

Proposals to Strengthen the Implementation of Quality Management in Higher Education

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Abstract

The implementation of total quality management (TQM) has been widely adopted by several organizations of different sectors, with the goal of obtaining a competitive advantage in relation to their rivals. Likewise, higher education has grown the interest in adopting this methodology with the purpose of attracting increasingly more students for their institutions. However, after a literature review, several obstacles were revealed when trying to implement TQM in this sector, since some of its important concepts do not adjust to the specific requirements of the education sector. This document presents, on the one hand, a comparison between the countries with most ISO 9001 certifications and a world ranking of the best universities, proving that there is no relation between quality certifications and performance of the universities. On the other hand, quality tools are analyzed, and it is decided which of them could be used to create proposals for implementing, in a better way, the TQM in educational institutions and obtaining a real impact in their performance.

Keywords

Total quality management, higher education.

1. Introduction

Quality control and management comprise several strict practices that are usually associated with mass goods production industries, for example, automotive and metallurgical sectors, since people have a conception about quality which is heavily attached to standardization concept and products of the previously mentioned industries are true samples of standardized and standardizable products. Trying to understand the quality control and management role at less “tangible” industries (service industry) may be difficult, because in these sectors there are no physical products that undergo material strength tests or length measurements to compare with a reference model. One of these non-tangible sectors is the education sector, which is fairly far from goods industries in various aspects. The main difference between education and goods industries becomes evident at the end of the “productive process”, as education industry produces no material goods in a direct way, but knowledge that is shared to the students. For some authors, students are not customers in the education system, although they are the ones who obtain the cognitive stock shared by teachers. Instead, the client is the productive system that the professional faces after finishing their career (Bailey and Bennett 1996).

There are some different versatile tools in Total Quality Management (TQM) that are adaptable to different contexts as the education sector. The joint of tools such as Deming cycle or PDCA cycle (Plan, Do, Check and Act) and quality control and management formal practices has worked for other productive fields such as manufacturing and healthcare (Crawford 1994; Shortell et al. 1995; Schmele 1996). Regarding the education field, and specifically the higher education field, there are no mass antecedents about applying similar strategies, and one of the reasons is that there are multiple difficulties when implementing, since, as Cruickshank (2003) states, people often resist change, and in the academic field there is also a lack of credibility in methods even when statistics back them up.

If education must be quality guarantor, and traditionally known practices of goods industry are not easily attachable to services sector, the need of reinforcing existing methods regarding quality management at educational institutions

arises, thus hoping that the offered service meets the knowledge, learning and internalization objectives by students. This is why adopting specific TQM practices is needed, since it is not enough that educational institutions obtain quality certifications if their practices are not consistently quality accurate indeed (Fendt and Vavrek 1992).

1.1. Objectives

- Analyze the relationship between obtaining quality certifications and the performance of higher education institutions.
- Propose improvement strategies for applying TQM in the higher education field, using tools of quality control and continuous improvement.

2. Literature Review

There are many authors in the literature who have provided different definitions of quality management. According to Deming (1986), “quality management is a continuous learning process, year after year, with the management leading the whole organization”. Crosby (1979) states that total quality management (TQM) is a methodical way of ensuring that organized activities happen the way in which they are planned. Short and Rahim (1995) define it as a proactive approach to confirm the quality in product, service and process design, and thus continuously improve it. Goetsch and Davis (1994) believe that quality management is made up of a group of improvement activities that involve all parts of the business so that, with an entirely integrated effort, the improvement in the performance in all the levels of the organization is achieved. Thanks to this upgrade in the competitiveness of organizations who have implemented it as an important pillar within their company, quality management has been widely adopted by various productive and service sectors. In the same way, the implementation of total quality management (TQM) in higher education is related to increasing competitiveness among institutions, with the aim of drawing the interest of more and more students (Nasim et al. 2019). The literature review made by Cruickshank (2003) reveals the potential of the applications of TQM in diverse areas of higher education, such as the administration of the university functions, the study programs and the teaching methods.

