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# Application of business quality management tools in higher education: an exploratory literature review

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**Abstract**

The purpose of the study is to explore existing literature on quality management tools applicable in higher education and identify major critical factors of TQM adapted from the business sector. A major part of the research focuses on an exploratory literature review of the most well-known existing business quality management tools applicable to higher education.

Design/methodology/approach – An exploratory literature review was conducted using a well-known, highly respected database "Web of Science Core Collection".

Findings – The presented study offers a deep literature analysis of effective practices for implementing quality management tools in higher education.

The practical value of the paper is university administrators and quality managers can apply it as guidelines in selecting the best cases of quality techniques applicable in their organizations for strategic development, university performance and quality improvement.

The originality of the paper - is it can serve as a theoretical guideline for regional academics, scholars and university managers and administrators to define an appropriate quality management tool to meet requirements of external stakeholders (employers).

*Keywords:* Quality management, Total Quality Management, quality management techniques, literature review

# Жоғары білім беру саласында сапаны басқарудың бизнес құралдарын қолдану: зерттеу әдебиеттеріне шолу

**Түйін**

Зерттеудің мақсаты – жоғары оқу орындарында қолданылатын сапа менеджменті құралдары туралы қолданыстағы әдебиеттерді зерттеу және бизнес секторына бейімделген TQM маңызды факторларын анықтау. Зерттеудің негізгі бөлігі жоғары білімге қолданылатын бизнестің сапа менеджментінің ең танымал құралдарына арналған әдебиеттерге шолуға бағытталған.

Қолданылған әдіснама – кеңінен танымал «Web of Science Core Collection» деректер қорын қолдана отырып, зерттеу әдебиеттеріне шолу жасалды.

Қорытындылар. Ұсынылған зерттеу жоғары білім беруде сапа менеджменті құралдарын енгізудің тиімді тәжірибелеріне терең әдебиетті талдауды ұсынады.

Жұмыстың практикалық құндылығы – университеттің әкімшілігі және сапа менеджерлері оны өз ұйымдарында стратегиялық даму, университеттің тиімділігі мен сапасын жақсарту үшін қолданылатын сапалы техниканың таңдаулы нұсқаларын пайдалану үшін қолдана алады.

Жұмыстың өзіндік ерекшелігі – бұл аймақтық ғалымдар, зерттеушілер және университеттің менеджерлері үшін сыртқы мүдделі тараптардың (жұмыс берушілердің) қажеттіліктерін қанағаттандыру үшін сапаны басқарудың тиісті құралын анықтау үшін теориялық нұсқаулық бола алады.

*Түйін сөздер:* сапа менеджменті, сапаны жалпы басқару, сапаны басқару әдістері, әдебиетке шолу

# Применение бизнес-инструментов по управлению качеством в высшем образовании: обзорная литература

**Аннотация**

Целью исследования является изучение существующей литературы по инструментам управления качеством, применяемым в высшем образовании, и определение основных критических факторов TQM, адаптированных из бизнес-сектора. Основная часть исследования сосредоточена на предварительном обзоре литературы по наиболее известным существующим инструментам управления качеством бизнеса, применимым в области высшего образования.

Дизайн / методология. Исследовательский литературный обзор был проведен с использованием широко известной базы данных «Web of Science Core Collection».

Результаты. Представленное исследование предлагает глубокий литературный анализ эффективных практик по внедрению инструментов управления качеством в высшем образовании.

Практическая ценность статьи заключается в том, что администраторы университетов и менеджеры по качеству могут применять ее в качестве руководства при выборе лучших примеров методов качества, применяемых в их организациях для стратегического развития, эффективности работы университетов и повышения ее качества.

Оригинальность статьи заключается в том, что она может служить теоретическим руководством для региональных академиков, ученых, менеджеров и администраторов университетов с целью определения соответствующего инструмента управления качеством для удовлетворения потребностей внешних стейкхолдеров (работодателей).

*Ключевые слова:* управление качеством, всеобщее управление качеством, методы управления качеством, обзор литературы

## Introduction

Quality management of education has attracted significant attention in the academic community and business sector since 1995 when higher education institutions started acting as a provider or producer of quality education, while industry acting as a customer of the provided product (graduate). Accordingly, university administrative actors acknowledged the urgent need of searching for the most appropriate and applicable quality measurement instruments to preserve their competitiveness and position in the labor market. The literature states TQM as a joint process, encompassing all university units and faculties to improve the quality of educational services and graduates to satisfy the needs of students and employers. The significant key point of TQM is continuous improvement. However, every university department, administrative divisions, faculties should feel their contribution and engagement in the process of quality management and improvement since the unification of all individual members of the whole organization is the main responsibility of effective management.

Quality management is effective management of all processes within an organization, prevention of problems rather than failure detection. An appropriate quality measurement technique plays an increasingly crucial role in running a sustainable quality performance that is committed to the expectations and needs of potential stakeholders. University administration and faculty staff feel pressures of productivity challenges, organizational changes and quality compliance following European standards.

For so long, principles of TQM have been applied in manufacturing sector since the 1970s as a management philosophy, and with the rise of the concept ‘educational service’, ‘customer satisfaction’ in the field of education, HEIs began focusing on adaption of the most successful business quality techniques in their field to assure quality education.

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From the perspectives of policy, there is a growing discussion regarding the traditional model of university management. With the rising interest in quality improvement tools, an approach to higher education management has been reshaped from perspectives of quality management. Since the concepts of ‘quality’ and ‘quality management’ have become key backbones of university successful performance to face new challenges of globalization and high competition among HEIs at educational and labor arenas, managers of HEIs have realized the urgent need of reshaping their administrative structures to be more competitive, innovative, and self-managing.

