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QUALITY MANAGEMENT FOR AGROINDUSTRIAL WORKSHOPS BASED ON THE EFQM MODEL AT ESPAM MFL

GESTIÓN DE LA CALIDAD PARA TALLERES AGROINDUSTRIALES BASADO EN EL MODELO EFQM EN ESPAM MFL

GESTÃO DA QUALIDADE PARA OFICINAS AGROINDUSTRIAIS BA-SEADAS NO MODELO EFQM NA ESPAM MFL

Diana Elizabeth Delgado-Mendoza[1*]; Benigno Javier Alcívar-Martínez[1]; Celi María Carranza-Loor[1]

diana.delgado@espam.edu.ec; balcivar@espam.edu.ec; celi.carranza@espam.edu.ec

[1]ESPAM MFL, Calceta, Ecuador

***Correspondence:** Benigno Javier Alcívar-Martínez **Tel:** +594 099 054 7811 **Email:** balcivar@espam.edu.ec

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ABSTRACT

The objective of this research was to propose a quality management model for the agroindustrial workshops of ESPAM MFL, based on the system of excellence of the European Foundation for Quality Management (EFQM). The research approach is mixed, using inductive-deductive and analytical-synthetic methods, through in-depth interviews and surveys of the organization's internal customers. Management, planning, human talent, processes, clients, agreements and resources, and social impact. The model allows the assignment of scores and placement in levels that reflect the progress in quality management achieved by the organization. The proposal addresses the need to overcome the absence of methodologies, procedures and tools for quality management of products and services provided by the agroindustrial workshops of ESPAM MFL as a support for the implementation of improvement actions.

Keywords: quality management, agro-industrial workshops, EFQM.

RESUMEN

La presente investigación tuvo como objetivo proponer un modelo de gestión de la calidad para los talleres agroindustriales de la ESPAM MFL, basado en el sistema de excelencia de European Foundation for Quality Management (EFQM). El enfoque de la investigación aplicado fue mixto, se utilizaron métodos induc-ti-vo-deductivo y analítico-sintético mediante entrevistas a profundidad y encuestas a los clientes internos de la organización. Elección, talento humano, procesos, clientes, convenios y recursos y repercusión social. El modelo permitió la asignación de puntajes y la ubicación en niveles que reflejan el avance en materia de la gestión de la calidad alcanzado por la organización. La propuesta aborda la necesidad de superar la ausencia de metodologías, procedimientos y herramientas para la gestión de la calidad en los productos y servicios que brindan los talleres agroindustriales de la ESPAM MFL como soporte para la implementación de acciones de mejora.

Palabras clave: gestión de la calidad, talleres agroindustriales, EFQM.

RESUMO

O objetivo desta pesquisa foi propor um modelo de gestão da qualidade para as oficinas agroindustriais da ESPAM MFL, com base no sistema de excelência da European Foundation for Quality Management (EFQM). A abordagem da pesquisa é mista, utilizando os métodos indutivo-dedutivo e analítico-sintético, por meio de entrevistas em profundidade e pesquisas com os clientes internos da organização. Gestão, planejamento, talento humano, processos, clientes, acordos, recursos e impacto social. O modelo permite a atribuição de pontuações e a colocação em níveis que refletem o progresso na gestão da qualidade alcançado pela organização. A proposta aborda a necessidade de superar a ausência de metodologias, procedimentos e ferramentas para a gestão da qualidade dos produtos e serviços fornecidos pelas oficinas agroindustriais da ESPAM MFL como suporte para a implementação de ações de melhoria.

Palavras chaves: gestão da qualidade, oficinas agroindustriais, EFQM.

INTRODUCTION

Quality management is a fundamental aspect for the success and competitiveness of organizations today. One of the most recognized and widely used methodologies in this field is the EFQM Model (European Foundation for Quality Management). This model provides a management framework that helps organizations to improve their performance and to face the challenges of the environment. The objective of this research is to propose the application of the EFQM Model. To this end, a literature review has been conducted, including studies and proposals for implementing the model in various sectors, in different organizational contexts and countries.

