Statistical Process Control and Quality Control' Tools regarding Measuring Organizations' Quality: The case of Ishikawa's approach in Greek tertiary education system evaluation in respect of quality assurance

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Abstract

The chief object of this paper is to study the dimension of Greek higher education quality with the help of Statistical Process Control and Quality Control' Tools named Fishbone (Ishikawa) Diagram. More spesifically, in the present study Fishbone (Ishikawa) Diagram very well known as Cause–and–Effect Diagram, tries to reveal the negative causes in Greek tertiary education system according to 202 Greek stundents' opinions. More specifically, it tries to identify the Likely Causes of Problems in the Greek educational system in relation to quality assurance. Possible solutions are proposed and implications for further research are made.

Keywords: Quality, assurance, secondary education, Ishikawa, EFQM, as Cause–and–Effect Diagram

1. Introduction

The goal of the present research paper is twofold. At the beginning, the components/dimensions of the notion of quality, of the Total Quality Management (TQM) in Secondary education are determined and the Quality Model of the European Foundation of Quality Management (EFQM) is applied, as a tool of evaluation and also the Fishbone Diagram , better known as Cause–and–Effect Diagram tries to reveal the negative causes in Greek education system according to 202 Greek students' opinions toward quality assurance in the Greek secondary education system.

2. Theoretical framework

In contemporary world high quality of products and services and its implication related to customer satisfaction is the key for the subsistence of whichever institution.

The concept of Total Quality Management (TQM) is many- faceted as it can act in every production process and stage (such as planning, production, distribution etc.) within the whole structure and every level of every business (administrative personnel, assistants, etc.) (Omachonu & Ross, 1994, Oakland, 1993) or of every financial or educational institution of the public or private sector.

TQM is a philosophy which positions customer's satisfaction in a central position, the commitment of the institution to this goal, the continuous improvement and innovation throughout the company or the institution (Khan., 2003, Tenner & DeToro, 1992) and it is required as well as the active participation of all the Human resources. Leadership, according to Hoogervorst et al. (2005) plays an important role in applying TQM- without the right leadership no change can be accomplished.

The last principle is the systematic and complete participation of all the parties involved in the operations of a business. As Logothetis argues (2005, p.37) "Everybody's involvement in a common pursuit of quality will ensure that all the interdependent procedures can function with the utmost ability with a view to total development".

Higher education institutions are looking for quality and excellence in education (Anastasiadis, 2020; Anastasiadis, et al., 2016; Anastasiadou & Zirinoglou, 2015a; Anastasiadou & Zirinoglou, 2015b; Anastasiadou 2015; Anastasiadou & Zirinolou, 2014a; Anastasiadou et al. 2016b; Anastasiadis, 2016; Taraza, & Anastasiadou, 2019a;. Anastasiadou, & Taraza, 2019a). Numerous researches have been made indicating the necessity regarding quality in education (Taraza & Anastasiadou, 2019a; Taraza & Anastasiadou, 2019b; Taraza & Anastasiadou, 2019c; Papadaki, & Anastasiadou, 2019; Papadaki & Anastasiadou, S. 2020; Anastasiadou & Zirinoglou, 2015b; Anastasiadou, 2018c; Anastasiadou & Anastasiadis, 2019; Anastasiadou & Taraza, 2019b; Anastasiadou & Taraza, 2019c; Anastasiadou et al., 2016b; Anastasiadou, & Taraza, 2020a; Anastasiadou, 2019 and Anastasiadou, & Taraza, 2020b) and for this it is necessary to study with the help of Statistical Process Control (SPC) through the aforementioned statistical tools and charts among which is the Cause–and–Effect Diagram or Fishbone (Ishikawa) Diagram (Atilgan & McCullen, 2011).

According to Vekemans (1991) it is "a valuable tool" that represents and analyzes the causes or factors responsible for causing an effect (Ishikawa, 1985; Vekemans, 1991; Tummala & Tang, 1996; Enarsson, 1998). The Cause–and–Effect Diagram or

Fishbone (Ishikawa) Diagram shows all the factors or causes that affect each category separately and that cause an undesirable result or damage or problem.

