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Analysis of the Relationship between University Total Quality Management Requirements and the Deming Cycle for Continuous Improvement, An Exploratory Study of Faculty Members' Opinions at Zakho University

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Abstract

Through the current study, we address two highly significant topics that many organizations in general, and higher education institutions in particular, strive to adopt for their role in achieving desired success and distinction. These topics are the requirements of Total Quality Management for higher education institutions and the Deming cycle for continuous improvement. The study involves investigation and analysis through surveying the opinions of faculty members in various colleges at Zakho University, using a questionnaire prepared for this purpose. The aim is to ascertain the presumed relationship between these two variables. Through description, diagnosis, and analysis of correlation and influence relationships, the study arrived at results that formed the basis for important conclusions. These conclusions served as a genuine starting point for providing a number of necessary recommendations for the researched university and all its colleges, as well as for similar universities and colleges.

***Keywords*:** University Total Quality Management; Deming cycle; Continuous improvement.

1.Methodology

1.1. Problem Statement and Causes

Higher education institutions, represented by universities, colleges, and institutes, play a crucial role in providing the community and both public and private sectors with graduates in line with the required specializations for the labor market. They also offer experiences, consultations, and research to enhance societal development and prosperity.

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Furthermore, continuous improvement is the key tool for developing and enhancing the outputs of higher education, which must align with the rapidly evolving needs of the labor market. This motivated us to address both the requirements of Total Quality Management for higher education institutions and the Deming cycle for continuous improvement, and to assess the degree of compatibility and integration between them at the researched university, the study illustrated the following questions:

1. Does the researched university have a clear vision of the university comprehensive quality management requirements and its field importance?

2- Are the elements of the Deming cycle one of the options presented to the university under study to improve its performance?

3- To what extent are the requirements of comprehensive quality management for higher education institutions and the elements of the Deming cycle for continuous improvement available and applied at the investigated university?

4- What are the most and least available requirements, and what are the most and least adopted elements in the researched university in order to support and enhance them?

5- What is the level of integration achieved between both university comprehensive quality management, with its basic requirements, and the Deming cycle, with its necessary elements achieved to distinguish the researched university from its peers from similar universities?

1.2. Significance of the Study

The primary significance of the current study revolves around two fundamental axes, represented by the following:

1. **Theoretical Significance**: Making a serious contribution to providing a theoretical framework and philosophical framing for both Total Quality Management for continuous improvement with its necessary elements and the Deming cycle to enhance an important field of knowledge in the realm of higher education institutions.
2. **Field Significance:** Investigating and analyzing the presumed relationship between both Total Quality Management requirements for continuous improvement in an important field of knowledge, which serves as a fundamental indicator for the prosperity of societies, and the elements of the Deming cycle to assess the practical integration between them and subsequently provide a field-analytical study that serves the researched university and similar universities.

1.3. Study Objectives

Based on the presented problem statement, its causes, and its theoretical and field significance, this study aims to achieve a core objective represented by analyzing the integrative relationship between both Total Quality

Management for higher education institutions and the elements of the Deming cycle for continuous improvement. Additionally, it aims to i

investigate the possibility of integration and alignment between them at Zakho University, alongside achieving the following objectives:

1. Defining the researched university through its faculty members' perspectives on the necessary requirements for adopting Total Quality Management in higher education institutions, its key objectives, orientations, contents, implementation obstacles, and remedial measures through presentation and analysis. Additionally, outlining the essential elements for implementing the Deming cycle for continuous improvement in the field of higher education by adopting its core components.

2. Researching, analyzing, and interpreting the relationships of correlation and influence after describing and diagnosing both the requirements of Total Quality Management for higher education institutions and the elements of the Deming cycle for continuous improvement at Zakho University. This will illustrate the extent of integration and alignment between the study variables.

3. Identifying the most available and applied requirements for Total Quality Management relevant to higher education institutions, and earnestly striving to enhance them, as well as identifying the least available requirements to pinpoint the causes for potential remediation and improvement of their application.

4. Identifying the principles relied upon in the application of the elements of the Deming cycle at the researched university and assessing their compatibility with the content of continuous improvement. This includes enhancing them towards their effective utilization for developing the performance of the researched university in line with the requirements of University Total Quality Management as a whole.

1.4. Theoretical Study Model

In accordance with the problem statement, its causes, significance, and objectives, the study adopted a theoretical model representing the presumed relationship between the study variables in one direction, as indicated in Figure 1.

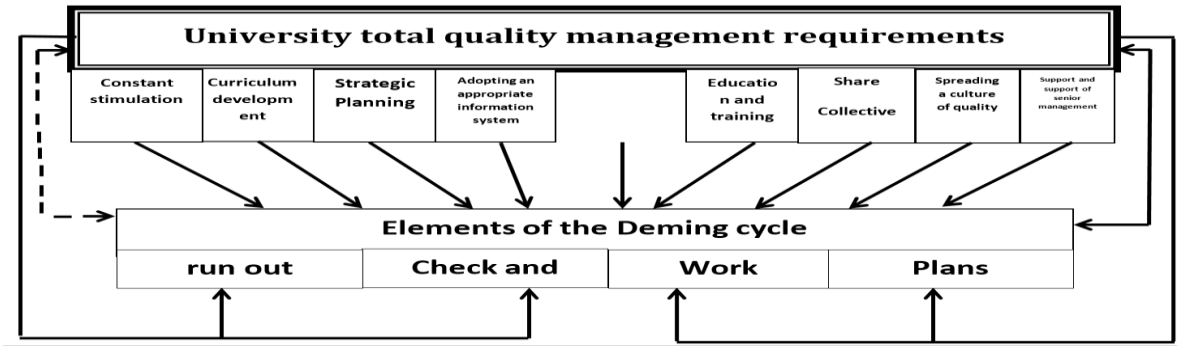

Figure 1

1.5. Study Hypotheses

In order to methodologically address the problem of the study and its causes in light of its theoretical framework and field contents, the study adopted a number of main and sub-hypotheses as follows:

First Main Hypothesis:

There is a significant correlation between the requirements of Universities Total Quality Management and the Deming Cycle for continuous improvement at the overall level in the researched Zakho University.

Second Main Hypothesis:

There is a significant correlation between the requirements of Universities Total Quality Management and the Deming Cycle for continuous improvement at the partial level in the researched Zakho University.

Third Main Hypothesis:

There is a statistically significant impact of the requirements of Universities Total Quality Management on the elements of the Deming Cycle for continuous improvement at the overall level in the researched university.