(Martínez Clares, Pérez Cusó, & Martínez Juárez, 2017) mentions: The EFQM model is based on the idea that achieving customer and employee satisfaction, as well as social impact, requires leadership that drives organizational policy and strategy, human resources and operational processes towards the achievement of organizational excellence. It is based on nine criteria, each of which is divided into sub-criteria, that can be used to measure an organization's progress toward excellence. Leadership, 2.Policy and strategy, 3.Personnel, 4.Food and resources, 5.Processes; Results criteria (what the organization achieves)6. Customer outcomes, 7. People, 8. Society, 9.

In the study of (Abdullah, Hussein, & Mejbel, 2023), assessing the performance of people at the Central Bank of Iraq (CBI) using the EFQM Model, the authors explore the application of the EFQM model in the context of the Bank. Their findings shed light on the effectiveness of the EFQM model in improving performance and driving organizational excellence. On the other hand, (Amaya, Felix Poicon, Rojas Vargas, & Diaz Tito, 2020) conduct a study on quality management from its principles, including the analysis of the EFQM Model. In addition, (Díez et al., 2000) analyze the EFQM Model diagnostic questionnaire in a primary education center.

Since its inception, the EFQM Model has been used in a variety of organizations and contexts to assess and improve the quality of their processes and results. Research Investigation has highlighted the link between EFQM implementation and organizational performance improvement, both in business and in education and healthcare (Rodríguez et al., 2020; Santos & Abreu, 2019). The implementation of the EFQM Model has been studied not only in terms of its effectiveness, but also its adaptability to different contexts and alignment with contemporary quality management approaches, such as the Quality 4.0 idea (Nenadál, 2020). Quality management has been investigated. In conjunction with the EFQM Model, emphasizing the importance of leadership in the implementation and success of this management approach (González Rosas, Carrión García, Nava, & Palacios Marqués, 2015). In the field of quality management and sociocultural outreach in the university context, a variety of approaches and strategies have been explored by different researchers. (Paredes et al., 2019) examined the relationship between quality management and university outreach, highlighting its importance.

"The evaluation of quality management at ULA allowed us to identify areas for improvement in which we must work to achieve a higher level of excellence." (González, Maldonado, Nava, & Ramírez 2013, p. 318) To do so, they applied the EFQM model and found that the faculty presented a medium level of excellence, with strengths in the areas of leadership and strategy, and areas for improvement in the areas of people, processes and results. On the other hand, (Henriquez & Henriquez, 2019) proposed the implementation of the EFQM model at the University of Guayaquil, based on the review of existing literature. Their research focuses on identifying best practices in quality management and how these can be applied in the university context, with the aim of improving educational quality and compliance with international standards.

On the other hand, (Revuelto-Taboada, Canet-Giner, & Balbastre-Benavent, 2011) focused on the EFQM experience and strategy formation in Spanish service companies in their article to Innovate. How quantitative research linked to the EFQM excellence model has been carried out has

also been studied. (Suárez, Calvo-Mora, Roldán, & Periáñez-Cristóbal, 2017) conducted a systematic review of the literature on this model in the journal European Research on Management and Business Economics. In addition, (Tarí Guilló, López Gamero, & Molina Azorín, 2007) explore the EFQM-based self-assessment process in a small and medium-sized company, as described in European Research on Management and Business Economics. (Juaneda Ayensa, González Menorca, & Marcuello Servós, 2013) analyzed cases of EFQM model implementation in social third sector organizations. Their results showed that the EFQM model can be an effective tool to improve quality management in these organizations.

The current proposal fits into this more recent trend of adopting quality management models based on the EFQM model. Through the proposal of a single management model for quality components, we seek to advance knowledge and improve quality in the higher education sector. In this sense, it is hoped that this research will be a significant contribution to the academic and educational community as well as to those in charge of managing quality in educational institutions.

MATERIALS AND METHODS

This research has a mixed descriptive, field and documentary approach, using deductive, inductive, analytical and synthetic methods to identify the most important criteria for the internal customer of the agroindustrial workshops of ESPAM MFL. According to (Parra, Villa,& Restrepo, 2009) the criteria and sub-criteria of the model are quantified to establish levels of quality management, which indicate the degree to which the specifications are satisfied or met. The research is descriptive and non-experimental, since it describes quality and its management, adapting the dimensions that compose it. It is also explanatory, since it reveals aspects of the components of the model with the support of documentary reviews of already tested models.