The Cause–and–Effect Diagram or Fishbone (Ishikawa) Diagram is a very useful tool for analyzing real situations, minimizing problems, training executives on decision-making techniques and corrective actions, or establishing existing procedures (Papargiris & Papargiris, 2010). During its implementation, the problem is first identified and recognized as the negative result that requires decisions to eliminate it so that it does not recur. The following is the identification of the factors that are responsible for linking the causes to the outcome. According to Ishikawa (Ishikawa, 1985) the causes are too many and for this reason they are classified into six different categories such as Equipment, Methods or Processes, Human Resources (People), Materials, Environment (Environment) and Management. The above are techniques to solve quality problems in a systematic way (Krüger, 2001).

The Cause–and–Effect Diagram or Fishbone (Ishikawa) Diagram helps better process planning and helps identify cost-effective solutions to problems (Antony & Taner, 2003, Dotchin & Oakland, 1994, Garvin, 1988, Grigg & Walls, 2007).

It is an indisputable fact that the Cause–and–Effect Diagram or Fishbone (Ishikawa) Diagram has been used by many companies and researchers (Vassilakis & Besseris, 2009; Vassilakis & Besseris, 2010, Hariharan & Dey, 2010; Enarsson 1998).

3. Sample

The demographic profiles includes the following characteristics of the despondences; gender, age and year of education. The demographic profiles shown in Table 1 is based on frequency and relative frequency distributions.

The sample comprised of 202 interviewees from the department of Business administration in the University of Western Macedonia, of whom 127 (62.9%) were men and 75 (37.1%) were women. With respect to the ages of participants, 138 (68.3%) of them were 18 years old, 28 (13.9%) of them were 19 years old, 9 (4.5%) of them were 20 years old and, finally, 28 (13.4%) were 21 years or more. With respect to their year of studies, 138 (68.3%) of them were during their first year of their studies, 28 (13.9%) of them were during the second year, 9 (4.5%) of them were during the third year 16 (7.9%) of them were during the fourth year and 11 (5.4%) of them were during the fifth year and above (Table 1).

Table 1: Demographic data of the sample (N = 202)

Variables	Classes	N=202	%
Gender	Male	127	62.9
	Female	75	37.1
Age	18 years	138	68.3
	19 years	28	13.9
	20 years	9	4.5
	21 years or more	28	13.4
Year of Studies	First year	138	68.3
	Second year	28	13.9
	Third year	9	4.5
	Fourth year	16	7.9
	Fifth year and above	11	5.4

4. The instrument

The European Quality Award (EFQM model) is a widely known model which an institution can apply to implement the principles of Total Quality Management (TQM) in order to achieve excellence. In the present study the criteria of EFQM model, based on international bibliography, and are recorded. Then recorded and analyzed the students' views in the light of these criteria reveal the dimensions of Greek educational reality. Afterwards, the causes for the low performance of the educational process were discussed and ways to contribute to Constant Improvement were proposed.

European Foundation for Quality Management- EFQM: Following the positive effect of the application of quality models and the impressive performance of businesses in Japan (with Deming Award) and in the USA (with Malcolm Baldrige National Quality Award), the European Union, in order to ensure equal success, established the European Foundation for Quality Management (EFQM).

The EFQM quality model in question can be applied for different purposes, since it can be an evaluation tool, a way of comparing it to other companies, a structure for the administration, a guide of detecting those points that need improvement and a basis for developing a common way of thinking (Kouzmin et al., 1999).

In addition, the particular model is very well received by educational institutions, so as they can be evaluated and their strong and weak points can be detected (Calvo-Mora et al., 2006).