1.6. Data Collection Methods

In completing the theoretical aspect of the study, we relied on scientific references from recent studies, sources, journals, theses, dissertations, and conferences, in addition to scientifically reputable websites on the international internet. As for the field aspect of the study, it primarily relied on a questionnaire prepared to measure and evaluate the opinions of the researched gentlemen regarding both Universities Total Quality Management with its necessary requirements and the Deming Cycle for continuous improvement with its core elements, based on the sources mentioned in the theoretical aspect of the study. Moreover, interviews were conducted with the researched gentlemen to clarify questionnaire items, inquire, or request explanations about the study variables whenever necessary, along with the descriptive guide of the university to describe the researched field.

1.7. Study Boundaries

The current study boundaries are represented as follows:

1- Objective boundaries: Requirements of Total Quality Management for Higher Education Institutions and elements of the Deming Cycle for continuous improvement.

2- Spatial boundaries: Zakho University and its affiliated colleges.

3- Temporal boundaries: The study period extended from September 1, 2023, to March 1, 2024.

4- Human boundaries: Represented by the faculty members in the colleges of Zakho University.

2. Total Quality Management in Higher Education / Theoretical Background

2.1. Introduction to Total Quality Management in Higher Education

Universities, through their various colleges, represent the fundamental infrastructure of higher education, playing an active role in providing outputs that meet the demands of the job market. This is achieved by developing the human resources and enhancing their cognitive, cultural, and skills capacities through the knowledge and skills they acquire from higher education institutions. Consequently, they contribute to the advancement and prosperity of countries.

Total Quality Management (TQM) is a management philosophy that relies on scientific management methods and tools, in addition to leveraging creative efforts and excellent skills to deliver the best and continuously improve upon it whenever possible. This is in line with the rapid changes in the external environment and the intensification of competition, making quality the most important standard in all activities and tasks of organizations alike "The authors in [8,9]".

With the increasing benefits achieved through the implementation of Total Quality Management (TQM) requirements, whether through quality improvement, increased productivity, cost reduction, defect reduction or elimination, and higher returns, there has been a rise in employee wages, provision of their necessities, and consequently, an increase in their loyalty and satisfaction with their organizations. This philosophy has transitioned to service organizations, making higher education institutions in advanced countries more eager to successfully implement TQM requirements. This has spurred other countries to adopt these requirements to provide outputs of suitable quality for the demands of the job market, society, and all beneficiaries, including outstanding graduates. Japan exemplifies this during its post-World War II occupation period, both academically and technically, by relying on higher education institutions such as colleges, institutes, universities, and research institutions to deliver the best and excel as a cornerstone of academic superiority over those who surpassed them militarily. Consequently, Japan provided the job market with distinguished personnel capable of improving the harsh reality it faced, as it scientifically planned to achieve. "The authors in [13,22]".

2.2. Concept of Total Quality Management in Higher Education

Total Quality Management (TQM) in higher education, according to "The authors in [20,21]"., is defined as a system consisting of the interaction of inputs represented by faculty, students, administration, curriculum, classrooms, and laboratories to achieve a high level of efficiency and effectiveness at the lowest cost. This is aimed at continuous scientific and cognitive improvement of the quality of educational outputs, with the objective of satisfying beneficiaries and all relevant stakeholders.

According to "The authors in [31,23]"., the quality of educational service is defined by focusing on the university's outputs, specifically the students, by preparing them with specific characteristics and traits accurately. They are not just recipients or conveyors but rather interact with information, knowledge, and skills.

Additionally, "The authors in [6,27]". views Total Quality Management in higher education as representing distinction, measurement, and earnest efforts to satisfy the needs of current and prospective students and beneficiaries. This is achieved through mechanisms derived from societal needs, pushing towards roles, tasks, and duties with the highest precision to achieve the goals of all beneficiaries of the educational process.

In the same vein, "The authors in [25,20]".emphasizes the adoption of quality in education and the necessity of its improvement as a scientific and managerial approach aimed at the efficiency of higher education. It aims to provide suitable environments for students to obtain their university degrees and for professors to deliver their best research and consultations to serve all members of society equally. "The authors in [22,26]". and "The authors in [30,31]".define Total Quality Management (TQM) in education as the degree to which the needs of students and other participants are met and their expectations continuously exceeded. TQM in the education sector aims for continuous improvement by assigning all university or college employees the responsibility for quality improvement (quality is everyone's responsibility), increasing productivity, and reducing costs to achieve customer satisfaction. TQM in service organizations emphasizes two fundamental aspects: customer satisfaction and the participation of all employees.Moreover" The authors in [15,24]".believes that the contents of Total Quality Management, consistent with its application trends in higher education, highlight it as an organizational philosophy that provides a suitable environment to achieve the targeted quality of educational processes. It also provides for the establishment of a qualitative system for outputs with competitive characteristics and contributes to involving all organizational formations in university planning, execution, and monitoring tasks according to renewed performance standards. Furthermore, it focuses on improving the performance of university activities and understanding the aspirations of beneficiaries of university services, regardless of their nature.In the same vein, "The authors in [14,29]".confirms that the quality of higher education, from the perspective of Total Quality Management, involves improving the performance of universities by adopting a number of characteristics and features of the educational product that are capable of meeting the requirements of graduates and serving the needs of all stakeholders. This is achieved through directing and harnessing the tangible and intangible resources of the university, as well as providing suitable environments and conditions for creativity and innovation, thereby enabling students to achieve the highest targeted levels of quality.

From the preceding discussion, it is evident that Total Quality Management in higher education is a culture of excellence that must be disseminated, applied, supported, and reinforced by university administrations. Ensuring proper implementation of its requirements becomes the responsibility of all stakeholders in the educational process, including management, employees, internal and external customers, beneficiaries from the job market, and all members of society.

2.3. The Importance of Total Quality Management in Higher Education

"The authors in [9,28,17,27,4] all emphasize the significant importance of Total Quality Management in the success and development of organizations. Through Total Quality Management, an organization can achieve improvements in its capabilities and competitive edge, thereby increasing its intrinsic and material value through the added value it generates.

1- Implementing Total Quality Management leads to improvements in the quality of outputs, allowing the organization to distinguish itself. The essence of Total Quality Management lies in doing things right from the outset and every time, by applying this principle across all activities and tasks of the organization. Consequently, it results in cost savings, time efficiency, and increased effectiveness and efficiency of the organization.
2- Increasing organizational effectiveness: Total Quality Management enhances teamwork and improves communication among employees, thus involving them in problem-solving and fostering better relationships between management and employees. This leads to increased returns, higher job satisfaction, and organizational loyalty.

3- Achieving customer satisfaction: Total Quality Management focuses on identifying the needs and requirements of customers, retaining them, and designing outputs that are compatible with continuous changes while minimizing costs and offering competitive prices. In the same vein, "The authors in [5,6]".emphasizes that Total Quality Management is a fundamental approach to fully improving the effectiveness, flexibility, and efficiency of business operations. The correct path to distinguishing an organization's performance lies in the active participation of all parties, including departments, activities, and individuals at all levels, in implementing the requirements of Total Quality Management in higher education.Referring to "The authors in [25,27]".the importance of quality in higher education is highlighted through its role in achieving countless objectives in the realms of construction, development, and prosperity. This importance is broadly manifested across various sectors that rely on the outputs of higher education to fulfill their tasks and achieve their goals, whether they are scientific, student-oriented, service-oriented, or in applied and social sciences. Additionally, higher education institutions contribute significantly by providing numerous research, services, and consultations aimed at adopting various societal trends.