Likewise, this research is methodological as mentioned by (Díez et al., 2000), based on theoretical aspects of the components of the model of excellence by the European Foundation for Quality Management (EFQM) and the Plan, Do, Check and Act (PDCA) cycle or Deming Cycle. For the collection of information, two types of instruments were used for internal clients, such as the semi-structured in-depth interview and the survey. The population consisted of 34 people, including teachers from the agroindustrial engineering career and administrative personnel working in the agroindustrial workshops.

RESULTS

The coordination of workshops aimed at improving service quality was carried out in collaboration with the study's researchers. After evaluating different models, the EFQM Excellence Model was adopted, which focuses on three main elements: human talent, processes and results. This model is used to identify organizational strengths and weaknesses, and is based on self-assessment to undertake improvement actions and strengthen quality management.

The Excellence Model is based on the simplification of the structure of the original Excellence Model, with eight elements classified into actions and results, from which the selected criteria and sub-criteria are derived and adapted to the context of the organization. This model focuses on bringing together the most relevant functions for the management of the organization, promoting quality and its continuous improvement to ensure customer satisfaction.

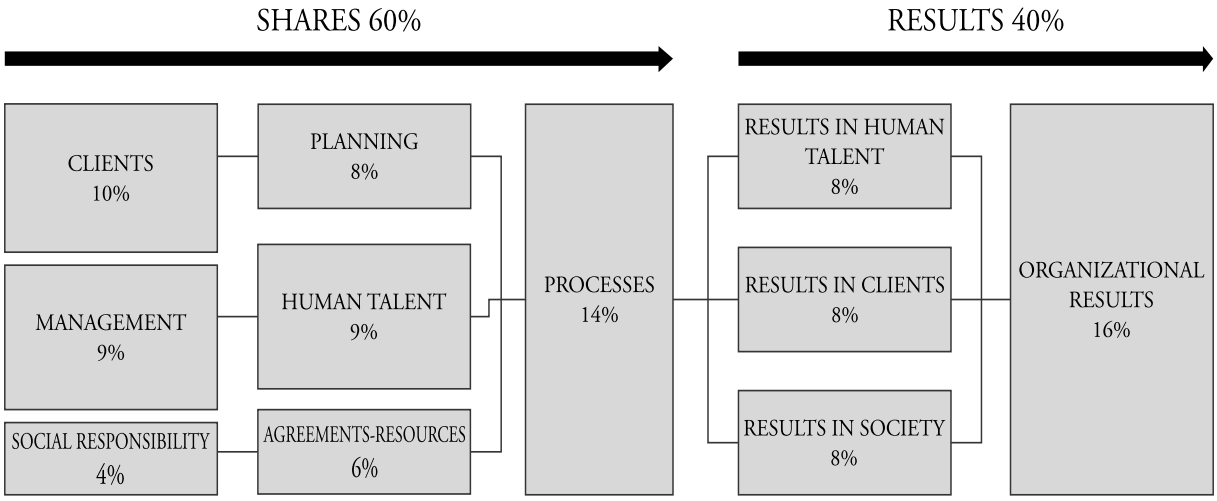
Process management is a key aspect in the Excellence Model, since it transforms inputs into outputs and facilitates the analysis and control of the activities carried out in them that influence the final result. Self-assessment at all times makes it possible to identify options for improvement in order to undertake actions for change, as well as good practices that should be maintained to strengthen quality management and facilitate continuous improvement.

The Excellence Model is based on three fundamental premises: management leadership, focus on results and continuous improvement. Leadership must establish and guide human talent in the fulfillment of strategic and quality objectives, encouraging their participation and recognition. The focus on results is based on achievement orientation through the application of the strategies designed, their constant evaluation and the communication of the results achieved. Continuous improvement implies the constant detection of opportunities to improve the work methodology and the final result, as well as an optimal use of resources to achieve efficiency and obtain a product free of defects.