Nevertheless, there is an information gap between manufacturing industry and higher education, with many breaches regarding TQM implementation (Koslowski, F.A. 2006). In a study carried out by Tang and Zairi (1998), some universities reported that TQM was being adopted only in some processes of the institution, which is an aspect that goes against the principle of the integration of quality management in the whole organization. Cruickshank (2003) affirms that it is required to integrate all the employees of the educational institutions to obtain the desired results, including the stakeholders. In this sense, authors such as Saunders and Walker (1991) examined the differences between the educative and manufacturing industry and found out that the main barrier of TQM implementation in higher education was to discover a suitable way in which the principles of quality were included, without losing sight of the goals of the universities, such as diversity, innovation and creativity.

Quality management has had to face many barriers when trying to be introduced in higher education, such as the skeptical attitude of the academics towards its application (Koch and Fisher 1998). Firstly, some scholars do not feel comfortable with the employee empowerment approach (Harvey and Langley 1995), due to the belief that this would be against the goals of the organization; and secondly, the institutions have an organizational culture in which the personal achievements have much more credit than the group achievements (Ruben 1995), which makes that teamwork loses strength.

However, the biggest problem emerges when it comes to answering the question: who is the client? Considering that, on the one side, some authors recognize the student as the client (Saunders & Walker 1991), and on the other hand, some teachers find it difficult to treat them as such (Bosner 1992). Willis and Taylor (1999) suggest that the student is both the final product and the client, which is a situation that produces a dilemma for the educational sector. Furthermore, TQM development in educational institutions often responds, more than anything, to the competitiveness of the markets and to financial resources of the universities, thus leaving aside the approach in which the performance improvement of the students is sought (Simangunsong, E. 2019). Gutierrez (2010) presents the meaning of quality certification and affirms that the fact of having one does not really mean that the practices of TQM are being developed inside an organization. All this issue is summarized by Fendt and Vavrek (1992), who believe that the inspection made by external entities is just that: an external review, since quality management cannot be evaluated in only one visit, as it is a methodology that lies in a continuous improvement with consistent steps that involve the entire staff of the institution. With this in mind, there are some institutions that use different models that implement the concepts of

TQM methodology and adapt them to a school environment. The great majority of schools and universities recognize these quality models, which have been previously investigated, to verify the performance of institutions in relation to the TQM philosophy (In' Airat, M & Kassem, A. 2014).

In conclusion, over the years it has been very difficult to adopt TQM in higher education institutions, mainly because the current system is not the most suitable to satisfy the requirements of the sector. Nonetheless, it is important to guarantee the quality of education, with the correct development of the student as an objective. The literature review carried out reveals the importance of proposing alternatives that address the problems identified, considering the TQM criteria and the objectives of the universities.

3. Methods

3.1. Comparison between ISO 9001 survey with positioning in world ranking universities

Based on the literature review, the following hypothesis was built: the quantity of ISO 9001 standard certifications in higher education is linked to the position of countries and their higher education institutions in one of the most prestigious rankings of universities worldwide. Afterward, it was intended to verify the hypothesis, expecting that the relationship would establish that the more certifications a country has, the higher its position in the ranking will be. For this reason, the countries considered had universities in the highest places of the QS World University Ranking (QS 2019), in which universities of the United States and the United Kingdom have representation. The same was expected for those countries who had the most quantity of certifications in the last period. Then, a statistical review was made of the quantity of certifications given by the ISO 9001 in 2018 (ISO 2018), and the five countries with the greatest number of certifications in the same year.

This exercise was developed with the purpose of verifying in a practical way the premise of Gutierrez (2010), who affirms that TQM is not only obtained with a certification but with the truly adoption of the quality conducts.

3.2. Quality Tools

Some tools were analyzed to manage the quality in the education sector (Table 1), nevertheless, not all of them are appropriate for this kind of organizations. That is why it was decided to assess the function of some of those techniques to subsequently choose the ones that are suggested to be implemented.