In the same vein, "The authors in [22,13]".emphasizes that the focus on the quality of higher education revolves around the following:

1- The products of universities with their various faculties represent some of the rarest and most valuable commodities in all societies. This is because the success of non-educational organizations is achieved through the provision of outputs from universities with specific characteristics, specialties, and successful and distinguished qualifications.

2- Due to the high funding allocated to higher education from the state budget, as it stands at the forefront of important social activities, it is imperative to increase focus on the quality of performance of these institutions to maximize the return on investment in this sector.

3- Many developing countries have undertaken the expansion of education as a fundamental factor in development. However, this has sometimes led to the compromise of certain quality standards, resulting in a weakening of the preparedness of many graduates.

4- There is a growing global academic interest in the development of new knowledge of quality, prompting

researchers to focus on quality both theoretically and empirically.

2.4. Objectives of Total Quality Management in Higher Education

The precise field applications of the requirements of Total Quality Management in higher education achieve numerous objectives, benefiting university management, faculty members, staff, graduates, the job market, and society as a whole. The key objectives revolve around:

1. Achieving student satisfaction and building their confidence in their educational institutions.
2. Instilling pride in students for their affiliation with their colleges and universities.
3. Efficient utilization of university resources for the benefit of the educational process.
4. Developing the human resources capabilities of the educational institution through continuous improvement.
5. Promoting a culture of quality as everyone's responsibility.
6. Instilling ethical values of teamwork and self-reliance to achieve an advanced position for the university.
7. The realized development in the performance of the university's outputs in the job market acts as an attraction for both students and affiliates, positioning it as a pioneering academic institution.
8. The university's serious contribution to laying the foundations for the society's scientific development and responding to the needs of the market and graduate students theoretically and practically.
9. Developing the knowledge, skills, and capabilities of students in accordance with scientific principles to meet the needs of stakeholders benefiting from graduates.
10. Ensuring the quality of the educational, research, consulting, and service processes throughout the university.
11. Increasing the university's productivity by developing the capabilities of graduates upon entering the workforce.
12. Ensuring comprehensive improvement at all levels in higher education institutions.
13. Clarifying the roles of all parties in the success of the educational process, motivating them to contribute clearly towards improvement.
14. Ensuring the quality of the educational process through serious contributions from all relevant parties.
15. Fulfilling the social responsibilities placed on the university towards society and its citizens to contribute to nation-building.
16. Embedding a culture where everyone works diligently to serve others with precision and objectivity.
17. Reducing unnecessary expenses and increasing added value, whether in educational, consultancy, or developmental outputs, benefiting all parties and achieving positive returns for everyone involved.
18. Promoting a culture of preventing errors before they occur, thereby reducing the wasted time and ensuring continuous improvement towards excellence.

2.5. Components of Success in Implementing Quality in Educational Institutions

According to The authors in [6,17]"., as well as The author in [2]"., the successful implementation of Total

Quality Management (TQM) requirements in higher education institutions requires the adoption of fundamental components upon which subsequent achievements are based. These components include:

1. Establishing criteria and indicators to evaluate the quality of institutions and educational programs.
2. Having a guide to new best practice standards to ensure academic quality.
3. Providing a guide outlining the requirements of the job market.
4. Developing a clear vision and goals for various academic and administrative entities within the university.
5. Formulating a comprehensive strategy for implementing quality in the educational institution.
6. Promoting cooperation, participation, and interaction among all employees in the educational institution with the quality assurance department.
7. Enacting legislation that encourages and facilitates quality work.
8. Providing the necessary resources for implementing comprehensive quality.
9. Educating and training employees in the field of quality and all faculty members.
10. Ensuring the university or college management's focus on the quality of the basic educational process inputs, the educational process itself, and all its outputs.
11. Prioritizing the safety and quality of educational programs "The author in [28]".

2.6. Requirements of Total Quality Management in Higher Education

Total Quality Management (TQM) represents both a philosophy and a system that organizations in general, and higher education institutions in particular, must adhere to based on scientific principles and the necessary requirements for proper implementation. In this field, most authors and researchers agree that the most important requirements of Total Quality Management applicable to higher education institutions can be summarized as follows:

(Support and endorsement of senior management, dissemination of a culture of quality, participation, curriculum development, responsiveness to stakeholders, adoption of an appropriate information system, strategic planning, education and training, continuous motivation). Researchers such as The authors in [22,20,9,12,31,13,6]". have endorsed these requirements based on their importance and relevance to the current study.

A. Support of senior management

"The authors in [12,15]".emphasize the necessity of having a shared vision between the university's administrative leadership and faculty members regarding what quality is and its requirements to establish and implement Total Quality Management (TQM). Faculty members play a crucial role in the leadership process in educational organizations. Since the center of learning is the learner, successful faculty members understand this reality and direct their efforts towards harnessing the capabilities of learners. The success of students directly impacts the success of senior management, faculty members, colleges, universities, and society as a whole. Therefore, senior management in higher education institutions is a crucial factor in the successful implementation of Total Quality Management (TQM) requirements. Administrative leadership serves as the guide, teacher, and trainer, while TQM is a comprehensive approach that enhances the performance of all

stakeholders with full support from administrative leaders in university institutions. The more stable, interactive, and convinced the management is, and the more efficient its employees are, with positive relationships with students and faculty, and a high commitment to implementing quality standards, whether through maintaining university assets, providing services to students and faculty, or promoting a culture of quality and ensuring its proper implementation, the more management is committed to achieving quality for university institutions. From the foregoing, it can be said that administrative leadership of the university, with the implementation of TQM, must maintain continuous communication with its members, provide ongoing support for their aspirations, and utilize available resources efficiently and effectively to improve various activities needed by students, thereby increasing the university's capacity to preserve its current resources to meet the needs of future generations.

B. Spreading a culture of quality:

The collective participation of everyone, starting from senior management, in spreading and instilling a culture of quality in the minds of all employees is conducive to enhancing the university's orientation towards adopting Total Quality Management (TQM). This facilitates the proper and precise implementation of its requirements, and the support of senior management, supervision, and monitoring by them constitutes one of the fundamental pillars of spreading a culture of quality.In this context, "The authors in [6,7]".refer to Universities Total Quality Management as a new culture that universities must adopt to achieve the proper implementation of their requirements. Consequently, they can provide the best educational, research, and advisory services at the lowest possible cost and the highest targeted quality. Universities cannot achieve this implementation without spreading a culture of quality throughout the organization and among all its members, regardless of their positions or academic titles. This can be achieved through holding seminars, conferences, or discussion sessions on spreading a culture of quality and explaining the positive outcomes resulting from the implementation of Total Quality Management, whether for the members, stakeholders, or beneficiaries of all higher education outputs.