The proposed Excellence Model consists of two areas: Actions and Results. The first area represents 60% and the second the remaining 40%. Both areas propose a structure by criteria, with a total of eight: Management Leadership, Strategic Planning, Human-Hand Talent, Customers, Process Management, Agreements and Resources, Social Impact and Integral Results.

Figure 1

Proposed Quality Management Model



Note. Own elaboration based on the questionnaire applied to the agro-industrial workshops of the ESPAM MFL.

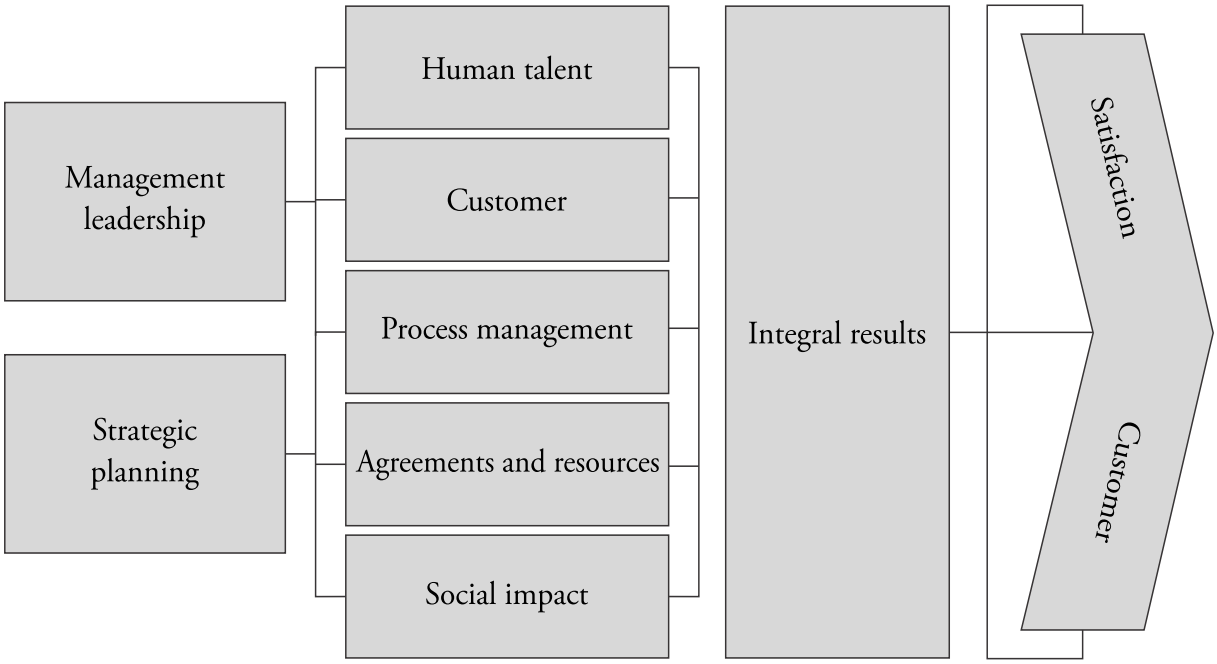
The Quality Management Model (QMM) is guided by a number of key principles. First, it is systemic and holistic, which means that it interprets the links between the organization's performance and internal and external expectations regarding quality. Secondly, it is preventive and seeks to avoid failures in quality management through self-assessment and the incorporation of the results into improvement planning. Thirdly, it promotes continuous improvement through the determination of improvement actions based on the results obtained from the self-assessment and the beginning of a new cycle with the implementation of these actions.

In addition, the MGC is flexible and potentially adaptable to other ESPAM MFL units that have similar or dissimilar activities to those of the workshops, provided that prior adaptation is made. Finally, the model is adaptable and can be modified in response to changes in the environment.

In terms of the structure of the model, the criteria are interrelated to achieve customer satisfaction through a management that plans and acts strategically, implementing values, policies and strategies on the operational side. This involves the management of human talent, clients, processes, agreements, resources and social impact, with the aim of obtaining the best possible results. Figure 2 illustrates this structure and relationship between the criteria of the model.

