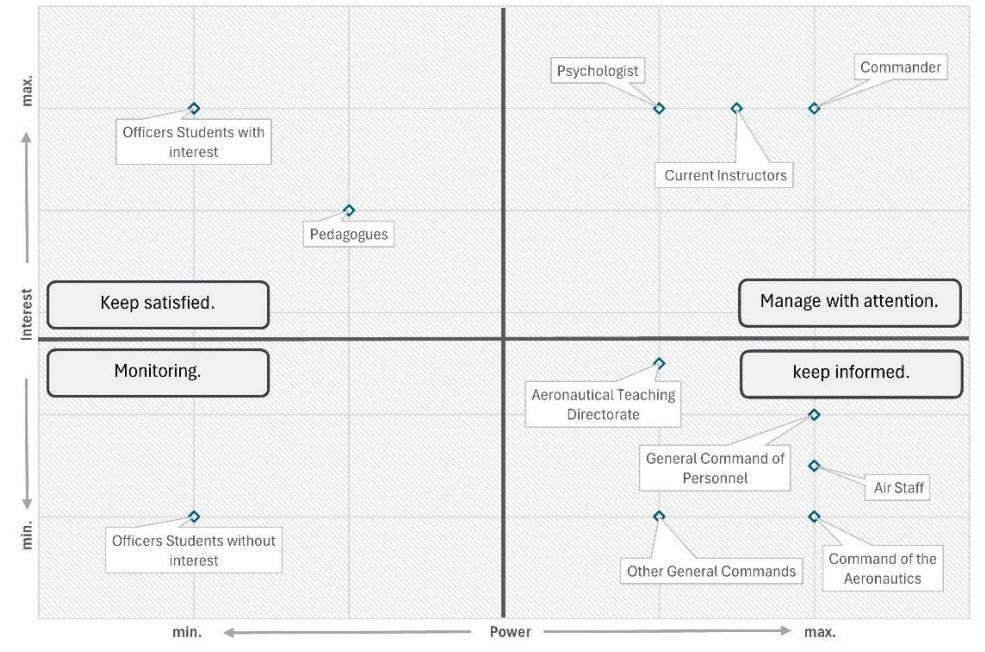
Figure 1 - Mental map of the problem of instructors selection from EAOAR.



Source: The Authors.

First, as suggested by Vieira *et al*. [2024], "the stages of mapping stakeholders, identifying the initial decision frame, and generating the decision statement" are carried out. Figure 2 provides a map that illustrates the stakeholder matrix, based on their power and influence in the process of appointing new EAOAR instructors, as recommended by Ackermann and Eden [2011].

Figure 2 – Power *vs.* Interest matrix.



Source: The Authors.

The regulatory stakeholders, with great power and low interest in this decision-making process were analyzed through their current rules. For simplification and regulatory constraints,

DOI: 10.59254/sbpo-2024-193644
https://proceedings.science/p/193644?lang=pt-br

stakeholders with low power and low interest, who correspond to friendly nation officials, were not considered in this research.

For De Almeida [2013], it is important to note that, as part of the initial stage of the decision process, the identification of the decision maker and internal stakeholders was carried out to establish a solid basis for the structuring of the decision-making problem. In this context, the documents related to teaching at EAOAR were thoroughly analyzed, as well as the relevant laws and regulations that affect this decision-making process.

In addition, eleven planned interviews were conducted, following a semi-structured approach, with the decision maker and ten other internal stakeholders. Each of these interviews had an average duration of fifty minutes, allowing a detailed and in-depth analysis of the problem.

In this context, the purpose of decision-making is “Appoint new instructors to maintain teaching excellence at EAOAR”, and its perspective is: "The decision must comply the EAOAR guidelines and the Officers' performance criteria at CAP". The initial decision frame for this case is shown in Table 1, as suggested by Vieira et al. [2024].