Total quality management has been applied by many organizations worldwide since its first existence. As a rule, quality management requires the joint commitment of all actors within an organization and focuses more on “prevention rather than inspection”. According to features of TQM, internal actors of HEIs feel more committed to the whole quality assurance process, if university administrators attract them to decision-making processes and demonstrate their engagement. This will in its turn lead to trust, feeling of confidence and commitment. Marvin Bower (1903-2003), founder of McKinsey & Company in 1939 and considered to be the ‘father of modern management consulting’ stated the following: “a successful organization usually consists of a group of talented people who like and respect one another. The firm nurtures in its people the ambition and the determination to be outstanding at what they do. The firm encourages intellectual disagreement and interaction among its members but insists upon mutual respect. The firm tries to enable outstanding people to flourish by leveraging their skills and providing a creative environment. It never permits any relaxation of professionalism or high standard”. TQM is not only management; it is an approach of organizational change and behavior of actors within an institution. In the literature, the relationship between TQM and Leadership, Human Resource Management, Higher Education has been identified. Several authors outline the important role of leadership in assuring quality within an organization. In her study, Elham S.Hasham discussed assumptions of several scholars like David Ogilvy who was the ‘father of advertising’, an American businessman and writer Max De Pree and the ‘founder of modern management’ Peter Drucker. According to them, creativeness of organization members depends on the role of leaders, who could create favorable working conditions, as well as exchange of opinions within an organization by all members and creating business in consideration with customer’s needs, expectations play a significantly important role in successful quality management process [1].

***Historical overview to TQM***

The first cases of adaption of TQM in higher education report to US HEIs, almost 25 universities were reported to implement some elements of TQM. To some extent, there have been supporters and opponents of application of TQM in higher education. Some scholars argued that the terminology used by the manufacturing sector did not apply to higher education, for instance 'Student" defined as "customer". However, the appearance of external bodies like accreditation agencies responsible for quality assurance and quality improvements, as well as pressure from business sectors reformed the view of HEI managers and academics to quality management, as they mainly focus on quality. As evidence, the first open letter of six US companies forwarded to universities to collaborate in pursuit of quality improvement and practice of TQM in higher education to ensure the world competitive performance of the country. As a result, over 60 % of colleges adapted components of TQM in the US by 1992. Peter Redding (2005) discusses the issue of referring to students as 'customers, consumers or clients. However, there is a still rising pressure among scholars, concerning the application of business sector terminology in higher education in the framework of TQM adaption [2].

**Literature review**

There are plenty of articles written about implementation of principles of TQM in the higher education sector, as well as there is a growing research interest in TQM in Higher education [3]. Apart from organizations, there is a rising tendency among university managers and quality experts to implement elements of business quality management models and tools in the higher education field to improve the quality of education. To illustrate, the most widely used continuous improvement tool in the world, EFQM (European Foundation for Quality Management) Excellence Model [4], which allows assessment of current organization performance to define main strong and weak points of organization quality management, as well as the model enables an organization to identify a gap between the organization performance and achieved results. In addition to this, a new conceptual instrument designed to measure competencies of university graduates is discussed by Jim Allen, Ger Ramaekers and Rolf van der Velden. They assume that this model can serve as a significant tool for quality management in higher education [5].

Similarly, James D. T. Tannock outlined an approach based on principles of quality assurance and TQM, developed in industry, that is the Engineering Professors' Conference approach, which encompass issues of quality education, quality assurance requirements as well as quality procedures [6].

Initially, total quality management has been implemented as a continuous quality improvement tool by military, manufacturing, and service organizations in the USA in the late 1970s and 1980s in response to competition with Japanese high-quality products, techniques of quality control successfully applied by Japanese firms. Firstly, TQM was applied by the US Naval Air System Command in 1985 [7], and it was defined as 'a customer-oriented strategic and systematic approach to continuous improvement' [8]. Buchanan studied the movement of a continuous improvement approach from the military and manufacturing sector to the higher education field. Henceforth, apart from the business and industry sector, in the 1990s total quality management has shifted to the higher education sector, where the same problem of competition among the best and successful universities took place [8].

As a managerial approach, TQM has been adapted by many HEIs in developed countries. As it has been already mentioned, apart from the first pioneers (the US HEIs) of TQM implementation in higher education, UK higher education has practiced adaption of elements of TQM in its management system. As a result, they have benefited tremendously in terms of student performance as well as satisfaction with provided services and less cost for tuition. Gopal K. Kanji, Abdul Malek and Bin A. Tambi examined how principles and major concepts of TQM as important success factors can be measured to ensure a quality management tool for university managers in internal quality assurance of education. Finally, they have discovered that there is a positive relative correlation between the measurement of TQM principles and university successful performance [9].

Although this may be true, that principles of TQM can define key success factors of university performance, however the opponents of TQM argue that TQM does not cover all issues of higher education in terms of curriculum development, faculty time allocation as well as relationship between business, government, and management arrangements in the light of rising challenges of the competitive environment [10].

There are plenty of conducted theoretical and empirical research studies on the implementation of principles of TQM in industry and a growing tendency of academic interest in studying the role of TQM in higher education. To illustrate, a literature review discussing the application of TQM approaches in higher education of the US, UK and Australia has been conducted to identify existing quality management approaches [11]. Concerning

quality management tools, Mergen, E., Grant, D., Widrick, S.M. have studied and proposed quality management model which encompass 'design', 'conformance' and 'performance' of quality [12].

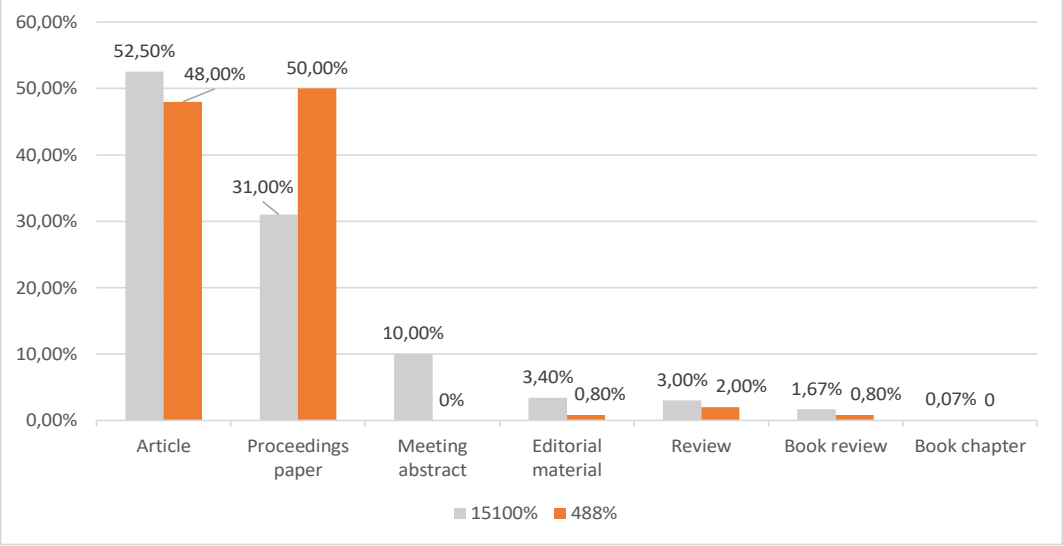
Matej, Matjaz, Damjan and another have claimed that another key point in effective quality management is considered to be the role of employees in quality management, their satisfaction level and their relationship with management [13]. In the case of higher education, it is worth to consider the interaction between key stakeholders (students, employers) and university management in successful quality management. Considering quality product, employees' role as a customer of HEIs contributes greatly to shaping quality graduates of universities [14].