The first five criteria – "conditions" (enablers) (the leadership, the policies and the strategy, the Human Resources, the collaborations – resources and the procedures) are the basic factors that the company/organization must put into practice, so that it raises its performance (McAdam & Bannister, 2001) and it ends up in the other four criteria, which are the "results" (the results of customers, Human Resources, society and company/ institution). In greater detail, the "requirements" deal with the ways and means, which are used or will be used by the company, in order for the foundations to be laid and their function to be empowered. The criteria of the model give a precise and reliable analysis, controlling thus whether the institution manages effectively and efficiently the resources available and finally, if it displays continual improvement. Since the company has determined its mission and goals, the rest 4 criteria –"results", control the consequences from the measures taken, monitor the performance and evaluate the degree of achievement of the strategic targets. In short, the "results" derive from the "requirements", while at the same time with their feedback "requirements» too are improved.

The reliability of the instrument was related to items 1 to 46 was estimated by Cronbach alpha coefficient (*a*) (Croanbach, 1984). The value of Cronbach's α coefficient for this instrument was equal to 0.816 and it is a very high value in terms of internal consistency (Alevriadou et al., 2014; Anastasiadis, 2020; Anastasiadis & Christoforidis, 2019; Anastasiadis et al., 2016; Anastasiadou, 2007; Anastasiadou, 2008; Anastasiadou, 2009; Anastasiadou et al., 2010b; Anastasiadou, 2011; Anastasiadou, 2012; Anastasiadou, 2013a, Anastasiadou, 2013b; Anastasiadou, 2013c; Anastasiadou, 2018b; Anastasiadou, 2018c; Anastasiadou, 2018d; Anastasiadou, 2018e; Anastasiadou, 2019a; Anastasiadou 209b; Anastasiadou & Anastasiadis, 2011; Anastasiadou & Anastasiadis, 2019; Anastasiadou et al., 2016; Anastasiadou & Karakos, 2011; Anastasiadou & Kofou, 2013a; Anastasiadou & Kofou, 2013b; Anastasiadou & Pappa, 2009; Anastasiadou & Pappa, 2019; Anastasiadou & Loukas, 2009; Anastasiadou & Taraza, 2019; Anastasiadou & Taraza, 2020a; Anastasiadou & Taraza, 2020b; Anastasiadou et al., 2014; Florou, et al., 2015; Kofou, & Anastasiadou, 2013; Souravlas & Anastasiadou, 2020; Souravlas et al., 2020; Thapa et al., 2016; Theodoridou, et al., 2014).

The Cronbach' alpha coefficient is calculated to measure the reliability of the five dimensions, i.e. Leadership, Policy and Strategy of the Institution, Human Resources Management Cooperation and Resources and Processes (Table 2). Cronbach' alpha coefficient verified the reliability of the instrument EFQM scale. In additions Cronbach' alpha coefficient was above the cutoff point of 0.70 for all the dimensions of EFQM (Table 2).

Table 2: Cronbach's Alpha

Dimensions	**Cronbach's Alpha**
Leadership	0.792
Policy and Strategy of the Institution	0.802
Human Resources Management	0.852
Cooperation and Resources	0.764
Processes	0.821
Total Scale	0.816

5. Data analysis

The research aims at constructing the cause and effect diagram (two levels) with the five criteria on which the EFQM scale is based, in order for the possible causes of the poor performance of Tertiary Education to be highlighted. Let's look first and in detail at each axis on which the answers of 202 students are distributed.

In particular, in the following paragraph, where the first factor of EFQM model, Leadership is examined, the extent to which Leadership develops systematically and perpetually the vision, values, mission and the culture, in general, of the institution aiming at cultivating and promoting the Culture of Excellence on the one hand and continuous improvement on the other.

The first group of items relating to leadership is the following and is presented in Table 3.