Regarding the scope of the decision, the alternatives should include only the Brazilian Student Officers, approved in the CAP and in the *lato sensu* graduate in Organizational Leadership. In addition, the deadline for this decision is set at the 12th week of each CAP, when the teaching staff meets with the Commander to carry out the indications of the new instructors. Although included in Figure 1, students from friendly nations, as well as Brazilians with low academic performance, are not part of this decision because they do not meet the legal requirements for their nominations to the role of EAOAR Instructors.

Table 1 – Indication of EAOAR Instructors.

Initial Decision Frame	
Purpose	Appoint new instructors to maintain teaching excellence at EAOAR.
Perspective	The decision must comply the EAOAR guidelines and the Officers' performance criteria at CAP.
Scope	✓ The alternatives should include only the Brazilian Student Officers, approved in the CAP and in the lato sensu graduate in Organizational Leadership. ✓ The deadline for this decision is set at the 12th week of each CAP, when the teaching staff meets with the Commander to carry out the indications of the new instructors. ✓ Out of scope: students from friendly nations, as well as Brazilians with poor academic performance, are not part of the scope of this decision.
Stakeholders' profile	✓ Commander of EAOAR: decision maker. ✓ Current Instructors: advise the Commander on the performance of Students Officers in class, group work and the preparation of course completion work. ✓ Psychologist: interested party that advises the Commander regarding the profissiographic profile of the Students Officers, to exercise the function of Instructor of EAOAR.

Source: The Authors, adapted from Vieira *et al.* [2024].

Defined these conditions, the values of the decision-making process were consolidated, from the following question asked to the eleven respondents: "what do you value, or what are the values, when you indicate an instructor for EAOAR"? The answers were transcribed and consolidated in the textual *corpus*. The analyses were made in an innovative way, through the software IRAMUTEQ [Ratinaud 2014].

Figure 3 shows an image with the result of the Correspondence Factor Analysis, which helps to visualize the proximity between the words evident in the respondents’ responses. In this

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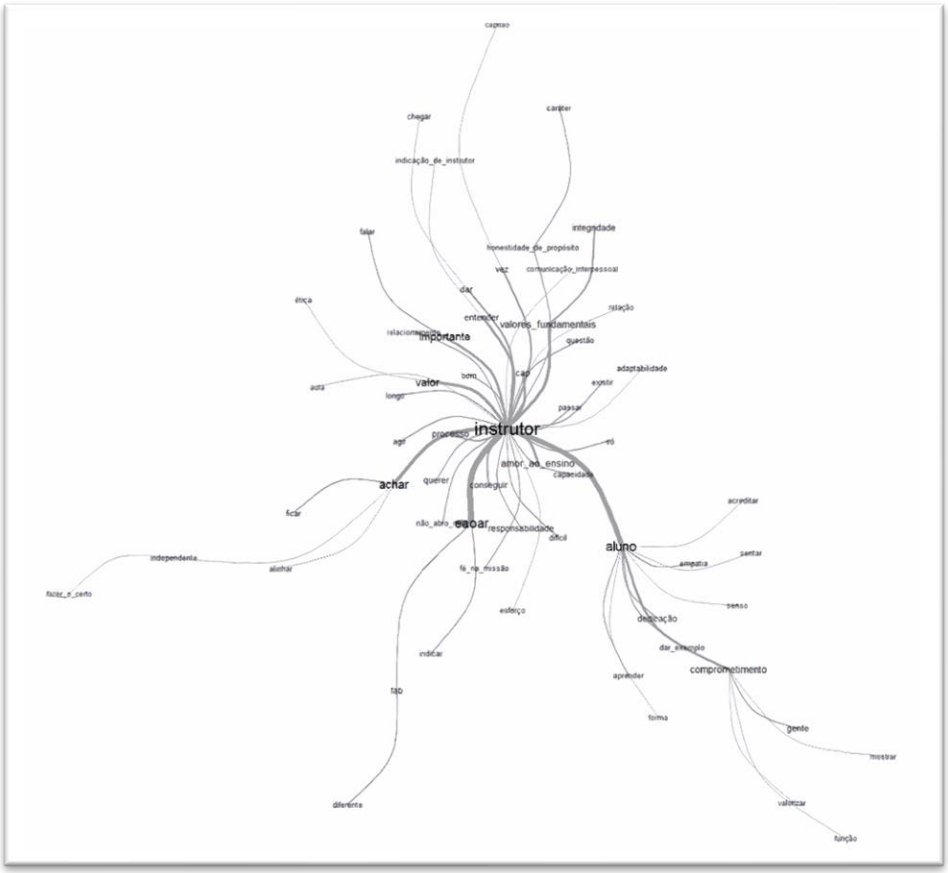
analysis, it was found that, in fact, the center of the decision problem is the EAOAR instructor, around which the values of the process are capillarized. It is observed that the “love of teaching” is the closest value to the instructor, very correlated with the “responsibility”, very closely accompanied by the “adaptability”.