This research paper attempted to investigate the range of studies dedicated to business quality management approaches applied in the field of higher education to understand properly what university management should consider during the quality management process.

**Methodology**

As the source for our literature review, a well-known, highly respected database "Web of Science Core Collection" database has been applied. Data from the Web of Science Core Collection database were collected in August 2019. The reason for selecting only this research source is that it is the most widely used among researchers and scientists for its leadership position in index citation, popular among 7000 subscribing institutions of the world, with 1 billion searchable citations in more than 250 disciplines. The first publication reported in the database dates to 1900. Besides, the collection of the best materials, which comply with all requirements of the core collection, illustrates the high quality and original materials. There are more than 127 000 journals, 70 000 books and 12 000 conference papers, reported in the database periodically monitored for quality. Thus, the study of the literature base of this database illustrates the valuable and quality results of our research.

Initially, we found 15100 documents by searching "quality management" in basic search "Title", which refers to the title of a journal article, proceedings paper, book, or book chapter, then we narrowed our search by adding "higher education" within provided results. After narrowing our search to the field of education, we acquired 488 publications in our data. The extracted publication types include proceedings paper, article, review, book review, editorial material, book chapters. Please see Figure 1.




Note - Source: based on own research

Figure 1 - **Segmentation of publications in "quality management" by types of documents**

The next level of our analysis focused on research areas. Before narrowing to the higher education field, 2931 records have been identified in the web of science categories related to management and business economics out of which only 165 documents have been regarding the field of higher education. This shows how little the issue of quality management in higher education has been studied worldwide. Please see Figure 2.

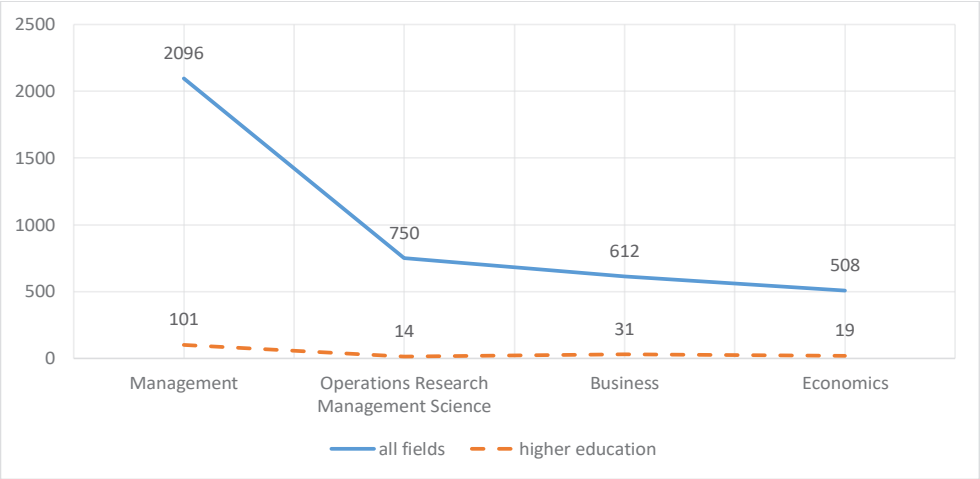



Figure 2 - **Segmentation of publications by categories**

The core of the research mainly focused on an exploratory literature review of the existing literature on the application of widely recognized business sector quality techniques in the field of higher education. The findings of the literature analysis are presented in the section "Research and Discussions".

**Research and discussions**

A considerable amount of research has been carried out about the role of TQM in enhancing organizational performance. However, in the emerging knowledge economy, the role of quality management in the higher education sector has attracted a significant number of scholars attention. Plenty of studies have been conducted related to the application of quality approaches in higher education. For instance, Cruickshank, M. has made a literature review on current quality management practices [11]. Today, TQM is no longer limited to industries, service, and business sectors. The principles of TQM have been successfully implemented in the higher education system of developed countries like the USA and UK, however, TQM implementation in developing countries remains least studied. The interest to principles of TQM in higher education is driven by growing competition among universities for quality graduates, as well as for maintaining a competitive advantage on academy and labor markets. Several scholars argue regarding challenges in the implementation of TQM principles in higher education. Some define these issues like lack of consensus on the definition of HEI customer, quality; others debate academic freedom and the unique nature of universities [15]. However, scholars suggest using other system approaches to overcome problems challenged by the application of TQM in higher education. System approaches focus on consideration of potential customers' and stakeholders' demands and requirements during business processes. Please refer to table 1.

Earlier Lawrence, P.R. declared that according to contingency theory, some elements of TQM can be successful in HE, whereas ineffective in the business sector or vice versa, as no theory or method can be successfully applied in all situations [20]. The study on identifying significant factors of TQM has been presented by Sahney, Sangeeta [15]. The reason why there is no unique consensus on the positive impact of TQM in higher education comes from the fact that TQM stresses nothing in HE in terms of quality product as in business sector, rather than it highlights the process of quality management and effective collaboration within an organization to reach a quality outcome.

It is worth to understand, that quality management is not only about the final product, but it is also continuous improvement of all activities of individuals within an organization. Application of principles of TQM in the field of higher education requires a redefinition of basic quality actors and processes of business organization. Please see table 2.