The social subjects of the specific research express a strong disagreement with the statements of the factor "Leadership". In particular, regarding the criterion "Leadership", the respondents do not have a specific view on whether the leader clearly communicates to other employees the goals, vision and values of the organization / school (M=3.30, sd=0.310) (HG1). According to the answers of the respondents it becomes obvious that for them it is not clear whether the leader improves / enhances

his/her actions, to meet current and future needs of the organization (HG2) (M = 2.96, sd=0.354) if he/she plans the organizational structure (not the structure of teaching or research) that matches the policy and strategy of the organization (HG3) (M=2.99, sd=0.251) and does not implement a system of key processes or support activities of the policy, strategy and purpose of the organization (HG4) (M= 2.31, sd=0.254). The respondents do not have a clear view of whether the leader is in contact with the various participants so that they know his/her expectations and opinions (HG5) (M=3.05, sd=0.229), if he/she encourages the participation of students and staff in improvement actions (HG6) (M=3.31, sd=0.168) and finally, if he/she publicly recognizes the achievements of individuals and teams in quality improvement activities (HG7)(M=2.96, sd=0.224).

Table 3: Leadership

Leadership	Mean	Std. Deviation	N
HG1. The Leader notifies the rest of the teaching staff of the goals, the vision and the values of the institution/ school.	3.30	0.310	202
HG2.The Leader improves/ reinforces his/her actions, so as to meet the present and future needs of the institution.	2.96	0.354	202
HG3. The Leader plans the organizational structure (not the teaching or research structure), which fits the policy and strategy of the institution.	2.99	0.251	202
HG4. The Leader applies a system of basic procedures or activities of reinforcement of the policy, the strategy and the purpose of the institution.	2.31	0.254	202
HG5.The Leader is in contact with the different participants in order to be aware of their expectations and views.	3.05	0.229	202
HG6. The Leader encourages the students' and teaching staff's participation in acts of improvement.	3.31	0.168	202

HG7.The Leader recognizes publicly the successful acts of individuals and teams towards improving quality	2.96	0.224	202

Next, the second factor of the EFQM model is investigated, which is the Policy and Strategy of the Institution. More specifically, the second factor consists of 10 questions, which deal with the Policy and Strategy of the Institution, are the following and are displayed in Table 4.

Table 4. Policy and Strategy of the Institution

Policy and Strategy of the Institution	Mean	Std. Deviation	N
PS1.The policy and strategy of the organization	3.19	0.345	202
PS2. The central policy and strategy of the institution are expressly recorded in writing	3.04	0.544	202
PS3. All the sections/ parts of the central policy of the organization participate in the procedure of forming and notifying its policy and strategy.	3.25	0.349	202
PS4. There is a formal procedure of the revision and readjustment of the policy and strategy of the institution.	2.03	0.394	202
PS5. The central policy and strategy of the institution is constructed following a strategic plan.	2.35	0.410	202
PS6. The targets of the central policy of the institution are defined in writing and following a clear quantifiable way.	2.49	0.243	202
PS7. The targets are communicated to all the levels of the organization.	3.02	0.255	202
PS8. The principles of quality have been integrated in all the policies and strategies and the goals of the institution.	2.29	0.411	202

PS9. There is a procedure, which allows the development of policies and strategies of the institution and their adjustment in a short-term frame.	2.38	0.403	202
PS10. The needs and expectations of the participants are taken into account in defining and revising the policies and strategies.	2.66	0.573	202

As far as criterion "Policy and Strategy of the Institution" is concerned the examinees do not have a clear view as to what extent the policy and strategy of the institution are in line with its mission, vision and values (M=3.19, sd=0.345) (PS1), if the central policy and strategy of the organization are not reflected clearly in writing (PS2) (M=3.04, sd=0.554) and whether and to what extent all the sections of the central policy of the organization are involved in the process of formation and notification of the policy and strategy of the institution (PS3) (M=3.25, sd=0.349).

According to the answers of the respondents there is no formal process of reviewing and updating the policy and strategy of the institution (PS4) (M=2.03, sd=0.394), the central policy and strategy of the institution is not structured in line with a strategic plan (PS5) (M=2.35, sd=0.410). Additionally, they argue that the targets of the central policy of the organization are not defined in writing and they are not quantified in a clear manner (PS6) (M= 2.49, sd=0.243). Neutral is the attitude of students surveyed on whether the objectives are communicated to all levels of the organization (PS7) (M=3.02, sd=0.255).