In the field more related to the student, the values of "empathy" and "commitment" are evident, very interconnected with "dedication" and "setting an example". The EAOAR appears institutionally related to the BAF itself and, in this branch, the value of “faith in the mission" stands out. In the branch related to the process itself, its correlation with "doing right" became evident.

The important values of "ethics", "relationship" and "interpersonal communication" were also directly correlated with the instructor. However, they stand out as fundamental values, the "character", the "honesty of purpose" and the "integrity". Thus, it was possible to inventory the values underlying the process of appointment of new instructors EAOAR.

These values more clearly identify the fundamental objectives and means of this decision-making process. The analyst and stakeholders adjusted the objectives to confirm that they fit into the initial decision framework. After the “Control of Consequences” suggested by Keeney [1992], the analyst elicited the means-ends objectives network.

Figure 3 – Correspondence Factor Analysis.

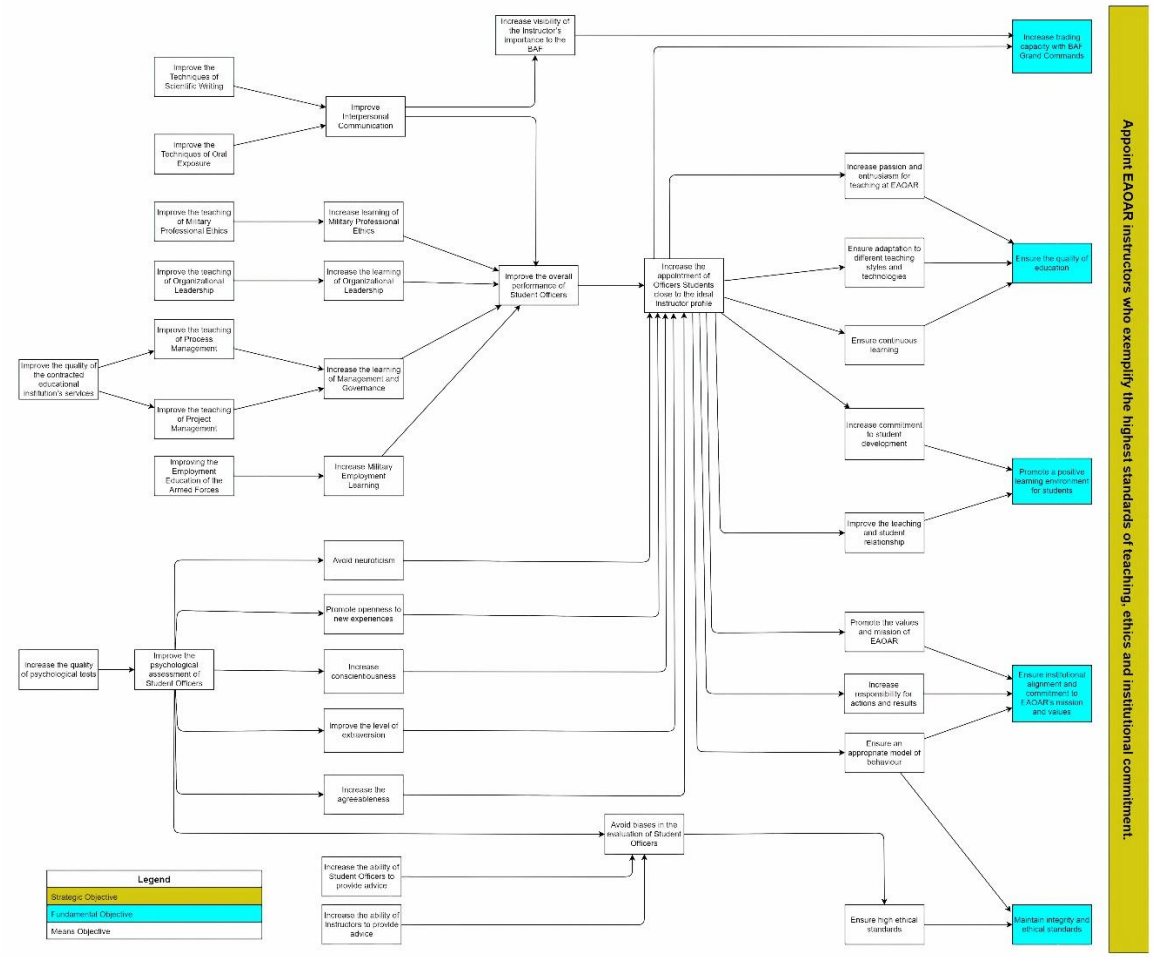


Source: The Authors.

As suggested by Keeney [1992], the objectives network of Figure 4 was elaborated, considering the understanding of the boundary conditions of the decision-making problem, visible in Figure 1 [Buzan and Abbott 2006]; the matrix of interest and power of stakeholders, presented in Figure 2 [Ackermann and Eden 2011]; and the values identified in the semi-structured interview, using the IRAMUTEC software [Ratinaud 2014].

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Figure 4 - Means-ends objective network.



Source: The Authors.