Table 1. TQM tools

Tool	What is it used for?
Control cards	As its name indicates, control cards try to control some aspects inside an organization, thus verifying that the proposed objectives are being achieved and previewing problems that could be present in the future through variability evaluation. In this way, preventive actions can be applied instead of reactive actions when there is a real problem (Gutierrez 2010).
Pareto chart	According to Gutierrez (2010), a Pareto chart is a special bar graph whose analysis field or application is the categorical data. Its objective is to help locating the vital problems and the most important causes. The principle is to choose a project capable of achieving the biggest improvement with the least effort.
Random sampling	It is common that to improve quality in productive systems, the attacked problems are those requiring a sample to be treated by statistical methods and obtain specific information that serves as support for making strategic decisions, looking for quality improvement (Gutierrez 2010).
Brainstorming	Gutierrez (2010) defines the brainstorm as a way of creative thinking

	aimed at all members of the group participating freely and contributing with ideas about a specific theme or problem. It is a very useful tool regarding integration and teamwork, by looking for problems to find a solution below. It is worth taking into account that this tool has a specific methodology that must be applied correctly.
Ishikawa's diagram	This tool can adequately complement the brainstorm, as it helps to organize the most important concepts in the previous phase to obtain a suitable perspective when identifying the biggest problems.
PDCA cycle (Plan, Do, Check, Adjust)	This cycle is very important in quality management, especially to structure and execute quality and productivity improvement projects at any hierarchical level in an organization (Gutierrez 2010). This means that it can work together with the last two mentioned tools because then a problem can be identified to propose a solution, and the project can be executed with the PDCA cycle.
Five S's	According to Gutierrez (2010), the five S's are a methodology that, with the stakeholder's participation, allows organizing the work places with the purpose of keeping them functional, clean, well-ordered, pleasant and safe.

3.3. Proposal

After outlining the current condition of quality in the educational sector, in the field of higher education worldwide, and studying what TQM establishes as practices for implementing in different industries (including their barriers), this study continues with the construction of multiple proposals, keeping in mind all the weak zones of the implementation of quality in higher education described in the literature review.

4. Results and Discussion

4.1. Comparison between ISO 9001 survey with positioning in universities world ranking

A statistical review of the quantity of ISO 9001 certifications (ISO 2018), made annually in the educational sector, revealed that at a global level this sector does not stand out compared with other markets such as the metallurgical or construction industries, among others. However, over the years it has shown an increase on the quantity of certifications, whose number grows proportionally to the most advantaged sectors.

According to the information obtained from the ISO 9001 survey (ISO 2018), it was evident that the growth of the number of certifications in the education sector worldwide is relatively good year after year, even though it is very distant from the metal products manufacturing industry. Education has the sixth part of the certifications obtained by the metallurgic sector, which is the one with the highest historical quantity since 1998.

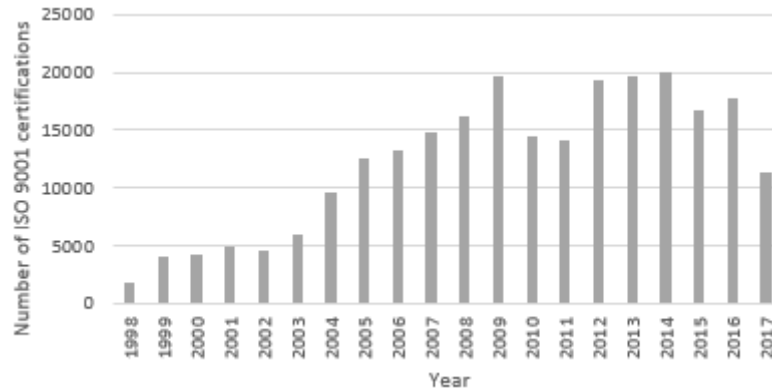


Figure 1. ISO 9001 certifications among the years (1998-2017)

The information exposed in Figure 1 shows that the education sector is still far from certifying quality in the totality of its processes despite the gradual increase of entities and programs certified by the ISO 9001 standard. Although this norm developed by the International Organization for standardization is not the only way in which an educational institution can certify that its processes obey to the most high-quality standards, or in general, that a particular industry can certify the quality of its processes, it is a good sample given that it represents all the market fields and their significance worldwide.