Moreover, survey respondents say that the principles of quality have not in any way been incorporated in all policies, strategies and objectives of the organization (PS8) (M = 2.29, sd =0.411). The students, who participated in the research, state that there is no procedure that allows the development of policies and strategies of the organization and their transformation within a short period (PS9) (M=2.38, sd=0.403). Finally, they do not have a positive or negative attitude about whether the formulation and review of policy and strategy includes the needs and expectations of the participants (PS10) (M=2.66, sd =0.573).

Next, the third factor of the EFQM model, which is the Human Resource Management, is examined. The Human Resource Management factor is composed of 10 questions relating to Human Resource Management, which are shown in Table 5, as follows:

Table 5. Human Resources Management

Human Resources Management	Mean	Std. Deviation	N
DA1. The human resources management determines the current and future needs of the staff regarding their knowledge, abilities and skills.	2.83	0.293	202
DA2. Training programs are developed by the human resources administration to improve knowledge, abilities and skills of the teaching staff.	3.30	0.451	202
DA3. Actions are promoted by the administration of human resources, which support the dedication and involvement of staff in actions of improvement.	2.66	0.504	202
DA4. Students are encouraged by the human resources administration to take initiative and perform actions of improvement.	2.86	0.564	202
DA5. Human Resources Management creates communication channels suitable for exchanging the best practices, knowledge and experience.	2.98	0.695	202
DA6. . Efforts aiming at improving quality either in an individual or team level are recognized	2.91	0.543	202
DA7. Social benefits and improvement of service and facilities for the staff are established by the Human Resources Management.	2.75	0.454	202
DA8. Active participation of personnel in actions regarding health, security, the environment and social and moral responsibilities is encouraged by the Human Resources Management.	3.54	0.570	202

As regards the criterion "Human Resources Management" the people asked had a neutral stance concerning the extent to which the Human Resources Management determines the current and future needs of the staff relating to their knowledge, abilities and skills (DA1) (M=2.83, sd=0.293) and if the HR Management develops training programs to improve students' knowledge, abilities and skills (DA2) (M=3.30, sd=0.451) and whether it promotes actions, which support the dedication and participation of the staff in actions aiming at improvement (DA3) (M=2.66 sd=0.504).

The students asked did not have a clear view as to whether the Human Resources Management encourages the staff to take responsibilities and also empowers the staff to take actions of improvement (DA4) (M=2.98, sd=0.695) and if it is in a position to create suitable channels of exchanging and communicating the best practices, knowledge and experiences (DA5) (M=2.31, sd=0.649).

Respondents do not seem to be able to know precisely if efforts for quality improvement are recognized in an individual or group level (DA6) (M =2.91, sd=0.543). Additionally, they are not sure whether social benefits of staff and improvement of services and facilities are established by HR management (DA7) (M= 2.75, sd=0.454). On the other hand, they state that active participation of the staff in issues related to health, safety, the environment and social and moral responsibilities is encouraged (DA8) (M=3.54, sd =0.570).

Then, the fourth factor of the EFQM model is examined, namely Cooperation and Resources.

The fourth factor is composed of eight questions on Cooperation and Resources which are as follows and are shown in Table 6.

Table 6: Cooperation and Sources

Cooperation and Resources	Mean	Std. Deviation	N
SYN 1. Partnerships are set up with suppliers to create values and mutual benefits.	2.86	0.946	202
SYN 2. Agreements are concluded, which guarantee the exchange of knowledge and experience with the suppliers.	2.95	0.345	202
SYN 3. Proper investments are attracted to develop policy and strategy of the institution as well as its continual improvement.	2.56	0.809	202
SYN 4. The right handling of inventories, materials and energy.	3.46	1.124	202
SYN 5. There is a determination and evaluation of the effect of new technologies to the institution.	3.37	0.682	202

SYN 6. Mechanisms are used for the collection and handling of data supporting the policy and strategy of the institution.	3.36	0.937	202
SYN 7. Mechanisms are operated aiming at determining the needs of the participants to be informed.	3.47	1.027	202
SYN 8. Information is utilized to constantly improve the management and service system.	3.17	1.022	202

More specifically, in regard to the criterion "Cooperation and Resources" the questionnaire takers express a neutral stance regarding whether partnerships are established with suppliers to create values and mutual benefits (SYN 1) (M=2.86, sd=0.946), whether agreements that ensure the exchange of knowledge and experiences with their suppliers are concluded (SYN 2) (M=2.95, sd=0.345) and whether the right investments are made for the development of policy and strategy of the institution with the aim of its continuing improvement (SYN 3) (M=2.56, sd=0.809).