This network of objectives is useful in defining the attributes crucial to the appointment of new EAOAR instructors. The institutional values underlie the fundamental objectives of the decision-making process. Briefly, these values were consolidated in (1) integrity guided by ethics, honesty, and uprightness of character; (2) respect for people, rules, and regulations in force; (3) constant improvement; (4) team spirit; and (5) love of teaching.

This research identified and hierarchized the criteria, or guiding principles of the decision-making process, as Keeney [1996] explains. Six benefit or profit criteria were identified, that is, attributes to be maximized, as shown in the Table2. Final average obtained in the course (C1), Grade for the oral presentation of the course completion work (C2), and Advisor's subjective assessment of the course completion work (C4) are related to the fundamental objective **ensure the quality of education**, as future instructors must demonstrate extensive knowledge of the content taught in CAP and strong communication skills. Additionally, criteria C1 and C2 also contribute to achieving the objective **increasing trading capacity with BAF Grand Commands**, as they help to enhance the **visibility of the instructor's importance for the BAF**. The subjective evaluation of the Instructor Supervisor of Group Work (C3) and Horizontal concept (C5) are aligned with the objective **promote a positive learning environment for students**. Criteria C3 and C5, along with the Evaluation carried out by the School's Psychopedagogical Advisory (C6), also contribute to achieving the objectives **ensure institutional alignment and commitment to EAOAR's mission and values** and **maintain integrity and ethical standards**. Ultimately,

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improving the process of nominating new instructors itself contributes to **increasing trading capacity with BAF Grand Commands**.