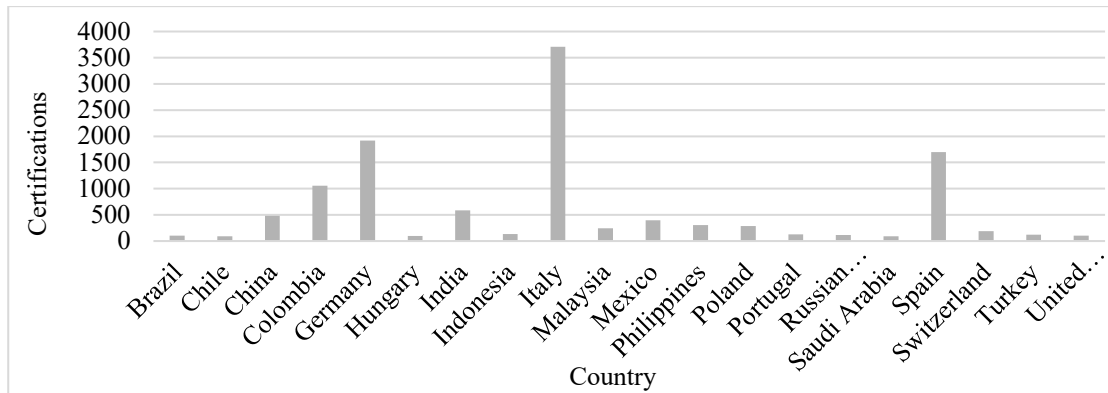


Figure 2. ISO 9001 education certification worldwide (2018)

Based on this premise, it was hypothesized that the quantity of certifications in the educational sector would be outstandingly high in those countries with the best universities of the world, but it was found that this was not the case. Based on the survey released in 2018 by the ISO 9001, the five countries with the greatest quantity of certifications in education were Italy (with 3709), Germany (with 1917), Spain (with 1699), Colombia (with 1059) and India (with 583), as shown in Figure 2, and countries that were expected to stand out, such as United States and England, did not. Seeking explanations of this event, two possible reasons were proposed. The first one is that the programs in countries that were expected to have the greatest number of certifications (United States, England, Switzerland, Singapore, etc.) are consolidated since many years ago, therefore, their certifications must be the same age. The second reason suggests that institutions of higher education count with quality certificates different from those offered by the ISO standard. This was confirmed since institutions such as Harvard University and Yale University (with 3th and 17th positions, respectively, in the QS World University Ranking - QS 2019) are certified by a North American institution: The New England Commission of Higher Education (NECHE), which counts with standards validated by the US government. Additionally, institutions such as the Massachusetts Institute of Technology (MIT), Stanford University and Berkeley University (with 1st, 2nd and 30th places, respectively, in the QS World University Ranking) are certified by ABET, which in turn is an organization certified by the ISO 9001. ABET grants certifications to institutions in areas related to Natural and Computational Sciences, and Engineering.

Taking into account the previous information regarding those countries that, due their quantity of ISO certifications in higher education, seem to be leading this sector, it is interesting to compare these numbers with those universities considered as the best ones of the world according to the QS ranking in 2019. This ranking shows that from the five countries with the most ISO certifications, just Germany has 3 institutions within the first 100 places in the ranking (Technical University of Munich in the 61st place, Ludwig-Maximilians-Universität München in the 62nd place and Ruprecht-Karls-Universität Heidelberg in the 64th place). The highest places of the other four countries are below the first 150 world ranking: Italy in 156th and 167th places (Politecnico di Milano and Sant'Anna - Scuola Universitaria Superiore Pisa, respectively), Spain in 159th and 166th places (Universidad Autónoma de Madrid and Universitat de Barcelona, respectively), Colombia in 272th and 275th places (Universidad de los Andes and Universidad Nacional de Colombia, respectively) and India in 162th and 170th places (Indian Institute of Technology Bombay (IITB) and Indian Institute of Science, respectively). Nevertheless, United States is the country who has most universities inside the ranking with 33 institutions (QS 2019). According to this comparison, it is clear that ISO certifications do not guarantee that those countries with most of them be the leaders in higher education, since they are widely overcome by other countries that do not pay much attention to these certifications.