Based on a thorough literature review, this paper has identified major existing models of quality management widely used worldwide in the business sector and the higher education field.

European Foundation for Quality Management (EFQM) was firstly introduced in 1991. The European Quality Award started being awarded in 1992. Since its first publication dated to 2005, a total of 32 documents have been cited 112 times with average citation per item – 3.5. Most documents have been reported in the web of science categories "Management" and "Business", out of which almost one third comes to "Management". Slightly more than one-tenth of (4) items have been reported for the higher education sector.

Table 1 - **Literature sources and sample statements concerning quality management tools**

| Publication | Model, approach | The major issue of Higher education |
|---|---|---|
| Sirvanci, M.B. (2004) | Quality function deployment (QFD) | Joint program development with potential stakeholders and customers [16]. |
| Quinn, A., et al. (2009) | Six Sigma, Service Quality (SERVQUAL), ISO 9000, and TQM in HE | To improve performance in HE [17] |
| Venkatraman, S. (2007) | Educational management | process-oriented approach as a tool to increase productivity, decrease costs and improve quality of services [18] |
| Owlia, M.S., Aspinwall, E.M. (1997) | Literature review of Critical Success Factors and its application in higher education | Advantages of TQM in higher education – continuous improvement of educational services, students and staff members cooperation [19] |
| J.J. Lawrence, M.A. McCollough, (2004) | Classroom-based model of TQM. | Student satisfaction guarantees as a tool for implementing TQM principles in the classroom [20] |
| Cruickshank, M. (2003) | Current quality practices | Quality management practices in universities of US, UK, Australia revealed importance of cultural and organizational change for successful development of TQM [11] |
| Sakthivel, P. B.; Raju, R. (2006) | TQM 9- C EDEX Model | Identification of who is a customer in higher education.<br>The field of engineering in India [21] |
| Namish, M., Prakash, V. & Nitin, S. (2014) | Interpretive structuring modelling | 13 principles of TQM have been identified in engineering education to identify a hierarchy of actions to improve quality.<br>Quality mission, vision statement, top management commitment and visionary leadership should be given more attention for quality improvement [22] |
| Shams, S. M. Riad (2017) | A stakeholder focused TNE TQM model | Stakeholder orientation is recognized, as a significant consideration to enhance quality and their impact on the TQM process [23] |
| Sahney, Sangeeta (2016) | Analysis of the application of the SERVQUAL; quality function deployment (QFD); interpretive structural modelling (ISM); and path analysis. | Components of quality to develop TQM in higher education have been identified [15] |
| Habbal, F. M. N. & Jreisat, A. | Lack of understanding the importance of quality standardizations and focusing on repetitive rigid educational tools rather than focusing on innovative learning practices | Promoting quality culture, support continual learning, and quality incentives are playing key roles to over TQM implications, 4 different UAE based universities [24]. |

The most popular management tool has been reported the Balanced Scorecard (BSC) introduced by Kaplan and Norton in 1992. A measurement tool based on putting the strategy of an organization into practice by defining the cause-and-effect relationship of the provided product or service. The first interest in studying this technique dates to 1991, providing in a total of 1062 materials. To systematize our findings simpler, we have narrowed our findings within the web of science categories (mainly "management" and "business" fields of study) and acquired only half of total publications. The citation report demonstrates the highest interest of researchers, since the sum of times cited in the web of science core collections equals to 12740, each document averagely cited 21,93 times.

The Malcolm Baldridge National Quality Award (MBNQA) introduced in 1988 originally was awarded for excellence and quality achievement in the private sector of business, later in 1999, healthcare and education field were recognized for excellence and quality by the award. The focus of this technique is on continuous quality improvement of provided services/products, and continuous improvement of organizational performance. The findings of the literature review reveal only in total 9 records, out of which 8 discussed in management and business fields. 17 times have been cited total publications, each averagely 2,13 times. A single document has not been reported regarding the application of the Malcolm Baldridge National Quality Award (MBNQA) in higher education.

Table 2 - **Critical factors in business and higher education sector**

| Author | Critical factors in the business and industry sector | Higher Education (proposed by Author) |
|---|---|---|
| 1 | 2 | 3 |
| Saraph et al. (1989) | Role of top management and quality policy<br>Design of product and service<br>Supplier quality management,<br>Process management,<br>Quality data and reporting<br>Employee relations<br>Training<br>Role of the quality department [25] | Role of top management and quality policy<br>Content of educational programmes<br>Quality management of human resources and technical resources<br>Process management<br>Quality programme descriptions<br>University and employee collaboration |
| Anderson et al. (1994) | Visionary leadership<br>customer satisfaction<br>process management,<br>employee fulfilment<br>learning<br>continuous improvement<br>internal and external cooperation [26] | Strategic leadership<br>Students' satisfaction<br>Process management<br>Teaching staff fulfilment<br>Continuous learning<br>Continuous improvement of qualification<br>Cooperation |
| Flynn et al. (1994) | Top management support<br>Customer involvement<br>Process management<br>Product design<br>Quality information<br>Workforce management<br>Supplier involvement [27] | Administration support and assistance<br>Student and employer engagement in the development of educational programs<br>Development and description of educational programs (program descriptions and module handbooks at websites)<br>Transparency and openness<br>Workforce management<br>Teaching staff engagement in programs development |
| Black and Porter (1996) | Corporate quality culture<br>Strategic quality management<br>Customer satisfaction orientation<br>Communication of improvement information<br>People and customer management<br>Supplier partnerships<br>Operational quality planning<br>Quality improvement measurement systems<br>External interface management<br>Teamwork structures [28] | Corporate quality culture – a shared value and collective responsibility of all individuals of organization, including students, teaching staff, employers and administrative staff<br>Strategic quality management<br>Student satisfaction orientation<br>Faculty and stakeholder engagement in the quality management process<br>Quality planning and monitoring<br>Quality improvement measurement systems<br>External assessment procedures (accreditation agencies) |
| Ahire et al. (1996) | Top management commitment<br>Customer focus<br>Design quality management<br>Product quality<br>Internal quality information usage<br>Employee involvement<br>Employee empowerment<br>Supplier quality management<br>Supplier performance<br>Employee training<br>Benchmarking<br>Statistical process control usage [29] | Top management commitment<br>Student focus<br>Design internal quality management<br>Quality degree programs<br>Internal quality management<br>Involvement of employees in developing degree programs<br>Quality faculty staff management<br>Faculty staff performance in terms of teaching and research<br>Training of teaching staff<br>Benchmarking, participation in rankings<br>Annual university report about university performance in all aspects of education |