C. Collective Participation:

Engaging all employees in the educational institution, regardless of their administrative positions or academic titles, in the improvement process is a crucial step and a decisive factor for the successful implementation of the philosophy of Universities Total Quality Management (TQM). In this context, Al-Taweel and "The author in Reference [15]".emphasize that involving individuals in the decision-making process encourages them to work with an open and alert mind. Additionally, it promotes creativity, boosts morale, and fosters a greater sense of belonging and commitment to the organization. Furthermore, the participation of employees in continuous improvements is essential, enabling the university to use them to achieve the aspirations of its clients. They also highlight the requirements that contribute to the implementation of TQM in higher education, emphasizing the importance of considering the needs of employees and involving them in making decisions related to the quality of educational services. According to "The author in [17]".the success of an organization depends on continuous performance improvement and the motivation and skills of its workforce. Moreover, an employee's success increasingly relies on their access to new learning opportunities and the application of new skills.

Organizations need to invest in developing their workforce through education and training, providing opportunities for continuous growth and advancement. Lectures, on-the-job training, job rotation, and merit-based promotions can be relied upon as means to train and develop the workforce. The capabilities of faculty members, their academic and personal qualifications, and their earnest participation in developing their skills and abilities to effectively deliver academic material to students with dedication and sincerity, represent the core of the success of the educational process. Consequently, this contributes to achieving comprehensive quality for the entire educational institution. The appropriate number of faculty members and their assistants, along with the competence and experience they possess, and the continuous development of their self-capabilities, community service, and their scholarly output in terms of research and conferences, are the most accurate indicators for achieving University Total Quality Management (TQM).

From the above, it is evident that motivating university administrations to encourage employees to participate in decision-making and work earnestly contributes to improving the quality of educational, research, and consulting services. This includes identifying steps, determining obstacles and problems, finding appropriate solutions, and guiding them to make the right decisions.

D. Curriculum Development:

Systematic curriculum development is the cornerstone of the educational curriculum focus. An institution may start with advanced curricula, but the most important aspect of these curricula is their continuous alignment with the frontiers of science, consistently updated to provide students with the latest advancements in their field of specialization. Consequently, the methodology, approach, tools, and their relevance to real societal needs, as well as enriching and developing the learner's personality, enhancing their capabilities and skills, and keeping pace with their trends, represent significant aspects in achieving comprehensive quality for the university.

The success criterion for this approach is its alignment with the objectives of the student, the community, and the institution to achieve the highest quality and the most scientifically accurate curricula. The curricula should be suitable for the present and future of the student, addressing their educational objectives, solving their problems, and developing their behaviors as a tool to achieve university-wide Total Quality Management.

"The author in [5]". emphasizes curriculum development as a fundamental pillar for implementing Total Quality Management (TQM) in higher education institutions to comprehensively enhance the educational process through:

- Student quality
- Teaching methods quality
- Curriculum quality
- Educational program quality
- Course quality
- Faculty quality

According to "The authors in [8]".and Online "The authors in [18,29]".they emphasize the necessity of adopting foundations for curriculum development based on the essential pillars of university-wide Total Quality Management (TQM) through the following:

1. Adopting scientific principles in curriculum development.

2. Comprehensive scientific development of educational services.

3. Linking development to the reality of the educational system.

4. Considering educational development as a collaborative educational process.

5. Providing an appropriate database accompanying curriculum development.

6. Adopting experimentation and field application.

7. Continuous monitoring and evaluation.

8. Continuous senior management support for the philosophy of improvement and continuous curriculum development.

E. Responding to the Beneficiary:

The customer is one of the primary pillars upon which Total Quality Management (TQM) is based. They represent the central focus of activities and efforts, and therefore, they receive primary attention from the management. In the context of universities or colleges, the customer is directed towards the student on one hand and towards organizations and community events on the other. In both cases, the essence of the matter emphasizes the need to address their requirements. This may require significant modifications to some systems and regulations that should be designed and operated according to the philosophy of university management and the convictions of the staff. Systems should be established to ensure the best channels of communication with these customers (students and workers in community organizations) to meet these requirements without compromising the integrity of academic work in its core component, which is education. Therefore, focusing on the beneficiary means maintaining their satisfaction by fulfilling their needs, whether this beneficiary is internal or external "The authors in [13,24] “.

According to Barakat "The authors in [2,3]"., Total Quality Management, especially concerning the focus on the customer, involves identifying both internal and external customers, determining their needs and desires, monitoring and resolving their complaints, considering their opinions when developing new processes, maintaining current customers, and acquiring new ones. Therefore, it is essential to invite groups of current and prospective employees to gather their opinions about the institution's services and to understand their expectations and perceptions compared to competitors.

Based on the aforementioned, the researcher believes that gaining the loyalty of customers (students) by meeting

their needs and desires is one of the essential requirements for implementing Total Quality Management in colleges or universities. This will reflect on the university's achievement of its goals in terms of sustainability, continuity, and excellence over other universities.

F. Adopting an Appropriate Information System:

For the proper implementation of Total Quality Management in higher education institutions, ensuring the correct application of its requirements to achieve its strategies and future goals, and accurately responding to the needs and requests of the beneficiaries, it is essential to adopt a suitable and advanced information system. This system should serve all parts of the educational institution, its defined objectives, and its beneficiaries as a tool for making sound decisions that realize the university's goals and its current and future directions. This is achieved by providing the necessary information according to the specified characteristics for decision-makers, enabling them to consider multiple alternatives to choose the best and most aligned with the university's objectives and precisely drawn strategic plans "The author in [22]

G. Strategic Planning:

Strategic planning is the true starting point for the proper implementation of university-wide Total Quality Management requirements. It is the most capable requirement to establish the foundational pillars for the successful execution of other requirements, serving as the planner and guide for activities and tasks at all levels. Therefore, higher education institutions rely on phased strategic plans, some short-term and others long-term, which determine what needs to be done and the organization's current and future state. This is reflected through the university's vision, mission, and goals from a strategic perspective, defining the scientific principles that must be followed to achieve the set objectives. The accuracy of the achieved goals represents the most precise criterion for the success of the strategic planning adopted by higher education institutions. "The author in [7]

H. Education and Training:

According to Nothans (2000, p. 156), education and training are essential means to develop proper applications for Total Quality Management requirements. They are considered tools for renewing knowledge and enhancing capabilities towards improvement. Similarly, "The author in [17] emphasize that this requirement is crucial as it plays an active role in enhancing the recipient's abilities and capabilities to the best extent. Therefore, training is an educational activity that continuously reinforces education as a developmental tool that must be adopted for the successful implementation of university-wide Total Quality Management requirements to keep up with developments in the external environment and the educational sector in general.

