Perception of University Students on the Concepts of Quality and TQM

Emerson Wagner Mainardes\textsuperscript{1} \\
Luis A. N. Lourenço\textsuperscript{3}

Abstract- The major objective of the present research was to reveal how undergraduate students at University of Beira Interior (UBI) understand the meaning of the phenomena quality and total quality management (TQM). The paper begins with a review of the historical evolution of the main concepts of quality and TQM. Following, the phenomenographic method, of exploratory-qualitative type, was used in the research. Data was collected through a structured questionnaire applied to 144 students from the most important areas UBI (Communication Sciences, Biochemist, Medicine, Management and Civil Engineering). Based on content analyses, it was possible to conclude that there is no predominant quality concept. In fact, the concept of quality as “conformance to specifications” is predominant on students from health and sciences areas. On the contrary, social sciences’ students understand quality as value and as meeting and exceeding customers’ expectations. With respect to TQM, it was possible to verify an almost complete ignorance of such phenomenon. These results can help the organizations understanding how future professionals, of the different areas, understand quality, thus facilitating their decisions when they focus on quality for competitive advantage.

Keywords-Quality; Total Quality Management; Phenomenography.

I. INTRODUCTION

Defining quality is a challenging exercise. According to Gomes (2004), quality is easy to recognize, but it is difficult to define. In accordance with Reeves and Bednar (1994), there is no global definition and different quality definitions in different circumstances arise, making it a complex phenomenon. We live in a time of enormous competition, and quality is seen as one of the main competitive differentiators, in today’s companies. But what is quality? Quality can be defined in several ways: quality as value; quality as conformance to specifications; Quality as conformance to prerequisites; Quality as adjustment of the product/service for the user; Quality as reduction of losses; Quality as achieving and/or surpassing clients’ expectations (Reeves and Bednar, 1994).

Which definition is more correct? This question is yet to be answered. The fact is that quality is considered universally as something that affects the lives of organizations and the life of each individual, in a positive way (Gomes, 2004). This way, it is important to understand this phenomenon, as it represents an important instrument for business. This way, it is important to understand this phenomenon, as it represents an important instrument for business management in a competitive turbulent and market (Piovezan and Carpinetti, 1998).

No exact definition of quality is essential, but it is important to be understood by all professionals within the company’s process (Nadler and Tushman, 1994). This way, it is important to question whether the quality phenomena and total quality management are understood by the market professionals, especially the youngest and current students of several courses. Therefore, this study aims to answer the following question: How students, attending the main courses at University of Beira Interior (UBI), understand the concept of quality and total quality management?

The main purpose of the study is therefore to reveal the knowledge that students, attending the main courses at UBI, have of quality phenomena and total quality management. The specific objectives sought to: (a) define which concept of quality, present in the literature, is closer to the knowledge of students from each course; (b) define which concept of total quality management, present in the literature, is closer to the knowledge of pupils from each course; (c) compare the knowledge of quality and total quality management among courses.

To understand the perception of individuals on a given concept, a phenomenographic research is used. This research method has, as its main feature, the description of a phenomenon as it is experienced, emphasizing the collective significance of the researched phenomena, which should not be confused with phenomenological studies. The survey is useful for market managers, since it clarifies the true knowledge of future professionals regarding quality and total quality management. It is useful to the Higher Education Institutions (HEI), because it identifies which is the level of knowledge that their current students have upon the analyzed topics. The contribution of this research is also extended to the Academy, by presenting the concepts of quality and total quality management that are more present in the minds of future market professionals.

When carrying out this study, the terms quality and total quality management were initially revised, their historical retrospectives and its concepts according to several authors that deal with these topics. Next, the survey methodology was presented. As a result, the data was collected and
analyzed. To conclude, the conclusions and recommendations are presented.

II. QUALITY CONCEPTS

Although quality is a millennial concept always present in the history of mankind (Avelino, 2005), only in the 20th century did it effectively became focus of organizations. With the growth of consumption and the market, companies are obliged to deal with quality in a more cautious manner (Oakland, 1994). Thus, the main names related to quality appeared (Avelino, 2005) some of them became very popular and hence significantly influencing the history of quality: W. Edwards Deming, Philip Crosby, Joseph M. Juran, Kaoru Ishikawa, and Genichi Taguchi are some of them. The term quality has been used in various situations, not always with a clear and objective definition. In other words, quality is not easy to define, it is apparently intuitive. Its interpretation depends on the point of view of the person who analyzes it. It is common for a product/service to have quality for one person and not for another (Carvalho, 2007).