| 1 | 2 | 3 |
|---|---|---|
| Rao et al. (1999) | Top management commitment<br>Customer orientation<br>Product/process design<br>Quality information availability<br>Quality information usage<br>Supplier quality [30]<br>Employee training<br>Strategic quality planning<br>Quality citizenship<br>Internal/external quality results<br>Benchmarking | Top management commitment<br>Student orientation<br>Design and development of degree programs<br>Quality description of degree programs at the homepage of the university<br>Quality faculty staff management<br>Faculty staff performance in terms of teaching and research<br>Strategic quality planning<br>Internal/external quality results<br>Benchmarking, participation in rankings |
| Bayraktar et al. (2008) | Leadership<br>Vision of HE<br>Student focus<br>Another stakeholder focus<br>Process design and resources<br>Measurement and evaluation | - Employee involvement<br>- Recognition and award<br>- Education and training<br>- Quality system improvement<br>- University leadership [31] |

Firstly, introduced in 1987, revised in 1994 and 2000, the ISO 9000:2000 covers quality management and quality assurance standards; ISO 9001:2000, designed for a quality management system; ISO 9004:2000, a guide for continuous improvement of a quality system. Totally 1402 documents were reported, 14 % (196) have been refined by management and business categories. The sum of times 196 publications cited is 2 686, each cited 13,7 on average. The first publication dates to 1984, however, only from 1994 there was a marginal upward trend in the number of citations, which indicate moderate growing interest to the study of this management instrument. In 2018, the trend reached a peak. When the search has been specified to higher education, the research revealed only 4 documents cited 11 times, each 2,75 on average. The findings of the review demonstrate that only from 2013, there has been an unstable trend of the research on the application of ISO quality tools in the field of higher education.

As for the following quality measurement tool - launched in the early 1990s, management in terms of bringing change in performance in cost, quality, and customer satisfaction, 'Business process re-engineering', 144 publications in total have been found. Half of them have been sorted following categories. Total citation is 620. 8,61 average citations per item. Unfortunately, the search for publications in higher education has not provided any reports, which demonstrates either the lack of study on the application of BPR management tool in HEIs to achieve dramatic improvements in organization performance or no evidence of adopting a business model in higher education.

The most widely used service quality measurement technique developed by Parasuraman et al. (1988), is used to identify a gap between customers' expectations and perceptions to provide quality improvement. However, the findings showed in total 248 documents recorded, out of which 138 have been sorted by categories, cited 12541 in total, in average 90,88 citations per item. When the results were refined to higher education, less than one-twentieth (19) have been recorded, while another quality technique 'Six Sigma' has been applied slightly more than one-tenth (22) of total 730 records. Sum of times cited – 152, each cited 8 times on average.

The first implication of 'Six Sigma' tool dates to the early 1980s. This approach enables organizations to focus more on customers' requirements through analysis and data gathering to eliminate costs without adding any value to customers. It attempts to provide better, faster, and cheaper products and services to customers through managing processes. In total 1907 recorded documents. 730 refined for management and business categories, cited in total 7499 times, each in average 10,27. When the search was specified to higher education, 22 findings with 113 sums of times cited, were available. Average citation per item is 5,14. (See table 3 - Results of qualitative literature analysis).

As can be seen from the graph, the most widely used quality tool of process improvement for customer satisfaction comes to the application of 'Six Sigma model' and a management tool 'Balanced Scorecard', whereas the most significant decrease in the table is in 'EFQM'. There is an inverse correlation between publications in all quality management techniques in "Management" and "Business" categories compared to the information given for "Economics" and "Operation Research Management Science", except for model formed by fourteen chief executives of leading European companies – 'EFQM' and a quality award established by the US Congress – 'MBNQA', with no data recorded in "Economics" category.

Table 3 – **Results of qualitative literature analysis within the web of science categories «Management» «Business», «Economics», «Business Economics», «Education Educational Research»**

| Model | Total number / Categories | Citation in total / in higher education | Number in Higher education |
|---|---|---|---|
| European Foundation for Quality Management (EFQM) | 32 / 15 | 84 / 8 | 4 |
| Balanced Scorecard (BSC) | 1062 / 549 | 12587 / 71 | 19 |
| Malcolm Baldridge National Quality Award (MBNQA) | 9 / 8 | 17 / - | - |
| The ISO 9000 standards | 1402 / 196 | 2686 / 11 | 4 |
| Business Process Re-engineering (BPR) | 144 / 72 | 620 / - | - |
| SERVQUAL model | 248 / 138 | 12541 / 152 | 19 |
| Six Sigma | 1907 / 730 | 7499 / 113 | 22 |
| Note - Compiled based on author's own research | | | |

The information presented in Figure 3 shows the number of publications on various types of quality models implemented in the business sector in a selection of web of science categories from 1990 until 2018.