4.2. Quality Tools Applied in Higher Education

Based on the examined information and considering that there exist various tools to implement quality within organizations, it is necessary to be careful at the time of choosing, because in the specific case of education, quantitative indicators may not be the most suitable to obtain a successful result. Since reluctance by the educative community to accept changes inside of the organization is one of the obstacles to overcome with greatest imperativity, a way to integrate everyone's opinion is to organize brainstorming sessions (Gutierrez 2010) with the purpose of identifying issues and of course giving solution to them, involving all the parties that comprise this community. When there are different perspectives, those must be organized according to their affinity through Ishikawa's diagram preferably (Gutierrez 2010), with the greatest specificity about all the problems presented by professors, students, and administrative staff. It is important to highlight that this initiative should be proposed by the high authorities of the institutions to give a message of formality; then, people will know that their opinion is valuable. When difficulties are already identified, knowing which of them should be prioritized, it is necessary to find solutions that satisfy the people who raised those concerns, so that when changes are made within the structure of organization or in any kind of modification, we can overcome the barrier that prevents improvement and quality implementation in these organizations.

When the changes to be made are clear (coming from the brainstorming), then, the PDCA cycle is fundamental (Gutierrez 2010). After completing the first and second stages, now it is time to verify that the changes do represent a real solution to the previous problems. Normally in the verification process, it is found that some faults persist, and that is why it is necessary to act again and repeat the cycle to obtain the best possible improvement.

To the correct development of the activities that each person must do, whatever its function in the institution is, we suggest that they follow the recommendations of the Japanese tool, that is, the five S's (Gutierrez 2010). The first one that is related to "select", which means choosing only the objects that are necessary to the work that is going to be done, thus removing from the workspace all the elements that are useless in that specific moment. The second one is involved with the order of the elements chosen in the last step, so that they can be used quickly and easily, thus minimizing movements with the slogan "a place for each thing and each thing in its place". Since this tool of the five S's focuses mostly on the workstation, the third of them is about cleaning in order to have an adequate place to perform the activities. For this purpose, the main sources of dirt must be determined and eliminated, thus cleaning becomes part of the daily routine. The next S refers to standardizing the activities to do, thus providing skills to the worker or student to identify anomalies in the process. Finally, there must be discipline appropriating behaviors, by controlling activities and the use of the PDCA cycle is encouraged.

4.3. Proposals

The quality in education is commonly associated (in Latin American countries) with two scopes that should not be fundamental pillars for this essential sector: advertising and status. According to Portocarrero-Sierra et al. (2020), in Latin America there is no attempt to achieve equity from education, otherwise it is used as a political tool to favor figures in accountability by deviating priorities. This is evidenced in the academic offers that present different institutions to students that are looking for a place that allow them to develop studies of higher education. These offers often have as a flag of their program their possession of some type of quality accreditation, thus presenting themselves

as a safe investment for the client, who is understood in this context as the student. The main interested parties in guaranteeing a quality education (not just for certifications without typical practices of total quality management) should be the government administrations and companies, that is, the public and private sector, since the product of universities is the future staff that will dinamize the different productive sectors. For this reason, following proposals were made to ensure a total quality management in the education sector:

1. Active participation of the private sector in building and development of the study plan:

Continuing in the line of the productive sector as a client of education (Bailey and Bennett 1996), it must watch for good practices inside universities, therefore, it is suggested that entrepreneurs and directors of companies in the private sector of different economies have voice within the college councils as in the case study mentioned by Cruickshank (2003). Since this sector knows the needs of the productive system, when linked with pedagogical entities, it will be possible to design strategies for giving students useful tools for the job world, thus contributing to competitiveness, in contrast with students from institutions that make no effort to implement quality. This proposal follows the appreciation of Harvey (1998), who talks about identifying the motivations of stakeholders to develop an effective long-term plan.