In the study of Garvin (1992), the author identified five ways to define quality: the transcendental (feeling of quality when trying a product), focused on product (characteristics that differentiate a certain product from other similar products), based on value (product with high performance with an acceptable market price), appreciated for its production (positively meets the specifications of the project when manufacturing the product), and the customer's point of view (consumer preference for a certain product that meets his/her needs, given a specific combination of its attributes). Soltani et al. (2008) deepens the analysis of Garvin (1992) and concludes that quality is a continuous process of improvement. Meredith and Shafer (2002) see quality as an effective way to produce at a good price, low-cost and customer satisfaction, making the company competitive in the market. ISO 9000:2005, IPQ (2005) defines quality as “degree of requirement satisfaction given by a set of intrinsic characteristics” (p. 16).

In summary, quality is the ability of any object or action to correspond to the proposed objective (Crosby, 2000; Loenert, 2003; Morejón, 2005). These various definitions lead to one conclusion: According to the situation, the concept changes. And, for being a broad concept, the topic of quality tends to relate to various aspects organizations: market participation, costs, and profits, among others. This way, with a thorough and comprehensive work, Reeves and Bednar (1994) analyzed each definition and its characteristics. Some results of this study can be seen in table 1.

In the analysis of table 1 it is verified that: (a) new definitions of quality did not supplant older definitions; (b) no definition is better in all situations, i.e. all have strengths and weaknesses in terms of, measurement, generality, management or relevance to the customer. This way, it is concluded that any of the settings shown in table 1 can be used, as the situation.

In more recent studies, Dale, van der Wiele and van Iwaarden (2007) reviewed the concepts of quality. It was found that little has changed since the Reeves and Bednar study (1994) to present date. The phenomenon quality

<table>
<thead>
<tr>
<th>Concept</th>
<th>Characteristics</th>
</tr>
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<tbody>
<tr>
<td>Excellency</td>
<td>Older concept; Philosophy of being the best, better than others; Abstract concept.</td>
</tr>
<tr>
<td>Value</td>
<td>Second concept; Relates to the relation between price X benefits; Promotion of a product or service depends on various factors (convenience, price, service, needs, among others); Abstract concept.</td>
</tr>
<tr>
<td>Conformance to specifications</td>
<td>Concept emerged with manufacturing; Focuses on product standardization; Avoids losses and waste; Controllable quality; The conformity of products compared to the specifications of the project; Product free of deficiency; Focus on monitoring tools; Perfection in production; Objective and quantifiable concept.</td>
</tr>
<tr>
<td>Meeting and/or exceeding customer’s expectations</td>
<td>Concept has undergone strong influence of the services sector, being the most recent; Product or service that best meets customer’s requirements; Characteristic of products and services that meet customer’s expectations; Satisfaction of customer’s expectations; Abstract concept.</td>
</tr>
</tbody>
</table>

Source: adapted from Reeves and Bednar (1994)
According to Castro et al. (2007), to achieve better quality, it is necessary to administrate it. Similarly, Andersson, Eriksson and Torstenson (2006) defined that organizations which desire to add value to their services and products should standardize processes, and, at the same time, meet customers’ expectations. Second Poubel (2007), quality management aims to ensure that the project will be completed with the desired quality, i.e. meet customer needs and product requirements. In this management process, the focus is to avoid failures. Quality management involves planning, quality assurance and control (Esrig-Tena, 2004).

According to Casals (1997), numerous reasons and situations stimulate an organization into doing management through quality: meeting/exceeding customer’s requirements; improving the company’s image; gain market; improving the morale of its staff; troubleshooting responsibility issues; improving process documentation, products and services; improving the physical environment of the job. This way, quality management suggests a new philosophy that uses the basic quality as an attribute in all processes, going through everyone in the organization in solving problems; and support from top management.