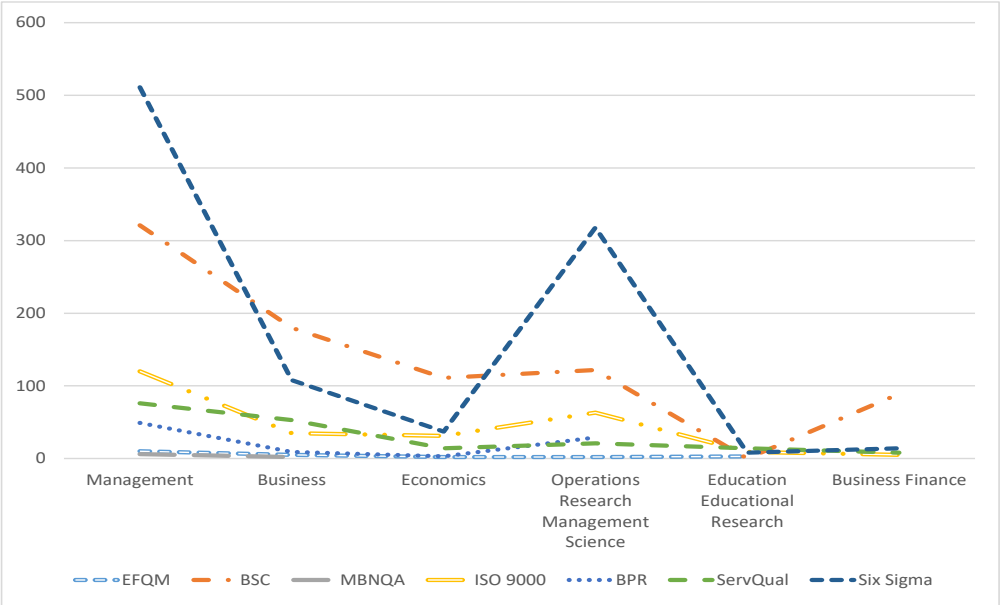



Figure 3 - **Number of publications in segmentation of web of science categories**

Note -Compiled based on author's own research

As shown in the graph, 'ISO 9000' is the third most popular quality management tool, developed by the International organization for Standardization.

Since service quality research is a new phenomenon in the higher education field, the practice of using the 'ServQual' model as a quality tool in education is reported rarely. As a piece of evidence, the figure demonstrates only 22 per cent of publications (186 documents) found in the database in comparison to the Balanced scorecard (823 records). However, the first mention about a discussion of quality models dates to 1991, the publications on the application of 'ServQual' and 'BSC' models (See Figure 4).

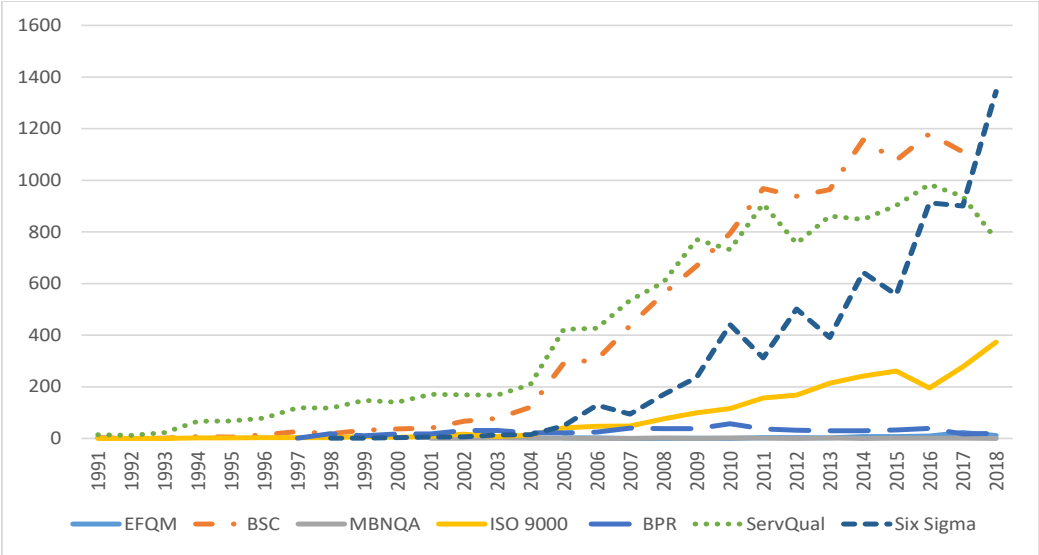



Figure 4 - **Citation Report of publications in all categories within «Management» «Business», «Economics», «Business Economics», «Education Educational Research» categories**

Note - Compiled based on author's own research

The least practice of adapting the quality tools of the commercial sector accounts for 'MBNQA', only 12 items recorded. This, in turn, demonstrates less interest in implementing some quality measurement tools in the higher education sector.

The common trend of presented data is that many of the research studies have been recorded in "management" field of study. Please see Figure 3.

To begin with a citation trend of publications in quality management tools, there was a steady rise starting from 2004. As can be seen from figure 4, citations for publications in "Six Sigma" fluctuated moderately and reached its peak in 2018 keeping back other types of quality models. At the same time, citations for documents in "ServQual" recovered dramatically in 2011 after moderate fluctuations and declined steadily in 2018.

An interesting fact about this graph is almost no citation data is reported for "BPR" against a backdrop of publication citations on "ServQual", "BSC" and "Six Sigma".

Despite popularity of ISO standards in businesses touching all types of business and all aspects of daily life, as well as even with existence of several versions of ISO standards revised several times (9001, 9002, 9003) to be applicable to any type of organization, information presented in the graph shows a lack of interest in studies of ISO standards applications.

To summarize the given graph, there is a growing tendency of interest among researchers and academics in studying practices of implementing the best quality management approaches. Please see figure 4.

Despite challenges of TQM implementation in the industries, many HEIs have committed themselves to the application of quality management techniques popular in the business sector in their quality management processes to ensure high quality educational services to potential stakeholders. Like a shred of evidence, the given figure 5 presents data about how publications on the application of quality management tools in higher education are cited from 1990 to 2018, as well as to demonstrate the significant importance of studying the applicability of business quality management models in the higher education field. However, the first citation for application of quality management tools in higher education dates to 2001, which demonstrates that adaption of business practices in quality management, is rather a new phenomenon of the XXI century. University managers have already realized the fact that the implementation of quality management systems in an organization enables to manage and improve the quality of the organization's products and processes.

As can be seen from the graph, the significant point of the graph is that the first citation report has been recorded for 'ServQual' quality measurement tool in 2010 among the rest. However, until 2013 there was an uneven rise and decline in the frequency of citation, and only in 2015, the citation trend recovered dramatically.

Whereas the latest reference to the application of a quality model in 2013 comes to 'Six Sigma' and 'ISO 9000' quality models. There were fluctuations in the number of a citation for 'Six Sigma' and 'ISO models' between 2013 and 2018. Even though, an abrupt rise in citation frequency of publications in a discussion of Six Sigma model has been reported in 2018.