Figure 2

Structure of the Quality Management Model



Note. Own elaboration based on the proposal of the quality management model in the agro-industrial workshops of the ESPAM MFL.

Leadership and strategic planning are key factors that determine the performance and survival of an organization. To achieve total quality, it is necessary for managers to regularly review and update the policies and strategies contained in the plans, as well as to communicate them effectively to all members and ensure their proper implementation. This implies a comprehensive approach that encompasses human talent, clients, process management, agreements and resources, and social impact.

These criteria are interrelated and make up the management model. Human talent is guided by management guidelines and its performance is aligned with strategic planning. The information obtained from the study of customers and markets is essential to establish and maintain good relationships with them, which is reflected in properly managed processes oriented towards continuous improvement and sustainable use of resources. All this is done with a clear awareness of the impact that the organization's operations have on society.

In terms of comprehensive results, the focus is on customer satisfaction and customer knowledge. Human talent is evaluated, recognized, developed and motivated to achieve efficient management. Relations with suppliers and society are managed responsibly, and attention is paid to the quality of products and/or services, effectiveness and efficiency in processes, growth and productivity.

The management model is composed of eight criteria and eighteen sub-criteria, based on excellence models such as Deming, EFQM. It is important to mention that the terminology and orientation were adapted for the Agroindustrial Workshops, which do not compete commercially in the local market and operate as support units for academic management, research and university liaison. Although they do not have direct control or responsibility for the processes, the workshops are key to quality management. The weighting of the criteria and sub-criteria reflects their importance in the model, and was carried out by distributing 1000 points among them (see Table 1). The first criterion, Management Leadership, is divided into three sub-criteria of 30 points each: Management Organization, Motivation, Support and Recognition of Human Talent, and Commitment to Society. This criterion received 90 points in total.

Table 1

Weightings by criteria and sub-criteria

Criterion 1: Management Leadership			**90**
1.1	Management Organization	30	
1.2	Motivation, support and recognition of human talent	30	
1.3	Commitment to society	30	
Criterion 2: Strategic Planning			**80**
2.1	Strategic Treatment	40	
2.2	Strategic Development	40	
Criterion 3: Human Talent			**90**
3.1	Human Talent Management	30	
3.2	Development of Human Talent	30	
3.3	Quality in working life	30	
Criterion 4: Customers			**100**
4.1	Customer and market research	50	
4.2	Customer relationship management	50	
Criterion 5: Process Management			**140**
5.1	Process design and management	70	
5.2	Process improvement management	70	
Criterion 6: Agreements and Resources			**60**
6.1	Management of external alliances	15	
6.2	Management of financial and information resources	15	
6.3	Technology management	15	
6.4	Physical, material and intellectual resources management	15	
Criterion 7: Social impact			**40**
7.1	Image of the organization in society	20	
7.2	Promotion of quality culture	20	
Criterion 8: Comprehensive Results			**400**
8.1	Customer focused results	80	
8.2	Results focused on human talent	80	
8.3	Results focused on society and suppliers	80	
8.4	Results focused on the organization	160	

Note. Tables 1, 2, 3, 4 and 5 show the results of the quality management model proposed for the agroindustrial workshops of ESPAM MFL.

The second criterion, Strategic Planning, awards a total of 80 points, which are distributed in two sub-criteria: Strategic Treatment and Strategic Development, with a value of 40 points each.

The third criterion, Human Resources, is divided into three sub-criteria: Human Resources Management, Human Resources Development and Quality of Working Life. In total, this criterion awards 90 points, with an equal distribution of 30 points for each sub-criterion.

The fourth criterion, Customers, represents a total of 100 points, divided into two sub-criteria: Customer and Market Research, and Customer Relationship Management, each worth 50 points.

The fifth criterion, Process Management, is the highest scoring criterion in the model with a

total of 140 points. This criterion is divided into two sub-criteria with a value of 70 points each: Process Design and Management and Process Improvement Management.