The fundamental assumptions that support the TQM vision: quality costs reduction such as development of processes that ensure quality; staff support in quality improvement; involvement of all sectors of the organization in solving problems; and support from top management.

<table>
<thead>
<tr>
<th>Authors</th>
<th>TQM Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Merli (1993)</td>
<td>Set TQM at four points: complete satisfaction of the customer; quality above all; continuous improvement; involvement of the company’s staff.</td>
</tr>
<tr>
<td>Ross (1993)</td>
<td>Management philosophy that includes a set of actions focused on continuous improvement, meeting customers’ expectations/ needs, long-term planning, reduction of rework, teamwork, redesign of processes, competitive benchmarking, evaluation of results and a close relationship with suppliers.</td>
</tr>
<tr>
<td>Hackmann e Wageman (1995)</td>
<td>The fundamental assumptions that support the TQM vision: quality costs reduction such as development of processes that ensure quality; staff support in quality improvement; involvement of all sectors of the organization in solving problems; and support from top management.</td>
</tr>
<tr>
<td>Damazio (1998)</td>
<td>Philosophy that uses the basic quality as an attribute in all processes, going through everyone in the Organization and doing it right the first time. TQM principles were defined: total customer satisfaction; participatory management; human resources development; constancy of its purposes; continuous improvement; process management; delegation of powers; information and communication management; quality assurance.</td>
</tr>
<tr>
<td>Scott (1998)</td>
<td>Defined that the values which are more related to TQM are: customer focus, continuous improvement, and teamwork.</td>
</tr>
<tr>
<td>Bianco e Jacou (2000)</td>
<td>Management model centred on quality, counting on the participation of all its members and seeking long-term success through customer satisfaction, and benefits for all members of the Organization and for the society.</td>
</tr>
<tr>
<td>Grohmann (2000)</td>
<td>TQM is the measurement of results achieved in all organizational processes, to find out whether the objectives have been achieved, detect causes of bad results and try to repair them.</td>
</tr>
<tr>
<td>Meredith e Shafer (2002)</td>
<td>TQM involves steps: define what the customer wants; develop products that meet/exceed customer expectations; develop a production system that helps to get it right the first time; monitor the system, and make adjustments to its improvement; and include customers and suppliers in the process.</td>
</tr>
<tr>
<td>Kujala e Lillrank (2004)</td>
<td>Quality is a responsibility of all the staff, covering every aspect of the company operation, being a systemic issue. Guaranteeing quality of the system, total quality is guaranteed.</td>
</tr>
<tr>
<td>Dale, van der Wiele e van Iwaarden (2007)</td>
<td>TQM is the mutual cooperation of all in the Organization and is associated to the processes that aim to produce products and value-added services that meet and exceed the needs and expectations of customers. The TQM develops methods and processes that cannot be copied by competitors.</td>
</tr>
</tbody>
</table>

Source: Own elaboration
In summary, despite several definitions (table 2), a common point: TQM should not only be restricted to productive areas. I.e. it should involve all functional areas of an organization: from production to marketing, sales, purchasing, engineering, distribution, handling, among others. The use of TQM, must not only establish internal objectives of the company, but also establish objectives for the relationship between the company and the consumer market and the enterprise with the country (Avelino, 2005).

IV. RESEARCH METHODOLOGY

This study used the phenomenographic methodology, characterized for being qualitative, of exploratory and cross-section type, with data being collected through personal interviews with structured questionnaires (Barnard, McCosker and Gerber, 1999; Akerlind, 2002; Neves, 1996; Marconi and Lakatos, 1999; Hair et al, 2005). Senior students of the main courses were inquired (higher number of students) of a public University in Portugal, which makes it a case study (Yin, 2005). The choice of this audience was due to the fact they are completing their course and in a few months they will be the youngest professionals in the market, besides this, they have already done all subjects of their course, which allows a real picture of its performance in the market.

The choice of UBI was due to the fact that this University receives students from various places in Portugal. For being a university based in a small town in the Interior of Portugal, the vast majority of its students are from other cities. This diverse nature of students at this institution establishes that the results obtained here shall present a better view of the new set of professionals of the market to the country, unlike other universities, where students, mostly come from their own town, where the University is located (major centres or regional centres).