From the first figure, it was clear that the number of publications on 'EFQM' was recorded significantly less. The same with citation report illustration, which demonstrates a plateau since the first appearance of publication on the web of science and only marginal rise is documented in 2017 for the whole recorded 21 documents in comparison to previous years since 2015.

Regardless of less cited times for 'MBNQA' quality instrument, the first citation is documented in 2001.

The trend for 'BSC' remained constant between 2011-2015. There was a steady recovery in the citation only in 2017; however, there was a moderate fall in the citation data.

Overall, the findings of our research reveal that further deep studies discussing the practical implementation of business quality techniques in education are vital for the academic community to define an appropriate quality tool in quality management and improvement of education. Adoption of the best practices from the business sector with a customer-focused approach (student-oriented approach) can lead to competition among universities, which in its turn will be prerequisite for the quality of provided educational services. Please see Figure 5.

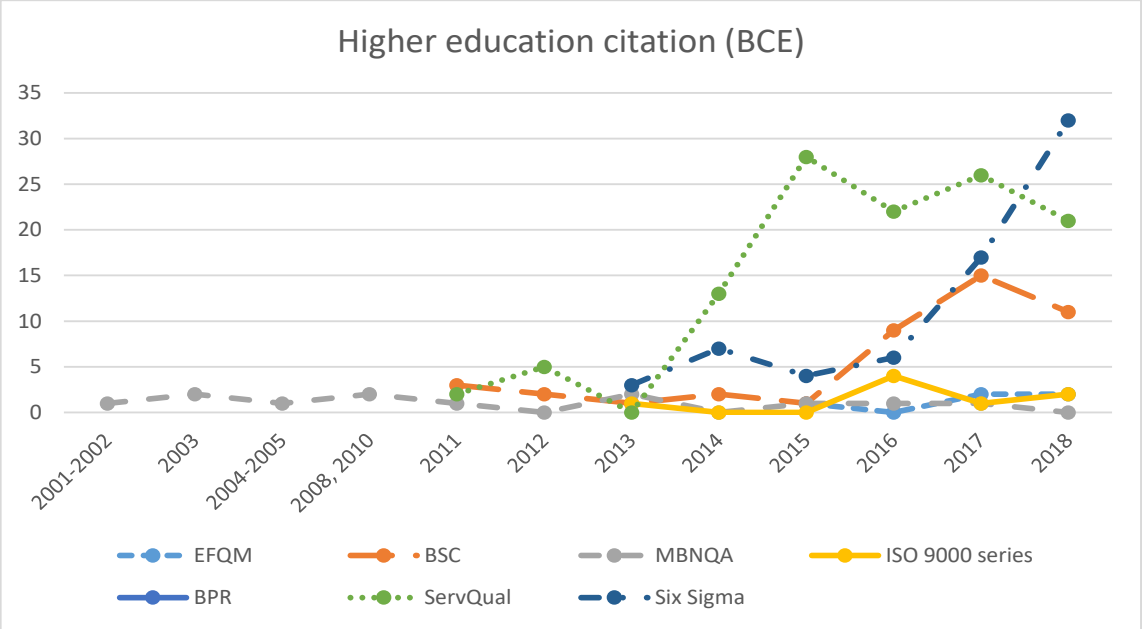



Figure 5 - **Citation Report of publications in higher education within «Management» «Business», «Economics», «Business Economics», «Education Educational Research» categories**

Implementation of quality management tools in higher education requires a deep study of the best practices. This study presents a literature review of successful practices of implementing quality management models in organizations as well as in higher education. The findings of this study can serve as a guideline for university managers to select the best evidence of management tools to apply in their institutions for organization development, university performance and quality improvement. In the same manner, this literature review indicates that applying organization management tools relevant to the HEIs mission and goal has become a strategic approach for university management in the current competitive environment. This research addresses the issue of how to choose the best management tools to effectively achieve excellence achievement and key stakeholders' satisfaction.

## Conclusion

We are aware that our research may have some limitations. Firstly, there is still some considerable research required to be conducted. This paper is a preliminary attempt to identify the frequency of adapting business quality models in higher education based on the Web of Science core collection.

The second is from a practical point of view, the further research identifying critical success factors of TQM and defining the best practice of quality management tool in Kazakhstani universities is essential for the practical value of the discussed issue.

There is a school of thoughts arguing the applicability of industry quality techniques in higher education, as they claim that academics do not depend on the needs of the market, while

industry focuses more on the requirements and expectations of the customers (Owlia & Aspinwall, 1997). In this regard, before the application of the appropriate industry quality technique in quality management of higher education, proper study and analysis should be carried out, so that cross-application of business quality techniques in higher education to be referred to administrative body of HEIs, rather than learning and teaching process.

Despite limitations of this research, we still believe that findings of the literature review demonstrate that there are higher education institutions applying business models in their quality management processes.

Taken together, the results of this study support the idea that adaption of business quality techniques in higher education sector enables not only quality recognition, as well as quality models serve as the best-practice tools for implementing excellence strategies, for self-assessing of organizational performance, benchmarking and finally for providing quality education services to potential customers. Another key point of implementing business quality techniques in higher education is continuous self-assessment and measurement of organization process improvement. Criteria of techniques allow to measure organization performance and to identify the rooms for improvement and opportunities to eliminate them.

Social implications of the research are that it addresses the issue of how to choose the best management tools to effectively achieve excellence achievement and successful performance in educational and labor markets to assure quality education to the society and key stakeholders.

Considering the findings, the paper can serve as a guideline for prospective university managers and administrators to define appropriate quality management tool to reshape their organizational structure to assure quality.