The tasks of higher education institutions focus on providing suitable training, education, and qualification programs for all their members, including faculty members, their assistants, and staff, as a tool to deliver the best quality. This is achieved by providing the necessary tools and educational materials suitable for the type of teaching, as well as scientific research, in accordance with approved standards, whether globally or locally. Based on the above, the quality of higher education depends on the ability of this education to provide graduates with sound, skillful, intellectual, creative, and scientific education.

I. Continuous Motivation:

For the proper implementation of university-wide Total Quality Management requirements, it is essential to adopt a fair incentive system that enhances the employees' sense of justice towards the institution they serve. Consequently, they are motivated by satisfaction and conviction to offer more, as long as they expect their achievements to be evaluated based on the efforts they have exerted. It is worth noting the necessity of providing employees at all levels with what they deserve, whether in cash or in kind, as quickly as possible whenever feasible, and acknowledging every distinguished effort as a tool to encourage employees to perform the job correctly from the first time and every time. In this context, many studies have found a direct relationship between the performance of employees and their morale due to their motivation, recognition, whether materialistic or moral, and praising them for their outstanding achievements, regardless of their academic titles or job levels. "The author in [13]

3.Deming's Cycle for Continuous Improvement / Theoretical Framework

3.1. Introduction to Deming's Cycle for Continuous Improvement

Deming made numerous contributions to the field of quality and is recognized as one of the 50 most influential people of the 20th century, specifically in the development of the Japanese industry and redirecting it to the right path. He left a significant mark on the quality management movement by introducing his distinguished ideas and concepts to Japan and Britain. Moreover, many quality management scholars, such as Juran and Feigenbaum, based their ideas on Deming's theories, considering him the spiritual father of quality control in Japan or the guiding spirit of the third wave of the industrial revolution, emphasizing total quality. He introduced a novel philosophy in quality management known as the "Statistical Approach to Quality."

Deming's ideas gained prominence in the late 1950s and early 1960s, coinciding with the realization of Japanese industrial leaders that quality was the gateway to competing in global markets. After being invited by the academic professor at the University of Tokyo, Mariguti, Deming visited Japan to present his views and ideas on continuous quality improvement and proper performance. From the outset, he emphasized the principle that the workers are partners in the company and that any shortcomings are due to management if employees fail to meet their requirements. These ideas were well-received by the Japanese at a time when they did not gain acceptance in the United States. "The authors in [19,21]

Deming's contributions did not stop there. He was invited by several Japanese universities where he conducted seminars and discussion sessions that encouraged the Japanese to spread and continuously improve quality. Specifically, he influenced Japanese industrialists who were invited by the United States to transition from military and wartime industries to civilian industries. "The authors in [12,14]

Deming made numerous contributions in the field of quality management through his various theories and concepts. He introduced organizational approaches to address quality issues, drawing from the statistical ideas of Shewart in the PDCA (Plan-Do-Check-Act) cycle, the Fourteen Points, and the Seven Deadly Diseases.

The initial emergence of the concept of continuous improvement found its roots in Japan. Japan was the first cradle where the philosophy of continuous improvement grew and flourished. This was in response to the urgent need of Japanese companies to excel and distinguish themselves after the end of World War II. Toshiba was the first company to implement continuous improvement practices in 1946, followed by Toyota in 1950. Toyota was known for the term "Kaizen," which was described by Noori & Radford (1995, p.56) as a continuous and ongoing series of changes, no matter how small, aimed at continuous improvement without an end. This approach requires significant capital, continuous efforts, and the involvement of all parts of the organization with satisfaction and conviction to achieve the best. "The authors in [9,10]

According to The author in [17], the concept of continuous improvement was first introduced by Japanese scientists as a scientific method aimed at reducing waste in all its forms under the title "Kaizen." The origin of the term "Kaizen" comes from two words or terms: "Kai," meaning change, and "Zen," indicating for the better. Thus, Kaizen translates to "change for better" or "continuous improvement."

In the same vein, Marquardt (2002, p.14) emphasizes that continuous improvement does not simply mean making improvements continuously without facing challenges, obstacles, and threats. Based on the principle that improvements start with tasks and activities that do not conform to the task plan, meaning they are moving in the wrong direction entirely and do not achieve the desired performance level. Moreover, continuous improvement is a philosophy aimed at identifying errors and problems before or as they occur, preventing them, or addressing them immediately to prevent their escalation. Therefore, it is essential not to neglect continuous improvement efforts on activities and tasks that were performed correctly today to ensure they are executed better and more accurately tomorrow, continually enhancing, renewing, and improving the organization's performance.

"The author in [3] "The authors in [8]consider continuous improvement as a preventive philosophy that believes that activities and processes of an organization that do not add value represent a waste of the organization's efforts, time, and resources. This necessitates reducing anything and everything that does not add value or contribute to gaining a competitive advantage. Additionally, as expressed by "The authors in [22,3]continuous improvement is seen as a comprehensive process for all activities of the organization, consistently addressing both the input and transformational processes, the outputs, and the feedback that reaches the customer. The improvement process may result in a reduction in inputs, an increase in outputs, improved output quality, increased employee satisfaction, or customer satisfaction compared to the inputs.In the same context, "The author in [30] emphasize that continuous improvement aims to reduce costs since the production stages of product life cycles represent the elimination of waste in all its forms.We see that continuous improvement is the pursuit of excellence, the creation of distinction, and the achievement of sustainable competitive advantages through ongoing enhancements. This is achieved with the participation of all parties with satisfaction and conviction in generating added value and eliminating all forms of waste, be it in terms of time, effort, or costs. Consequently, this leads to cost reduction, overall improvement in quality, delivery speed, customer satisfaction, and fostering innovation in each of these priorities continuously. Here, it is evident that the attribute of continuity is derived from the constantly evolving changes in tools, demands, and requirements of customers, as well as the shortened product life cycle or the quality of the service provided. This necessitates that

contemporary organizations earnestly strive to engage with these changes and make every possible effort to anticipate customer expectations whenever feasible. With an emphasis on incorporating these objectives, the aim is to eliminate waste, subsequently reduce costs, and improve quality as factors to retain existing customers and attract new ones.