Furthermore, the respondents do not have a crystallized opinion on whether inventory, materials and energy are appropriately managed (SYN 4) (M=3.46, sd=1.124) and whether there is a determination and evaluation of the impact of new technologies in the institution (SYN 5) (M =3.37, sd=0.682).

Moreover, respondents express neutrality regarding whether mechanisms for collecting and managing data supporting the policy and strategy of the institution are used (SYN 6) (M=3.36, sd= 0.937). Finally, the respondents do not have an opinion on whether mechanisms for determining information needs of participants are utilized (SYN 7) (M=3.47, sd=1.027) and on whether information for the continuous improvement of the management system and services is used (SYN 8) (M =3.17, sd=1.022).

Afterwards, we examine the fifth factor of the EFQM model, "Processes", namely the Educational, Research Processes and Administrative Processes.

The fifth group consists of 13 questions, of which 3 relate to the educational process, three to Research and 8 to Administrative Processes. They are as follows and are presented in Table 7.

Table 7: Processes

Educational Processes	Mean	Std. Deviation	N
ED1. The Educational activity responds to the needs and expectations of the students.	3.96	1.091	202
ED2. The Educational activity responds to the needs and expectations of the institutions/schools.	4.07	0.432	202
ED3. The Educational activity responds to the needs and expectations of society.	3.95	1.343	202
Research Processes			
ER1. The research process responds to the needs and expectations of the students.	3.45	0.865	202
ER2. The research process responds to the needs and expectations of the institutions/schools.	3.39	1.106	202
ER3. The research process responds to the needs and expectations of society.	3.41	0.997	202
Administrative Processes			
DE1. The central administration is making efforts towards tracking and analyzing basic procedures and actions.	3.06	1.239	202
DE2. There is printed material to support the processes (scope, integrated actions, reliability etc).	2.96	0.864	202
DE3. Responsibilities are delegated to periodically inspect and reevaluate the processes.	2.93	0.864	202
DE4. The information collected regarding the demands and suggestions of the participants is used afterwards to upgrade the processes.	3.12	1.327	202
DE5. Creativity and innovation are applied aiming at developing new processes and services.	3.42	0.863	202
DE6. Procedures are created in order to ensure adequate service offered to the participants.	2.96	0.532	202

DE7. Particular services are developed to support people and students.	2.965	1.063	202

As regards the criterion “Educational Processes”, the students asked claim that teaching activity meets the needs and expectations of students (ED1) (M=3.96, sd=1.091), the needs and expectations of organizations / schools (ED2) (M = 4.07, sd = 0.432) and the needs and expectations of society (ED3) (M=3.95, sd =1.343).

As regards the criterion 'research processes', examinees have no particular view as to whether the research activity meets the needs and expectations of students (ER1) M=3.45, sd=0.865), do not have a crystallized opinion regarding whether the research process meets the needs and expectations of organizations/schools (ER2) (M=3.39, sd =1.106), as well as the needs and expectations of society (ER3) (M=3.41, sd=0.997). As regards the criterion "Administrative Processes", the respondents do not have a clear opinion as to whether the central administration makes efforts relating to the identification and analysis of key processes and actions (DE1) (M=3.06, sd=1.239), whether there are printed support materials for the processes (scope, integrated actions, reliability, etc.) (DE2) (M=2.96, sd=0.864), if responsibilities are allocated for the periodic inspection and review of processes (DE3) (M=2.93, sd=0.864) and finally, if the information collected on the requirements and recommendations of the participants is then used to enhance the processes (DE4) (M=3.12, sd=1.327).