For the selection of courses, the choice went to main integrated superior courses/masters (the largest number of pupils, greater presence in the market after completion of the course) of each of the five Faculties, allowing a broader overview. The selected courses were the following: Communication Sciences, the Faculty of Arts; Biochemist, the Faculty of Sciences; Medicine, Faculty of Health Sciences; Management, Faculty of Social Sciences and Humanities and Civil engineering, Faculty of engineering.

To meet the requirements of the research, 20 to 60 students of each course were selected randomly, as guided by Shanahan and Gerber (2004). The choice of the sample was held with students present in the classroom on the day the research was applied. This is a non-probabilistic intentional sample, by trial (Marconi and Lakatos, 1999).

For collection of data, a set of personal interviews with structured questionnaires were used (Marconi and Lakatos, 1999). It was developed, in accordance with the guidelines of the phenomenographic method (Akerlind, 2002), a questionnaire with six questions that characterize the interviewee and four open questions, which sought to identify respondents’ perceptions of their own definitions of quality and total quality management.

Data collection was carried out in the period from 22 to 29 April 2009. 144 senior students of five courses at UBI replied in a valid way to the data collection instrument. Content analysis was used to analyse the data (Kude, 1997), that aimed to find quality settings and total quality management through coding (Bandeira-Melo e Cunha, 2003), with the help of Atlas/ti software (Muhr, 1995).

V. RESULT ANALYSIS

Having coded and collected the data, the next step was to perform the analysis of the students’ responses who participated in this research.

A. CHARACTERIZATION OF THE RESPONDENTS

To start the analysis, the first step was to characterize the respondents. This characterization is summarized in table 3.

<table>
<thead>
<tr>
<th>Course</th>
<th>Communication Sciences</th>
<th>Biochemist</th>
<th>Medicine</th>
<th>Management</th>
<th>Civil engineering</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student respondents</td>
<td>23</td>
<td>21</td>
<td>52</td>
<td>21</td>
<td>27</td>
</tr>
<tr>
<td>Average age</td>
<td>21,4 years old</td>
<td>21,5 years old</td>
<td>24 years old</td>
<td>24,4 years old</td>
<td>24,9 years old</td>
</tr>
<tr>
<td>Gender</td>
<td>10 men e 13 women</td>
<td>7 men e 14 women</td>
<td>10 men e 42 women</td>
<td>7 men e 14 women</td>
<td>20 men e 7 women</td>
</tr>
<tr>
<td>Previous studies in quality</td>
<td>No – 23 Yes – 0</td>
<td>No – 12 Yes – 9</td>
<td>No – 18 Yes – 34</td>
<td>No – 3 Yes – 18</td>
<td>No – 27 Yes – 0</td>
</tr>
<tr>
<td>Professional experience</td>
<td>No – 10 Yes – 13</td>
<td>No – 12 Yes – 9</td>
<td>No – 37 Yes – 15</td>
<td>No – 5 Yes – 16</td>
<td>No – 8 Yes – 19</td>
</tr>
</tbody>
</table>

Source: Own elaboration

- Students of communication sciences are very young; no professional experience; no one previously claimed to have studied quality;
Biochemist students are also young people, with predominance of women and little professional experience; 14 students said to previously have studied this subject.

Final year medical students are in average 24 years old; the majority are women and with little professional experience; 34 students said to have studied this subject.

Management students have a relatively high average age (24.4 years old), they are mainly women, and with greater professional experience; 18 said to have already studied (or are currently studying) quality; this course is unique among the researched courses which researched that provide a specific quality subject (optional subject).

Civil engineering has the highest average age (24.9 years old); it is mainly a male course with many students with professional experience; all students declared not to have previously studied the subject quality.

B. COMMUNICATION SCIENCE COURSE

The most present concept of quality among students of this course was "quality as value", with 15 quotations. Most students associated quality to the benefits of a product or service related to price and other factors (easy to reach, fulfilment of needs, among others). It was clear that quality relates to the added-value of a product or service. Other concepts also emerged: 8 quotations of "quality as meeting/exceeding customers’ expectations", 7 quotations of "quality as conformance to specifications", and 2 quotations of "quality with excellency". This diversity of concepts represents the subjectivity of the term quality for individuals who have never been in contact with academic subjects related to quality.