3.2. The Importance of Deming's Cycle for Continuous Improvement

"The author in [7] and "The author in [11] indicate that the importance of the philosophy of continuous improvement through the proper application of Deming's elements, according to scientific principles, revolves around the following:

1. Continuous improvement is considered a way of life and not just a tool or technique. It focuses on the customer rather than the market share, making it a fundamental cornerstone for the organization's success, sustainability, and superior performance.
2. Successful implementation of continuous improvement requires the support of all managerial levels within the organization. This is due to the changing demands and expectations of customers, necessitating ongoing communication with them while focusing on avoiding errors.
3. Continuous improvement is like a race, but it doesn't end with a specific finish line. It is an ongoing phase, and there is always room for improvement in all departments of the organization without exception.
4. Continuous improvement is based on the methodology of 'What' and 'How', rather than 'Who'. It relies on problem-solving approaches rather than a firefighting mentality, so to speak.
5. Continuous improvement processes adopt a philosophy based on the idea that prevention is better than cure, adhering to the principle of doing and implementing the right thing from the outset.
6. The philosophy of continuous improvement emphasizes both management and employees to adopt learning and make it the primary targeted objective. It is considered one of the supportive methods for organizations to strengthen their position and competitiveness in the global market with strength and power.

3.3. Requirements and Principles of Continuous Improvement

"The author in [12] and "The author in [4] indicate that continuous quality improvement has important requirements and principles that must be considered to achieve the philosophy of continuous improvement, as follows:

A. Requirements of Continuous Improvement:

1. Define improvement objectives.
2. Identify the material and human requirements for improvement according to a well-planned action plan.
3. Provide continuous and consistent support to senior management.
4. Form a high-level committee to precede the improvement processes.

5. Establish improvement teams and define their authorities and responsibilities.
6. Open channels of communication for everyone involved in the field of improvement.
7. Provide continuous and consistent motivation for all working individuals.

B. Principles of Continuous Improvement are as follows:

1. As long as improvement is continuous, it has no end; it is ongoing for the life of the organization.
2. The inclusiveness of the improvement process and not storing it.
3. The collaboration of all members of the organization for the success of improvement.
4. What is broken cannot be fixed but should be replaced with something new and advanced.
5. The absence of errors does not mean there is no need for improvement.
6. Collective work and participation.
7. Investing time to outpace competitors and giving priority, as improvement is everyone's responsibility.

3.4. Elements of Deming's Cycle for Continuous Improvement

American statistician Walter Shewhart was the first to establish steps or elements for continuous improvement in 1920. However, it did not receive the necessary attention. In 1950, Dr. Deming developed a model known as the Deming Cycle for Continuous Improvement, consisting of four elements later referred to as the PDCA cycle. These initials represent the following core elements: "The authors in [15,26, 18,20]

As the elements of Deming's Cycle for Continuous Improvement represent one of the self-management methods aimed at continuous improvement and better performance, applying them according to scientific principles is a fundamental approach for organizations to continuously strive for better performance. These elements serve as pivotal pillars for the success of organizations across various sectors and functions, especially with the increasing number of competitive organizations and the diverse needs and desires of customers. Additionally, the shortened product lifecycle, whether for goods or services, has compelled contemporary organizations striving for distinction and uniqueness to adopt and implement continuous improvement through the Deming Cycle elements. These elements consistently aim for excellence, making them the best tool to maintain the quality level of their outputs. It is essential for senior management to believe that this philosophy is an ongoing process that should not waver and can only conclude at the end of the organization's life cycle.

"The authors in [6,8]

This has motivated many organizations, including higher education institutions, to engage with continuous improvement to quickly respond to the demands and desires of customers, retain them, and attract more new customers. It is emphasized that this philosophy is based on the principles of inclusivity and collective participation, considering it a means and not an end. The pursuit of organizational distinction does not conclude upon achieving it; rather, continuous improvement is deemed the most essential and effective tool post-achievement. Maintaining distinction is more challenging than achieving it. The elements of this approach are as follows: "The authors in [21,18]

1. Plan:

This first step or element of the cycle involves planning what needs to be done. It includes identifying specific objectives, determining the specifications, characteristics, and standards targeted for the process, and the necessary operations. This is done after assessing the organization's internal capabilities, available skills, and opportunities in the external environment.

2. Do:

In this step, after a thorough review of the established plans and ensuring the availability of all necessary requirements to start the work process, this phase is executed with extreme precision to prevent any deviations or errors during the work performance, thereby ensuring the accurate implementation of the plans.

3. Check:

After translating the established plans into tasks, activities, and executed operations, this step or element requires those responsible for the implementation process to scrutinize, inspect, and review the tasks and activities that have been carried out. The aim is to assess how closely they align with the planned objectives, determining the extent to which the predetermined specifications and standards have been met.

4. Act (Implement Improvement):

This stage or element is considered one of the most important parts of the Deming Cycle. It involves implementing the required modifications and improvements on the stages, steps, or elements that preceded it. In this context, improvements at this stage are essential and obligatory, even in the absence of implementation errors. The elements of the cycle aim for continuous improvement, not just the identification and correction of errors or even preventing errors from occurring. Deming's philosophy is based on the continuity of making improvements, which distinguishes Japanese industry from other industries.

4.Field Aspect / Hypothetical Testing of the Study

4.1. Description of the Researched Field

The University of Zakho is one of the newly established universities in the Kurdistan Region, as per the administrative order issued by the Presidency of the Kurdistan Regional Government on 8/7/2010. The university started its academic year by opening two colleges: the College of Education and the College of Commerce. Currently, the University of Zakho comprises three colleges: the College of Engineering, which includes two departments (Petroleum Engineering and Mechanical Engineering), the College of Administration and Economics consisting of three departments (Financial and Banking Sciences, Economic Sciences, and Administrative Sciences), and the College of Education, which has two departments (Physical Education and Psychology). The university also includes the College of Humanities, which in turn consists of six departments (History, Kurdish Language, Arabic Language, English Language, Turkish Language, and Islamic Studies), and

the College of Science, which comprises six departments (Biology, Chemistry, Physics, Environment, Mathematics, and Computer Science).

4.2. Hypothetical Testing of the Study

1 - Testing the correlation relationships between the requirements of Universities Total Quality Management (TQM) and the elements of Deming's Cycle for Continuous Improvement at the overall level in the researched university.