The sixth criterion, Agreements and Resources, is divided into four equal sub-criteria, each with a value of 15 points: Management of external partnerships, Management of financial and information resources, Management of technology, and Management of physical, material and intellectual resources.

The seventh criterion, Social Impact, represents one of the least representative scores within the model with a total of 40 points. This criterion is divided into two sub-criteria of 20 points each: Image of the organization in the eyes of society and Promotion of the culture of quality.

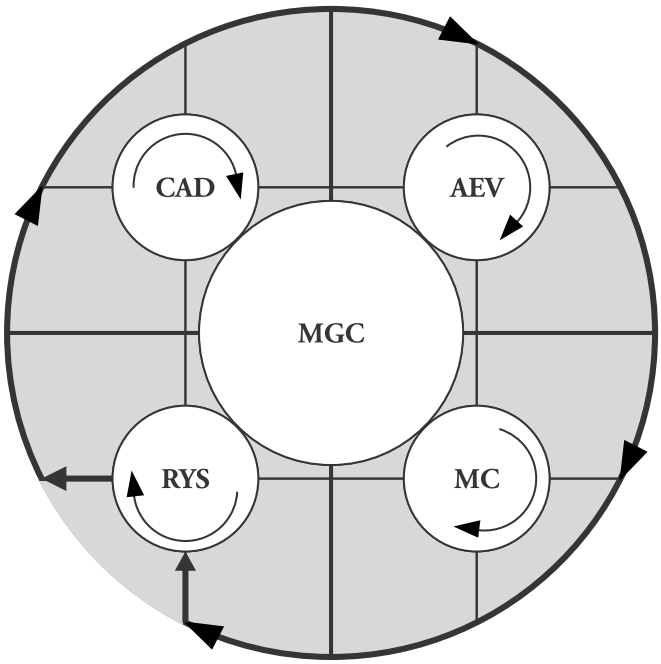
The eighth and last criterion, Integral Results, is the most important of the model and represents 40% of the total score. This criterion is divided into four sub-criteria: Results focused on the client, Results focused on human talent, Results focused on society and suppliers, and Results focused on the organization. The first three sub-criteria score 80 points each, while the last sub-criterion scores 160 points.

Operationalization of the model

The methodology that operationalizes the application of the proposed model consists of four phases (Figure 3), starting with the adoption of the commitment by senior management and culminating with the review, feedback of the results and follow-up of the planned improvement actions, which is evidently a cyclical exercise whose objective is quality management with a view to continuous improvement in order to achieve excellence.

Figure 3

Phases of the Quality Management Model



The phases of the Quality Management Model are described below:

PHASE I. Senior Management Commitment (SMC):

The commitment of the organization's top management is essential to incorporate quality in the management of the organization. This commitment ensures the implementation of quality and the allocation of the necessary resources to maintain and improve it. Commitment implies understanding how the model works and recognizing that it is a tool, not an end in itself. In addition, it is important to make correct use of the model in quality management.

PHASE II. Self-evaluation (AEV):

The self-assessment is based on an instrument containing statements or questions that allow to evaluate the degree of development of quality management in the organization through the assignment of ratings. This activity must be planned and the following tasks must be carried out: Formation of the evaluation team, composed of people with solid knowledge in quality and in the content of the model.

- Selection of the areas to be evaluated and the source of information.
- Structuring of the self-evaluation form.
- Notification of the meeting date and completion of the self-assessment questionnaire.

Performing the calculations to obtain the average scores for each item, as well as the value of the sub-criterion and criterion. The ratings are then transformed into scores and the organization is placed on the three-level scale established for this model (Table 2). Drafting of a report summarizing the results of the self-assessment that can be used in decision-making at the management level in the next phase.

Table 2

Quality management levels

Score	State
$0 \geq x \leq 400$	Initial
$401 \geq x \leq 600$	In Development
$601 \geq x \leq 900$	Developed
$901 \geq x \leq 1000$	Excellent

PHASE III. Continuous Improvement (CI)

To carry out the continuous improvement process, three steps must be followed: first, it is necessary to formulate projects focused on improving the organization's performance in those criteria that obtained low scores. Secondly, the change is implemented, which can be evaluated after a short period of time or wait until the next evaluation.