This last finding becomes clearer when students were asked about total quality management (TQM). The variability of responses were vast, but the concept which is more present in the mind of students was "management of enterprise processes to achieve better results", with 9 quotations. Others related TQM to "quality control" (7 cases), to "continuous improvement" (3 cases), to the "action of people in the Organization" (2 cases) and to "quality departments" (1 case). Six students claimed not being acquainted with TQM. Students’ vision of TQM is related to the Organization's internal environment.

C. BIOCHEMISTRY COURSE

The concept which was more present among these students was "quality as conformance to specifications", with 13 quotations. These students believe that a product or service is of quality when it follows all the production requirements. The predominance of this concept is understood, because they are potentially professionals who have major concerns with internal processes in General. Other concepts also emerged: 6 quotations for "quality as meeting customers’ expectations of ", also 6 quotations for "quality as value, and 5 quotations for "quality as excellency".

The two definitions of TQM more present in the students minds were: "planning and leading processes in order to achieve the desired results" (9 quotations) and "problem solving" (8 quotations). Other definitions have been observed: "quality control" (5 quotations), "decision-making by top management" (2 quotations), "management of personnel attached to the product/service" (2 quotations), "meet customers’ expectations" (1 quotation), "create a good working environment" (1 quotation), "continuous improvement" (1 quotation). Two students claimed not being acquainted with TQM. In this case it is observed that TQM involves, above all, the entire internal organizational environment, but in a broader perspective (quality planning, problem solving and quality control), closer to a systemic vision, referred to by Kujala and Lilirank (2004).

D. MEDICINE COURSE

Among future doctors, there was a clear balance between two concepts: "quality as conformance to specifications (27 quotations) and "quality as value" (22 quotations). The concept of "quality as meeting/exceeding customers’ expectations" received 15 quotations. As for the concept of "quality as excellence" this was quoted only 4 times. In short, for future doctors, quality is much more related to outstanding development of impeccable process than excellency or even quality as exceeding customers’ expectations. As for the concept of value, also quite indicated, it is understood that students see quality as a way of appreciating the doctor.

As for total quality management, a number deserves special attention: 12 students stated to have no knowledge of TQM. With regard to students who gave some TQM definitions, these definitions focused on 4 quotations: "process management" (19 quotations), "means to achieve desired results" (15 quotations), "resource management" (14 quotations) and "quality control" (12 quotations). These definitions brought by students were close to the results of Slack, Chambers and Johnston (2002), which highlighted TQM as being a way to manage resources and processes to control quality and achieve organizational objectives.

E. MANAGEMENT COURSE

Most management students (16) identify the term "quality as meeting/exceeding customers’ expectations." Other quality concept were also quoted: "quality as conformance to specifications", with 10 quotations (highlighting the issue reduction of production costs), and "quality as a value", with 6 quotations. "Quality as excellence" was not quoted by any student. Analyzing the answers, it is understood that most of these students, especially those working or that have worked in the labor market, refer to quality as a means of meeting and exceeding customers’ expectations, something which is essential nowadays for a great number of organizations, in addition to being a constant concern of the market managers.

As for the concept of total quality management, a diversity of settings was verified. The most quoted (9 quotations)
was "management of business processes to ensure the quality of its products and services". Also to be highlighted "the development of top management policies with" (5 quotations) and "actions to achieve the company’s desired results “ (5 quotations). "Quality control" was also referred to with (3 quotations), "quality certifications" with (2 quotations) and "zero defect production" (1 quotation). There were 6 negative highlights of students who claimed not being acquainted with TQM, despite being in a management course. When observing the results, total quality management is seen, once again, as something internal to the organization, of a systemic character, as Kujala and Lillrank (2004) quoted. 