2. Creation of a monitoring system for objectives tracked by entities in charge of national education:

The beginning of quality management indicates that TQM requires active participation from all the actors that comprise the environment (Gutierrez 2010), therefore, it is suggested to include spokesmen of different parts that actively participate in the construction of a monitoring system of results obtained to adjust those aspects that do not contribute to significant areas to the project. To follow this process, it is possible to use tools like brainstorming, control cards for variables (following up data that relate statistics of dropout rates and academic success), among other tools of statistical management.

3. Make the student an internal observer:

Fendt and Vavrek (1992) affirm that the external inspections are only reviews that do not assure quality. This can be caused by the institutions that prepare for evaluation visits from the entity that certifies them, without making real changes in their practices. To strengthen the quality internalizing practices and concepts a feeling of belonging must be instilled in the student to the institution while he is aware that he is a client of a system (seen from an individual perspective), so that the student has the capacity to identify the daily practices that are inside the institution and that do not belong to TQM. This can guarantee some analog inspections to those made by academic peers but with greater rigor and during a continuous period, in order to prevent that institutions, prepare only for evaluation day without real internal changes, hence the evaluation would be permanent and from the inside.

4. Identification and strengthening of the fundamental pillars of education:

The contribution that the different parts of the educational system make to the system itself must be measured, in addition a diagnostic of the actual state in order to weigh and prioritize the strengthening of the areas that require it, thus ensuring an internal balance of the components of the educational system. As possible pillars suggested, we found the teaching, research, extension, and teaching methods (Hebert et al., 1995; Vazzana et al. 1997).

5. Pedagogy certification required for teachers:

One of the most important factors in education performance are teachers, owing to their role as “knowledge facilitators” (Lovren V.O. 2017), then, it is important to guarantee that they are the most suitable people for this teaching job. Consequently, it is proposed that each teacher compulsorily has a pedagogy certification, since it is not enough for a teacher to know in depth any topic and/or being academically recognized if they do not know how to transmit all the knowledge to their students, which would mean that the person is not able for teaching.

6. Periodical training about new teaching mechanisms:

Teaching tools are constantly evolving as well as teaching methods, thus it is considered that teachers should have periodical training about new teaching ways, which we consider must be assessed for ensuring that the process is being useful for them and their students. This proposal obeys to the principle of continuous improvement in quality management (Gutierrez 2010).

5. Conclusions

In summary, it was found that counting with many quality certifications does not imply that a country has the best rated or recognized institutions in the world. After checking how well positioned are the best universities of each of

the countries with high number of certifications (Germany, Italy, Spain, Colombia and India), it was found that only one of them has some universities within the first 100 positions, while the others are not close to this privilege.

It is necessary to emphasize on the proposed tools to improve quality management, since they aim to attack the recognized problems in the literature review, especially as pointed out by Cruickshank (2003) about the inclusion of all the staff that comprise the higher education institutions. There exists a tool derived from the TQM techniques that fits ideally this issue: brainstorming, which integrates all the parts that compose the organizations of interest covered in this article and is also complemented by other practices like the Ishikawa's diagram and the PDCA cycle to organize the obtained ideas and check the projects to implement.

Finally, concrete proposals are presented covering from the design of study plans that fit the demand in the world of work by the same business to which future graduates will belong, to using the student to check that the objectives are achieved inside of academy and qualify the professors for the transmission of knowledge to be effective. What is expected from the graduates is to supply the needs of the professional world. Besides training in pedagogy for professors, it is important that they update their knowledge about new techniques and methods of teaching, always searching the best possible way for the training of students, thus guaranteeing the quality of institutions and satisfaction of both the graduates and the companies in which they will work.

In conclusion, this article stands out for performing a literature review that helps to understand the real issues in the sector of interest (in this case, the education). Additionally, it exposes the insufficiency that quality certifications present, since they do not check the real performance of the institutions. It also shows how to attack those problems through checked and effective strategies to finally offer concrete and comprehensive proposals with clear objectives.

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