PHASE IV. Feedback and Follow-up (RYS)

Once the improvement reaches maturity and provides reliable information, the results of the self-assessment and the implementation of changes are communicated throughout the organization, a process known as feedback. Its purpose is to involve human talent in management and to acquire experience in solving problems, which in a certain way, although not detected in a specific area, may exist or arise in another, generating a proactive spirit in adapting improvement options to the organization's management.

Monitoring is performed periodically and is specific to the changes implemented. It is divided into two types: tactical, when its scope is limited to changes resulting from improvement projects, and strategic, when it is a new self-assessment to check the consistency of the model globally once the changes have been adopted, as the actions have an impact on results.

Self-Assessment Results

The self-assessment uses an instrument containing questions or statements that reveal the degree of development of quality management in the organization. The evaluation of the criteria and their sub-criteria (Table 3) represents the average value of the scores assigned to each of the questions posed in the self-assessment questionnaire. The values assigned are based on a distribution of scores that shows whether the aspect is well-founded, is assumed by the organization

in a systemic or preventive manner, and is subject to review, integration and implementation. The total valuation of the criterion (TCV) is obtained by calculating the average of the value of the sub-criterion(s).

Table 3

Summary of results criteria 1 to 7

Criterion	C1	VT	C2	VT	C3	VT	C4	VT	C5	VT	C6	VT	C7	VT
Subcriterion	1.1	53	1.1	70	1.1	51	1.1	53	1.1	57	1.1	60	1.1	70
Subcriterion	1.2	66	1.2	78	1.2	66	1.2	23	1.2	57	1.2	92	1.2	77
Subcriterion	1.3	37			1.3	78					1.3	75		
Subcriterion											1.4	79		
Summation		155		148		195		75		114		245		147
Total Rating Criterion		52		74		65		38		57		76		73

In the case of criterion 8 (Table 4), this requires an additional calculation because the weights of the results are distributed in such a way that they complement and do not overestimate the action criteria (customer, human talent, impact on society).

Table 4

Summary of results criterion 8

Criterion	C8	VT	Peso	VP
Subcriterion	1.1	25	0,2	5
Subcriterion	1.2	25	0,2	5
Subcriterion	1.3	75	0,2	15
Subcriterion	1.4	83	0,4	33
Summation		208	1	58
Total Rating Criterion		52	VTCP	58

The results of the self-assessment by criterion are presented below (Table 5). In CRITERION 1, 47 out of a possible 90 points were obtained, which indicates that Management Leadership is at 52% of the expected development. In CRITERION 2, 59 out of 80 points were obtained, which shows that Strategic Planning is 74% effective. In CRITERION 3, 59 out of 90 points were obtained, suggesting that Human Talent management is 65% advanced. CRITERION 4 scored 38 points out of a possible 100, which indicates that the focus on Customers is underdeveloped (38%). In CRITERION 5, 80 points out of 140 were obtained, which shows that Process Management is 57% advanced. CRITERION 6 scored 46 points out of 60, which shows that 76% of the Agreements and Resources are being used for the benefit of quality management. In CRITERION 7, 29 out of 40 points were scored, suggesting that the expected Social Impact is 73%. Finally, in CRITERION 8, 233 out of 400 points were received, showing that the organization's Results reflect 58% of what was planned. In the context of management self-assessment in an educational institution, a score of 590 points can indicate that the institution is at a developing level in terms of its quality management.

Table 5
Result of self-assessment

N	Criterion	VTC	Factor	Final Value
1	Criterion 1: Management Leadership	52	0,9	47
2	Criterion 2: Strategic Planning	74	0,8	59
3	Criterion 3: Human Resources	65	0,9	59
4	Criterion 4: Customers	38	1	38
5	Criterion 5: Process Management	57	1,4	80
6	Criterion 6: Agreements And Resources	76	0,6	46
7	Criterion 7: Social Impact	73	0,4	29
8	Criterion 8: Comprehensive Income	58	4	233
Total Points Achieved				590

DISCUSSION

Research conducted by several authors in the field of quality management and the application of the EFQM (European Foundation for Quality Management) model has addressed various perspectives and approaches related to the assessment and improvement of excellence in different contexts. Some of the key contributions of these studies will be discussed below.