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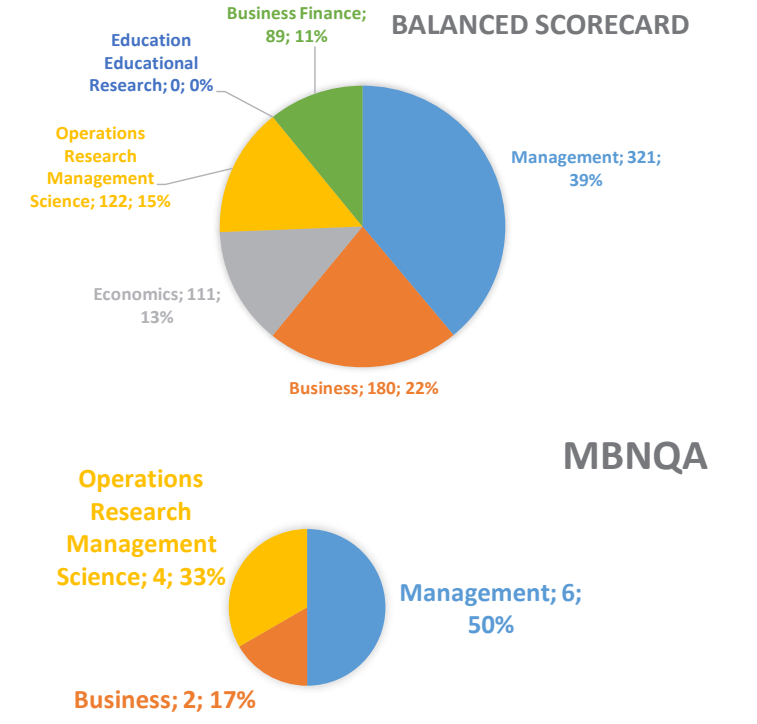
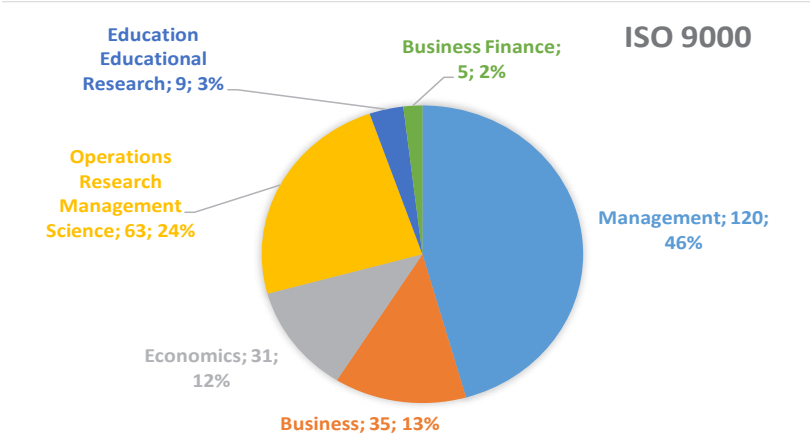
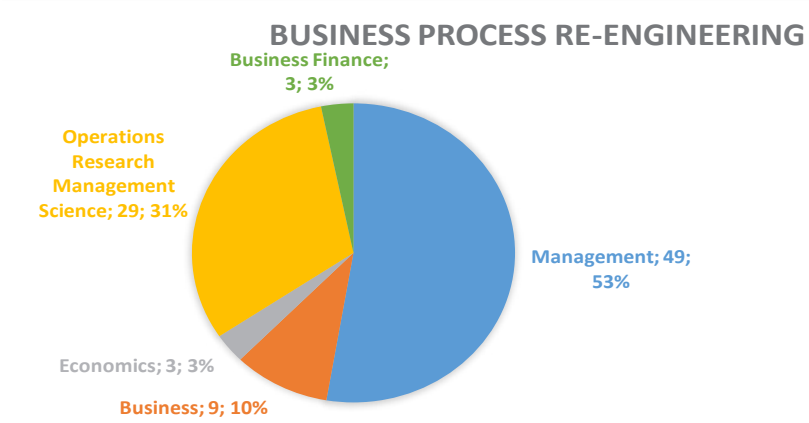
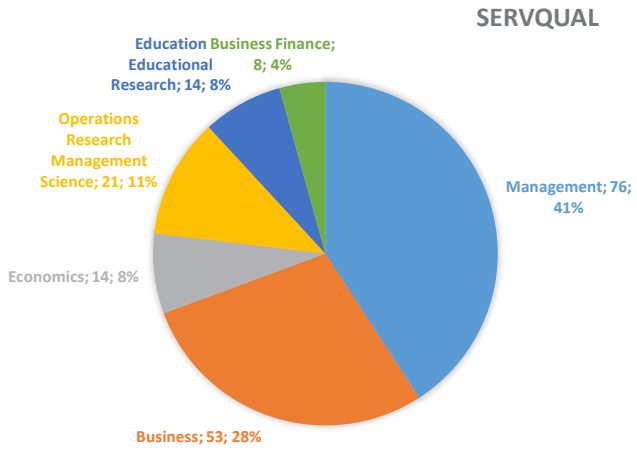
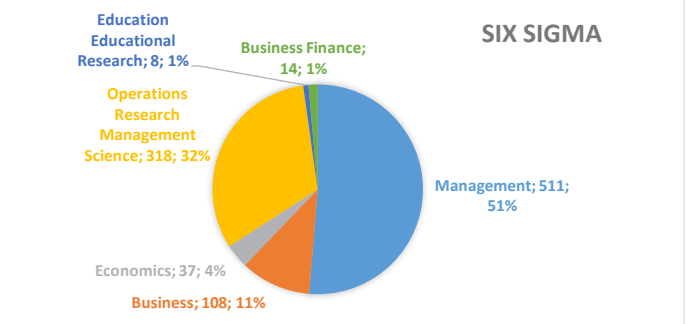
Appendix – Total publications on quality measurement techniques in the web of science categories




ISO 9000
Education Educational Research; 9; 3%
Business Finance; 5; 2%
Operations Research Management Science; 63; 24%
Management; 120; 46%
Economics; 31; 12%
Business; 35; 13%


BUSINESS PROCESS RE-ENGINEERING
Business Finance; 3; 3%
Operations Research Management Science; 29; 31%
Management; 49; 53%
Economics; 3; 3%
Business; 9; 10%


SERVQUAL
Education Educational Research; 14; 8%
Business Finance; 8; 4%
Operations Research Management Science; 21; 11%
Management; 76; 41%
Economics; 14; 8%
Business; 53; 28%


SIX SIGMA
Education Educational Research; 8; 1%
Business Finance; 14; 1%
Operations Research Management Science; 318; 32%
Management; 511; 51%
Economics; 37; 4%
Business; 108; 11%

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