Respondents do not have a clear idea if creativity and innovation are applied in the development of new processes and services (DE5) (M=3.42, sd=0.863), whether processes are created aiming at ensuring adequate services for participants (DE6) (M=2.96, sd=0.532) and finally, if specific services are developed to support people and students (DE7) (M=2.965, sd=1.063) organization's values to all stakeholders or to the absence of updating all parameters that constitute the strategic plan, after an assessment based on quality assurance principles, and meet the needs and expectations of staff, or in the absence of participation of the parties involved, both individually and in groups, either in unilateral participation hinder the success of the organization.

What follows is the analysis of a cause and effect diagram (two levels) (Figure 1) with the five criteria upon which the model EFQM is based and with the results of this investigation and the attitudes of students in order to highlight the possible causes for the poor performance and lack of Excellence in Secondary Education.

Leadership adversely affects the ability of development and successful course due to lack of vision, values and ethics. This implies that leaders themselves do not defend the

values or are unable to transfer their vision to human resources and put achievable goals and cover all the needs of the institution. The lack of association of all stakeholders, staff and students, perhaps owing to the absence or lack of understanding of expectations, and the lack of improvement actions lead to failures and poor performance of the institution. The lack of recognition of all actions of the parties involved is a limiting factor and also hinders any future effort. In conclusion, it enhances low efficiency and minimizes any culture of excellence.

The absence of effective strategy and policy, which is due either to a vague wording of the vision in a long term context, a non-written wording of the goal setting and the absence of effective strategy and policy, which is due either to a vague wording of the vision in a long term context, a non-written wording of the goal setting and the organization's values to all stakeholders or to the absence of updating all parameters that constitute the strategic plan, after an assessment based on quality assurance principles, and meet the needs and expectations of staff, or in the absence of participation of the parties involved, both individually and in groups, either in unilateral participation hinder the success of the organization.

The human resource management is a key factor for the success of the organization because it encourages educational programs, activities of lifelong learning, the absence of which hinders any attempt for improvement, any prospect of professional development and career and consequently job satisfaction, any possibility of healthy cooperation among stakeholders, commitment of staff to the organization and promotion of abler people, thus cronyism is favored , intransparency, competitiveness among staff, and every opportunity to develop initiative and promote excellence is eliminated and thus the possibility of high performance of the institution is minimized.

The factor cooperation and resources is equally crucial in ensuring quality. The lack of effective resource management means the lack of respect for the environment and the waste of valuable energy and leads to lack of resources. On the other hand, the lack of effective cooperation not only of leadership with the staff but also of studentss with the students hinders any effort for development, leads to lack of investment and insufficient utilization of the potential of technology and know-how. Additionally, the lack of effective cooperation of the leadership with the suppliers hampers every effort to create values and mutual benefits.

The development of quality assurance procedures is of particular relevance. The absence of excellence in research activity by possibly incomplete training during

studies lead to incomplete response or unresponsiveness of the research activities to the needs and expectations of students, schools and society and inability to fully meet these needs. Poor functioning of the central management regarding administrative activities hinders any attempt to review these activities, and thus every effort to upgrade and develop creativity and innovation in order to develop new processes and services aiming at ensuring adequate services for students.