The findings of this study are in line with other research on quality management and the use of the EFQM model conducted by several authors in various fields. (Abdullah et al., 2023) explore how to assess employee performance in the Central Bank of Iraq. Using the Excellence Model. Although this context differs from the current study, its focus on measuring performance in relation to the EFQM model may provide revealing information that is useful for investigating agribusiness training programs at ESPAM MFL. (Amaya et al., 2020) The quality management principles presented can be used to establish a solid foundation for implementing the EFQM model and the continuous pursuit of excellence.

For Gonzalez Rosas et al. (2015), "leadership and competencies are fundamental to the successful implementation of the EFQM model". For example, a leader with effective communication skills can help ensure that all employees understand and follow quality procedures in an agro-industrial workshop. In addition, the competency-based leadership approach and EFQM can guide the way quality management is approached in agro-industrial workshops, which can improve the efficiency and effectiveness of production processes.

According to Henriquez and Henriquez (2019), their proposal for implementing the EFQM model at the University of Guayaquil "provides a valuable roadmap for adapting the model to an educational environment similar to that of ESPAM MFL," the proposal describes how key processes can be identified and performance indicators established to measure the success of the model's implementation. This information can be useful to inform practical decisions and approaches in the implementation of the model in agro-industrial workshops. According to Díez et al. (2000), their analysis focuses on the evaluation of the EFQM model diagnostic questionnaire. This approach can be useful for the design and adaptation of evaluation instruments for the ESPAM MFL agroindustrial workshops, as it allows a consistent and effective evaluation of quality processes and results. These can help identify the key questions that should be included in a diagnostic questionnaire to evaluate the implementation of the EFQM model in agroindustrial workshops.

Future research could include studies examining the effectiveness and results of the application of the EFQM model in various contexts, as well as the relationship between the EFQM model and other quality management models. In addition, the EFQM model can be applied in other sectors and countries to broaden its scope and contribute to the improvement of quality and excellence in other fields.

CONCLUSIONS

The quality management model for agro-industrial workshops focuses on quality criteria centered on the organization's internal customers. This does not detract from the importance of managing the processes in which each stakeholder plays a key role, whether in producing, receiving or influencing the quality of the organization.

The process approach establishes a logical order of input criteria or actions in this quality management model, such as running the organization according to plan and managing relationships with employees, customers, community and suppliers to obtain results that meet the needs of internal and external customers, including potential customers and those who are not directly involved but are indirect recipients of the actions of the agroindustrial workshops.

The proposed model allows self-evaluation within the agroindustrial workshop and consists of four phases that reflect the quality improvement cycle: Plan, Do, Check and Act. This cycle is widely used in quality management. The guide for the self-assessment of the workshops is characterized by being pragmatic and cyclical, involving the management, self-assessing, implementing changes, giving feedback and following up to start again in a spiral that promotes the continuous improvement of the organization.

ORCID

Diana Elizabeth Delgado-Mendoza: ESPAM MFL, Calceta, Ecuador.
Benigno Javier Alcívar-Martínez: ESPAM MFL, Calceta, Ecuador.
Celi María Carranza-Loor: ESPAM MFL, Calceta, Ecuador.

AUTHORS' CONTRIBUTION

Diana Elizabeth Delgado-Mendoza: Conceptualization, Data Curation, Analysis, Research.
Benigno Javier Alcívar-Martínez: Formal analysis, Drafting: original draft, Drafting: proofreading and editing.
Celi María Carranza-Loor: Software, Supervision, Visualization.

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CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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REVISION PROCESS

This study has been reviewed by external peers in double-blind modality.
Revisor A: **Nathalie Forero-Perdomo**, naforerope@unal.edu.co
Revisor B: A**nonym**.

RESPONSIBLE EDITOR

Pablo Calvo de Castro, pablocalvo@usal.es

DATA AVAILABILITY STATEMENT

The database of this research will be available to the scientific community upon request to the corresponding author.

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