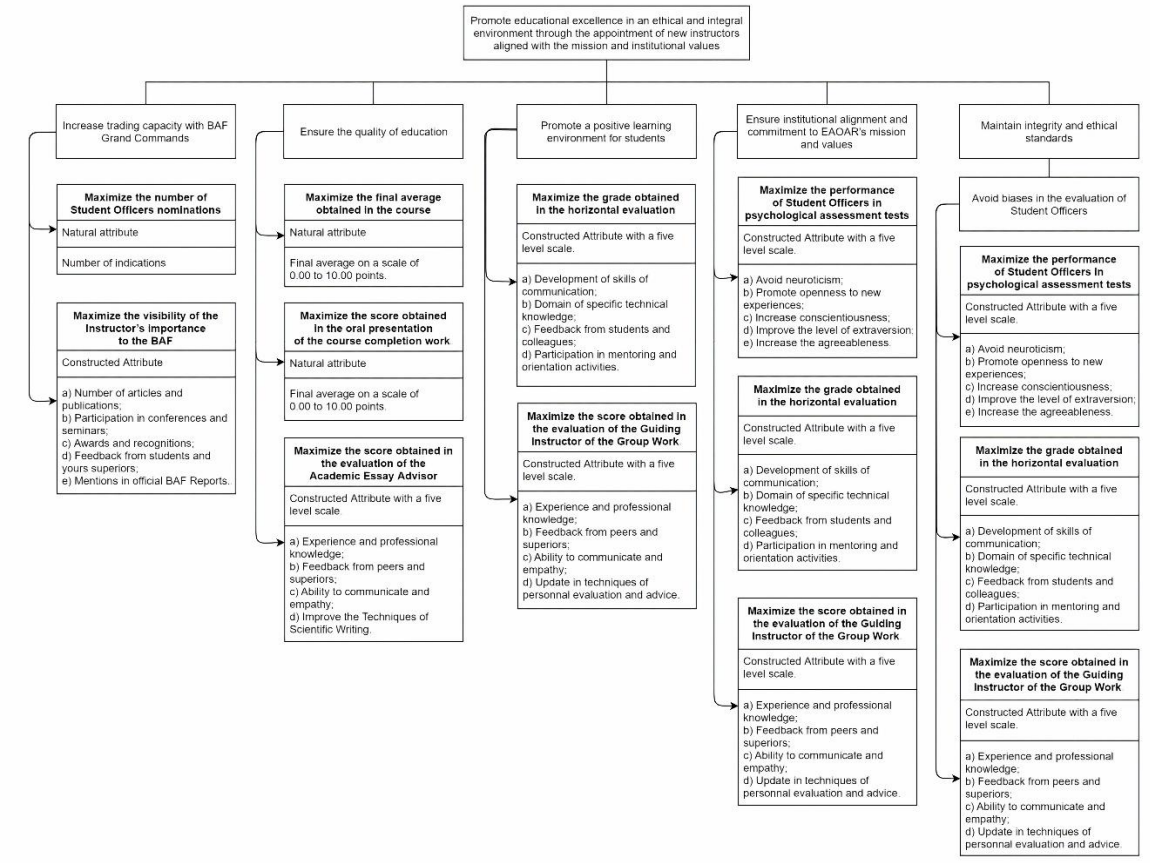
Table 2 - Criteria for nominating Instructors.

Criteria	Description	Goal
C_1	Final average obtained in the course, ranging from 0.000 to10.000.	Maximize
C_2	Grade for the oral presentation of the course completion work, ranging from 0.000 to 10.000.	Maximize
C_3	Subjective evaluation of the Instructor Supervisor of Group Work, expressed in a five-level verbal scale.	Maximize
C_4	Advisor's subjective assessment of the course completion work, expressed in a five-level verbal scale.	Maximize
C_5	Horizontal concept, in which each student evaluates his peers in the class, expressed in a five-level verbal scale. The performance in this criterion is measured by the sum of the evaluations received.	Maximize
C_6	Evaluation carried out by the School's Psychopedagogical Advisory, expressed in a five-level verbal scale.	Maximize

Source: The Authors.

Thus, it was possible to create the hierarchy of fundamental objectives presented in Figure 5, as well as their respective attributes.

Figure 5 - Hierarchy of fundamental objectives.