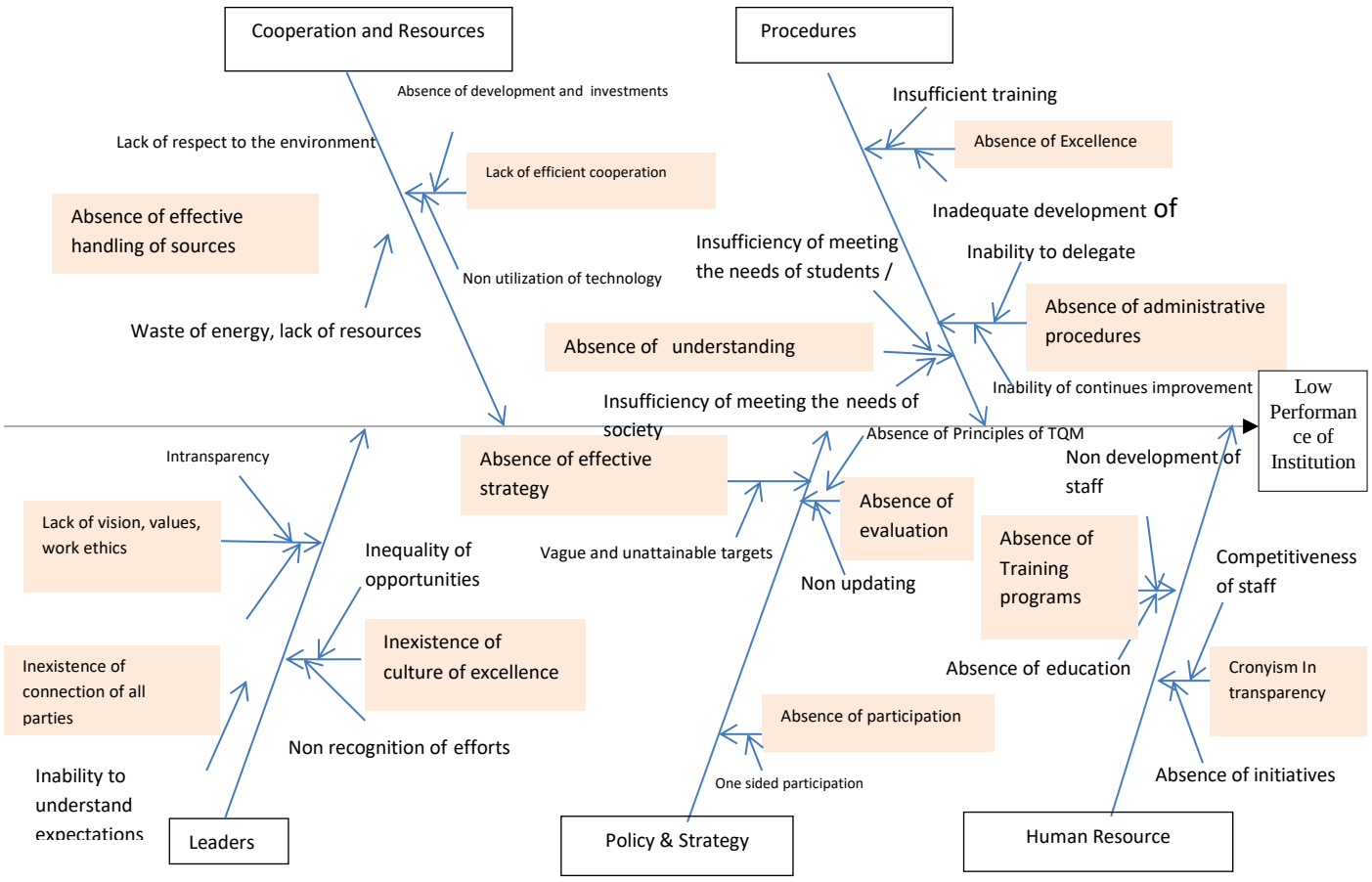


Figure 1: Cause and Effect Diagram

6. Conclusions

Quality assurance in Education is treasured. Consequently the main aim of the present study was Ishikawa's approach to Greek Secondary Education System evaluation regarding quality assurance according to the EFQM Model. As a result the Fishbone (Ishikawa) Diagram very well known as Cause–and–Effect Diagram clarifies all the factors or causes that affect each category separately, causing a poor performance of the Secondary school unit. Identifying the root causes is essential because only then school leaders, instructors, students will be able to suggest the right solutions to correct

or minimize them. Leadership should develop a vision for an efficient education that meets the needs of all parts of the institution and put the basis of a culture of excellence. Educational programs, activities of lifelong learning are some simple actions that could promote excellence and thus the possibility of high performance of the institution could be maximized. The encouragement of excellence in research activity could lead to complete response of the research activities and fulfill the needs and expectations of students, schools and society.

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