F. Civil Engineering Course

This course shows a balance between three concepts: "quality as conformance to specifications" (17 quotations), specifications " was totally expected, since engineering is much more related to technical aspects, nevertheless this was not totally confirmed. Students also related quality to clients and to the value-added of a product or service, important to conduct the job. As for total quality management, students’ main response was "way to achieve the objectives of the Organization" (15 quotations). Another common response was "management of the organization’s internal processes" (11 quotations). Other less frequent responses were: "quality control" (6 quotations), "enterprise task management" (3 quotations), and "continuous improvement" (2 quotations). With these answers, it is verified that these students’ knowledge is close to the concept proposed by Hackmann and Wageman (1995), where quality is obtained from management of the organization’s internal processes.

G. Comparison among Courses

Gathering the answers from all surveyed courses, a comparison between courses can be carried out. Table 4 presents all grouped results.

Table 4 – Summary responses of the five courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Communication Science</th>
<th>Biochemist</th>
<th>Medicine</th>
<th>Management</th>
<th>Civil Engineering</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predominant quality concept</td>
<td>Value</td>
<td>Conformance to specifications</td>
<td>Conformance to specifications; Value</td>
<td>Meeting/exceeding expectations</td>
<td>Value; Meeting/exceeding expectations; Conformance to specifications</td>
</tr>
<tr>
<td>Predominant concept of Total Quality Management</td>
<td>Management of a company’s processes; quality control</td>
<td>Plan and leading processes; problem solving</td>
<td>Process management; asset management; quality control</td>
<td>Management of company processes</td>
<td>How to achieve the objectives of the organisation; internal processes management organization</td>
</tr>
</tbody>
</table>

Source: Own elaboration

Making a comparative analysis among all courses, it is verified that:

- Courses where most students have professional experience see quality as value or as meeting/exceeding customers’ expectations; on the other hand, courses with a majority of students who have no professional experience see quality as conformance to specifications;
- Exact and health areas, have a predominance of the concept of quality as conformance to standards and specifications, different from social science courses, where value and customer expectations and exceed standardization in the production of products/services;
As for total quality management, there is uniformity in the replies, i.e. internal processes management of the organisation and TQM as a way to achieve the organizational goals, predominant concept among all pupils. In summary, the comparison among courses showed that whether or not studying quality, the concept is easy to be recognized and difficult to be defined (Gomes, 2004). Even among the youngest professionals in the market and senior students in superior courses that will soon be in the labour market, there is no predominant concept in quality and there is a striking lack of knowledge regarding total quality management.

VI. CONCLUSIONS AND RECOMMENDATIONS

Understanding how the new market professionals see quality, allows business decisions when they focus on quality as a competitive differentiator. This context motivated the study. Thus, the aim of the study was to reveal the knowledge that students attending the main courses at (UBI) have regarding quality and the total quality management phenomena.

At the end of the research it was concluded that the topic of quality is not consensus among all professions that participated in this survey. For future health care professionals, quality and conformance to specifications, a perfectly justifiable concept due to the responsibility of individuals whose role is to look after people’s health. Also in exact areas, the concept of conformance to specifications was pointed out (despite the good presence of concepts such as value and meeting/exceeding customer’s expectations), mainly because they are more technical professions which require special care with processes and ways of product and service development. As for the professions related to social sciences, whose primary interest is the human being, quality becomes more subjective and linked to value-added and meeting of customers and users’ expectations.

As to the total quality, in all courses little knowledge of the phenomenon was noted, although respondents have good perception of TQM. However, this lack of TQM knowledge complicates implementation in organizations, which might result in resistance of professionals who do not understand perfectly well the objectives of TQM and believe that quality is the responsibility of a specific department in the company.

With regard to specific objectives, it was possible to identify the quality concepts (first objective), and total quality management (second aim) present in the literature which are closer to students’ knowledge in each course. For the third specific objective, comparing the knowledge of quality and total quality management among the courses involved in research, it was concluded that courses related to health and exact areas tend to be more focused on conformance to specifications and human courses focus more on meeting customer’s expectations and adding value to products and services. As for TQM no striking differences were observed.

Finally, it is important to highlight the limitations of the study. The main limitation was the achievement of an exploratory investigation, without statistically valid samples. The continuity of study is recommended, with replication of the same search for other courses of UBI, as well as further investigations in other Portuguese universities and thus to generalize the results and define which quality concepts and total quality management the youngest professionals in the market have in mind.

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