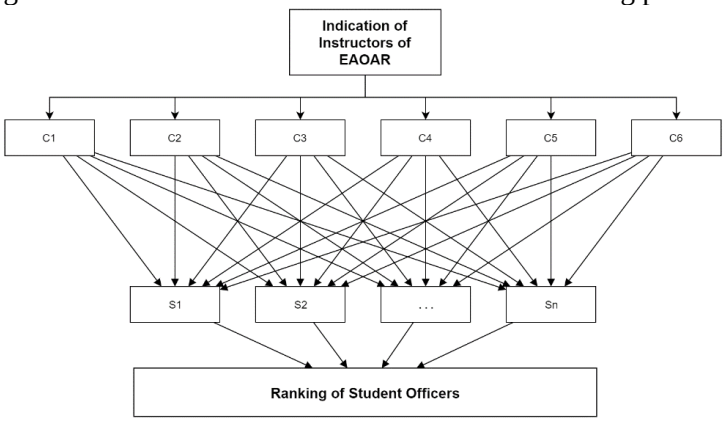
Source: The Authors.

In addition, it was identified that the problem of decision-making is, first, ordering (P. γ) and, in a second moment, classification (P. β) between indicated and not indicated to the function

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of instructor of EAOAR [Roy 2013]. The structure of the EAOAR instructors' appointment decision problem is presented in Figure 6.

Figure 6 - Hierarchical structure of the decision-making problem.



Source: The Authors.

In this context, it was found that the object of study of this research is a problem decision-making, whose action space was defined by the stable and discrete set of alternatives $S = \{S_1, S_2, S_3, \cdots, S_n\}$, of the candidate students to the EAOAR instructor. There is no initial definition of several referrals in each CAP class; however, the alternatives need to be ranked from the best to the worst overall student performance to reduce decision-maker biases in the process.

As Marttunen [2019] suggests, this structuring is fundamental for multicriteria decision analysis. In this sense, after clarifying the characteristics of the decision-making process studied, this research complements the work of Da Silva et al. [2024], and it is possible to propose a hybrid approach of ordering alternatives, with the VFT and AHP-Gaussian [De Carvalho et al. 2022]; or TOPSIS [Choudhary et al. 2021]; or PROMETHEE [Costa et al. 2022]; or SAPEVO and WASPAS [Vitorino et al. 2023]; or MACBETH [Abi-Zeid et al. 2024] methods.

Another proposal would be the hybrid implementation of the VFT and ELECTRE-Mor [Costa et al. 2021] methods, if the indication of EAOAR instructors also assumes a classification problem, as there is the class of those indicated and those not indicated to instructor. However, this hybrid implementation requires another complementary research to this work, given the complexity of the necessary calculations, in a quantitative approach.

5. Conclusions

This study aimed to evaluate the impact of the VFT method on the decision-making process for appointing new EAOAR instructors. Initially, detailed interviews with eleven key stakeholders helped identify the values underlying the instructor appointment process. Using IRAMUTEQ software, the stakeholders' preferences were aggregated to reveal the fundamental values and guiding principles.

Based on these insights, the study identified the core objectives of the instructor selection process, clarifying the essential goals. Consequently, six crucial decision-making criteria for evaluating candidates were defined. These criteria stemmed from stakeholder responses and their relevance to the decision-making process.

After establishing the decision-making criteria, available alternatives for instructor selection were identified. However, a more detailed study and ranking of these alternatives are necessary, as this research focuses on structuring the decision-making problem rather than solving a specific case, which requires a quantitative approach.

The study proposed a hybrid approach that combines VFT with other ranking and classification methods to evaluate alternatives effectively, considering the identified values and objectives. The field and documentary research highlighted the complexity of the selection process,

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influenced by multiple stakeholders with varying levels of power and interest. The identified values and established criteria are crucial for candidate evaluation.

The next step involves implementing the proposed hybrid approach, necessitating further analysis and quantitative research to ensure an informed and fair decision in selecting new EAOAR instructors. These findings represent a significant advance in structuring the decision-making problem, aiming to enhance the selection process's quality by aligning it with the institution's fundamental values.

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