Table 4: Correlation Relationships between the Requirements of Universities Total Quality Management (TQM) and Deming's Cycle Elements

Moral level	Spearman correlation coefficient	Hypotheses
0.000	0.631	There is a significant correlation between the requirements of total quality management combined and the elements of the Deming cycle combined
0.000	0.636	There is a significant correlation between top management support and the Deming cycle elements combined
0.028	0.310	There is a significant correlation between spreading a culture of quality and the elements of the Deming cycle combined
0.254	0.164^{ns}	There is a non-significant correlation between group participation and the Deming cycle elements combined
0.089	0.243^{ns}	There is a non-significant correlation between education and training and the elements of the Deming cycle combined
0.000	0.783	There is a significant correlation between the response to the beneficiary and the elements of the Deming cycle combined
0.176	0.195^{ns}	There is a non-significant correlation between a suitable information system and the Deming cycle elements combined
0.000	0.667	There is a significant correlation between strategic planning and the elements of the Deming cycle combined
0.000	0.614	There is a significant correlation between curriculum development and the elements of the Deming cycle combined
0.002	0.424	There is a significant correlation between continuous motivation and the Deming cycle elements combined

Significant	**at**	**level**	**(0.05)**
Significant	**at**	**level**	**(0.01)**
N=50	**Non-significant:**		**N.S**

Source: Compiled by the researchers based on the results from (SPSS)

The results of the correlation relationships between the requirements of Universities Total Quality Management (TQM) and Deming's Cycle elements indicate the following:

There is a significant correlation between the total requirements of university Total Quality Management and the total elements of Deming's Cycle, confirmed by a correlation coefficient value of (0.631). The calculated significance level of (0.000) is lower than the study's significance level of (0.05). This suggests that the more the university focuses on the requirements of Total Quality Management, the more it contributes to enhancing Deming's Cycle elements for continuous improvement. This result is consistent with the study by (Thomas & Lawrence, 2004), which emphasizes the interdependence and integration between the requirements of university Total Quality Management and continuous improvement in all aspects of the educational process. This is based on the idea that higher education relies on continuous improvement in all educational and administrative activities. Therefore, the data indicate the confirmation of the first main hypothesis, which suggests a significant correlation between the requirements of Total Quality Management and Deming's Cycle elements at the overall level in the researched university.

4.3. Partial Correlation Relationships Test

The results of the correlation relationships between each requirement of university Total Quality Management and DEMINQ Cycle elements are as follows:

A. There is a significant correlation between senior management support and Deming's Cycle elements, confirmed by a correlation coefficient value of (0.636). The calculated significance level of (0.000) is lower than the study's significance level of (0.05). This indicates that the more the senior management of Zakho University focuses on university Total Quality Management, the more it contributes to enhancing Deming's Cycle elements for continuous improvement in the university.

B. There is a significant correlation between promoting a culture of quality and Deming's Cycle elements, confirmed by a correlation coefficient value of (0.310). The calculated significance level of (0.028) is lower than the study's significance level of (0.05). This suggests that the more the university focuses on promoting a culture of quality, the more it contributes to enhancing Deming's Cycle elements in the researched university.

C. There is a non-significant correlation between individual participation and Deming's Cycle elements, confirmed by a correlation coefficient value of (0.164ns). The calculated significance level of (0.254) is greater than the study's significance level of (0.05). This indicates that Zakho University does not prioritize the requirement of collective participation in the university according to the opinions of the study sample. Therefore, the previous data suggest that there is no significant correlation between individual participation and Deming's Cycle elements.

D. There is a non-significant correlation between education and training individually and Deming's Cycle elements, confirmed by a correlation coefficient value of (0.243ns). The calculated significance level of (0.089) is greater than the study's significance level of (0.05). This indicates that the university does not prioritize the requirement of education and training as needed in Zakho University according to the opinions of the study sample. Therefore, the previous data suggest that there is no significant correlation between education and training individually and Deming's Cycle elements

E. There is a significant correlation between responsiveness to beneficiaries and Deming's Cycle elements, confirmed by a correlation coefficient value of (0.783). The calculated significance level of (0.000) is less than the study's significance level of (0.05). This indicates that the more Zakho University focuses on responding to beneficiaries, the more it will contribute to enhancing Deming's Cycle elements.

F. There is a non-significant correlation between the availability of an appropriate information system and Deming's Cycle elements, confirmed by a correlation coefficient value of (0.195ns). The calculated significance level of (0.176) is greater than the study's significance level of (0.05). This suggests that the university's management does not prioritize the provision of a suitable information system at Zakho University, according to the opinions of the study's sample. Therefore, the aforementioned data indicates no significant correlation between the availability of an appropriate information system alone and Deming's Cycle elements.

G. There is a significant correlation between strategic planning and Deming's Cycle elements, confirmed by a correlation coefficient value of (0.667). The calculated significance level of (0.000) is less than the study's significance level of (0.05). This suggests that the more Zakho University focuses on strategic planning, the more it will contribute to enhancing Deming's Cycle elements.

H. There is a significant correlation between curriculum development and Deming's Cycle elements, confirmed by a correlation coefficient value of (0.614). The calculated significance level of (0.000) is less than the study's significance level of (0.05). This suggests that the more Zakho University focuses on curriculum development, the more it will contribute to enhancing Deming's Cycle elements.

T. There is a significant correlation between continuous motivation and Deming's Cycle elements, confirmed by a correlation coefficient value of (0.424). The calculated significance level of (0.002) is less than the study's significance level of (0.05). This suggests that the more Zakho University focuses on continuous motivation, the more it will contribute to enhancing Deming's Cycle elements. Therefore, the data above indicates the verification of the second main hypothesis, except for the third sub-hypothesis (participation requirement), the fourth (education and training requirement), and the sixth (appropriate information system requirement).

4.5. Analysis of the correlation relationships between the requirements of comprehensive university quality management as a whole and individual elements of Deming's Cycle in the researched university

Table 5: Correlation relationships between the requirements of comprehensive university quality management as a whole and individual elements of Deming's Cycle

Moral level	Spearman correlation coefficient	Hypotheses
0.000	0.631	There is a significant correlation between the requirements of total quality management combined and the elements of the Deming cycle of continuous improvement combined
0.215	0.178 ns	There is a non-significant correlation between the total quality management requirements taken together and the planning element individually
0.000	0.689	There is a significant correlation between the total quality management requirements taken together and the continuous improvement work element individually
0.000	0.643	There is a significant correlation between the total quality management requirements taken together and the auditing and correction component individually
0.001	0.453	There is a significant correlation between the total quality management requirements taken together and the implementation element individually

Significant at the 0.05 level
Significant at the 0.01 level
N=50 Non-significant: N.S

Source: Prepared by the researchers based on the results from (SPSS).

The results from Table (5) indicate the following:

1- There is a significant correlation between the overall requirements of university total quality management and the elements of Deming's continuous improvement cycle. This is confirmed by a correlation coefficient of (0.631). The calculated significance level was (0.000), which is less than the study's significance level of (0.05). This suggests that the more the university focuses on the requirements of total quality management, the more it

will enhance the elements of Deming's continuous improvement cycle.

2- There is a non-significant correlation between the overall requirements of university total quality management and the planning element alone. This is confirmed by a correlation coefficient of (0.178 ns). The calculated significance level was (0.215), which is higher than the study's significance level of (0.05). This indicates that the administration of Zakho University does not prioritize the requirements of total quality management according to the study's sample opinions. Therefore, the data suggests that there is no significant correlation between the individual requirements of total quality management and the individual planning element.

3- There is a significant correlation between the overall requirements of university total quality management and the continuous improvement element alone. This is confirmed by a correlation coefficient of (0.689). The calculated significance level was (0.000), which is less than the study's significance level of (0.05). This suggests that the more the university focuses on the requirements of total quality management, the more it will enhance the continuous improvement element.

4- There is a significant correlation between the overall requirements of university total quality management and the auditing and correction element alone. This is confirmed by a correlation coefficient of (0.643). The calculated significance level was (0.000), which is less than the study's significance level of (0.05). This indicates that the more the university focuses on total quality management, the more it will enhance the auditing and correction element.

5- There is a significant correlation between the overall requirements of university total quality management and the implementation element alone. This is confirmed by a correlation coefficient of (0.453). The calculated significance level was (0.001), which is less than the study's significance level of (0.05). This suggests that the more the university focuses on the requirements of total quality management, the more it will enhance the implementation element. Therefore, the data indicates that all correlation hypotheses have been achieved except for the second sub-hypothesis related to the planning element.

4.6. Analysis of the Impact of University Total Quality Management Requirements on the Elements of Deming's Continuous Improvement Cycle

Table 6: Impact of University Total Quality Management Requirements on Deming's Continuous Improvement Cycle Elements

Elements of the Deming cycle				
Sig	**F**	**R2**	**B**	
0.000	31.725	0.398	0.631	**University total quality management requirements**

Significant at the 0.05 level Significant at the 0.01 level N=50 F (Table)=4.08 Source: Compiled by the researchers based on SPSS results.

The results of Table (6) indicate the following:

There is a significant positive impact of university Total Quality Management (TQM) requirements on the elements of Deming's Cycle for Continuous Improvement. This is evidenced by the Beta (B) value of 0.631. This means that a 1% increase in university TQM requirements will lead to a 63.1% increase in the elements of Deming's Cycle at its various levels. This is further supported by the calculated F value of 31.725, which is greater than the tabulated F value of 5.633. The calculated significance level (p-value) of 0.000 is less than the significance level of the study (0.05) within the degrees of freedom (1-50). The predictive power of the independent variable (university TQM requirements) on the dependent variable (Deming's Cycle elements) is represented by the determination coefficient R^2, which is 0.398. This means that 39.8% of the variance in Deming's Cycle elements is explained by the impact of university TQM requirements. Conversely, 60.2% of the variance is attributed to other variables outside the scope of this study. Based on the above, the third main hypothesis is accepted, indicating a significant impact of university Total Quality Management requirements on Deming's Cycle for Continuous Improvement at Zakho University.

5.Conclusions and Recommendations

Based on the theoretical overview, description, diagnosis, and analysis of relationships, correlations, and impacts presented in the study, several conclusions have been drawn. These conclusions have formed the basis for the following recommendations deemed necessary for the researched university and similar institutions:

5.1 Conclusions

Based on the presented results, the study has indicated the following theoretical and field conclusions:

1- Universities Total Quality Management (TQM) is a necessity, not an option, given the increasing developments in international universities. It is essential for our universities to keep pace with the latest advancements achieved by prestigious universities in various scientific fields.

2- The theoretical study highlighted the correlation and alignment between the success of different organizations and the adoption of Deming's continuous improvement cycle elements. It is not sufficient for organizations to perform their tasks with the same efficiency and effectiveness, especially in the field of higher education, which witnesses daily updates in sciences, curricula, and courses. Continuous improvement is imperative.

3- The study pointed out a decrease in the percentage of doctoral degree holders compared to an increase in the number of master's degree holders. This necessitates decisive action from the management of the researched university by encouraging faculty members to complete their studies to obtain a doctoral degree. This can be achieved by providing opportunities to pursue further studies in prestigious universities.

4- The above conclusion seems to have influenced the increase in the number of Assistant Professors and Lecturers at the researched university compared to the number of Professors and Associate Professors. This indicates that the academic departments are not giving the necessary attention to higher academic titles, despite their scientific significance.

5- The study highlighted the relative importance of the requirements of Total Quality Management in universities in terms of curriculum development and support from senior management. This suggests that the university's management is keenly interested in these essential requirements.

6- Conversely, the requirements of education and training, as well as continuous motivation, appeared to be of lesser relative importance. This necessitates a reconsideration of their implementation by examining the underlying reasons for this reduced interest.

7- Regarding the relative importance of continuous improvement elements, the implementation element came in first place. This indicates that the university's management consistently monitors its activities before their execution, considering it a fundamental pillar for achieving continuous improvement.

8- The study elucidated the correlation between the requirements of Total Quality Management in universities and the elements of Deming's cycle for continuous improvement. There was a significant correlation between them at both the overall and partial levels, highlighting the synergy and alignment between these essential variables for the success and prosperity of organizations.

9- The analysis reinforced the positive impact of the requirements of Universities Total Quality Management on the elements of continuous improvement, emphasizing the proper implementation of these improvement elements as adopted in the current study.

10- The description, diagnosis, and analysis of the relationships and impacts clarified the integrative relationship between the requirements of Universities Total Quality Management and Deming's cycle elements for continuous improvement in the researched university, thereby supporting the hypotheses of the study.

5.2 Recommendations

Based on the aforementioned conclusions, we believe it is essential for the researched university to give due attention to the recommendations derived from the above conclusions as a roadmap for future action to achieve optimal performance for its activities and tasks, **as indicated below:**

A- Due to the decline in the number of doctoral degree holders compared to master's degree holders,

incentivizing master's degree holders through establishing partnerships with international universities is a serious contribution to addressing the issue.

B- In line with the above, the shortage in advanced academic titles can be addressed by motivating staff towards conducting scientific research and completing doctoral studies as a solution to the shortage of assistant professor titles.

C- Emphasize continuous curriculum development alongside supporting the upper management's top ranks, considering that these two requirements are essential and reinforce other requirements towards proper application of all criteria.

D- Despite the importance of both education and continuous training and motivation, they received relatively lower importance. This necessitates addressing them by engaging exceptional individuals in external courses to achieve both requirements, along with adopting scientific principles for a fair incentive system that fosters a competitive academic environment among all staff, especially faculty members.

E- Despite the importance of accurately implementing plans as a component of continuous improvement and their role in achieving excellence, they did not receive the expected relative importance. Therefore, this element needs more attention by engaging those responsible for implementing plans and challenging tasks in developmental courses to enhance their performance.

F- Emphasize the establishment of partnerships with universities that are similar to the specializations of the colleges of Zakho University and entering into scientific and cultural agreements, as well as joint supervision, as a tool for performance development and exchange of scientific experiences.

G- The necessity to organize international scientific conferences and invite holders of academic titles as effective means to merge experiences, opinions, and generate innovative ideas to enhance the performance of higher education institutions.

H- Holding seminars and dialogues with the graduates of the researched university who are working in both public and private sectors, in addition to inviting the management of these sectors to address the real needs of these sectors from the university's specializations to improve the performance of its colleges according to the real needs of the labor market.

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