TOTAL QUALITY MANAGEMENT IN HIGHER EDUCATION: A SOFT FACTOR

APPROACH BASED ON FACULTY SATISFACTION

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ABSTRACT

The literature review showed very few organization-wide Total Quality Management (TQM) implementations and mixed opinions regarding its compatibility in Higher Education Institutions (HEIs). Considering the human-centric nature of HEIs this study investigated the interrelationship between the Soft TQM Factors, Faculty Satisfaction, and Student Success. A survey was designed to assess respondents' perceptions regarding the implementation of Soft TQM Factors and satisfaction among faculty. Analysis of the responses revealed a clear positive relationship between Soft TQM Factors and Faculty Satisfaction. Moreover, Faculty Satisfaction was found to be associated with one of the measures of Student Success, the Graduation Rate. Thus, this study validates the significance of a Soft Factor approach of TQM implementation that concentrates on human-centric factors to enhance Faculty Satisfaction, which may, in turn, foster greater Student Success. The study also yielded a valid survey tool for assessing the implementation of Soft TQM Factors and Faculty Satisfaction in HEIs.

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LIST OF ABBREVIATIONS

TQM ....Total Quality Management

HEIs…………………………………….. Higher Education Institutions

COE…………………………………….... College of Engineering

CHAPTER 1. INTRODUCTION

State funding in higher education started to decline after the great recession of 2008. Despite a slight recovery in state funding in higher education in recent years, after considering the inflation of public colleges and universities expenses, the relative funding remains well below the pre-recession levels in most of the states in the United States of America (USA) (Jackson & Saenz, 2021; Mitchell, Leachman, & Masterson, 2017). With the adverse economic effects of the corona virus pandemic, 50% of the states have further cut funding for higher education, resulting in additional financial and programmatic uncertainties for the higher education institutions in those states (Jackson & Saenz, 2021). With reduced state funding, and to compensate for the revenue loss, tuitions have been raised very sharply ranging from 35 % to over 50 % in some states (Jackson & Saenz, 2021). In turn, not only have higher tuition rates have made higher education less affordable to students and thereby has reduced graduation rates but also has led to a reduction in student services offered as well as jobs available in the academic sector (Mitchell et al., 2017). Thus, with long-term state and national economic outcomes at stake effective management of Higher Educational Institutions (HEIs) has become a prime concern.

With exponential growth in the educational sector, HEIs have now become a substantial part of the service industry. Universities of developed countries with renowned education structures attract applications from students across the globe by emphasizing the quality of education provided in their institutions. Given the globalization of the education sector and increasing competition in the market, the need for HEIs to develop effective quality improvement initiatives is higher than ever (Latif et al., 2017).

Total Quality Management (TQM) is a management philosophy drawn from the ideas of "quality gurus" such as Juran, Feigenbaum, Deming, and Crosby. Though it has been defined in

various ways in different scenarios, TQM basically encompasses organization-wide commitment towards improving the performance of goods, services, and employees to enhance customer satisfaction (Bayraktar et al., 2008). In fact, TQM covers every aspect of day-to-day activities and operations in an organization. TQM came into existence in the manufacturing sector but was later adopted in the service sector following its success in manufacturing.

Total Quality Management approaches have evolved, and new procedures have been added to contribute to the improvement of quality control. The development in TQM was primarily based on experience rather than theory-driven. As a result, various components of TQM do not band together as a cohesive whole depending on where it is implemented (Ackoff, 1999; Houston, 2007). TQM is a blend of "hard factors" that includes tools and approaches, and "soft factors" which comprises people, culture, and management (Vincent; 2020). TQM elements may have varying degrees of relevance in different sectors and their impact might vary vastly from one sector to another (Asif et al., 2013). Depending on the sectors of the economy in which TQM is applied, some elements that are more relevant in one context could be least relevant in another. This goes along with the contingency theory which states that there is no one best way of doing anything which could be applied in all cases. Implementation of TQM in an educational setting requires understanding TQM principles and adopting them in specific ways that suit educational institution scenarios (Asif et al., 2013). Thus, for the proper implementation of TQM in the higher education systems more empirical testing is required to develop a TQM approach that best suits the HEI contexts.

Problem Statement

For TQM to be recognized as a feasible quality management approach in higher education, its implementations must be holistic focusing on the overall goals of an institution rather than a

piecemeal approach. A review of the literature showed very few organization-wide TQM implementations along with mixed opinions regarding the compatibility of TQM in the higher education sector were found. This suggests the necessity to explore and experiment in designing TQM to better suit HEIs so that it can be applied organization-wide not just in bits and pieces. Moreover, it is imperative to carry out empirical studies that will examine various models of TQM to be implemented in the HEI environment.

Further, soft TQM elements play crucial roles in HEI as it is highly human-centric in nature compared to other industries. Many studies in various industries have shown that TQM implementation has a positive impact on satisfaction as well as efficiency among staff (Chang, Chiu, & Chen, 2010; Jun, Cai, & Shin, 2006). Similarly, in the case of HEIs, job satisfaction among faculty and staff has been found to translate into enhanced service quality and student satisfaction (Trivellas & Santouridis, 2016). Yet, there is little to no research that has objectively measured the effectiveness of soft components of TQM in terms of "Faculty satisfaction" and its consequence on the performance of students. Additionally, viable instruments are needed to measure the efficacy of different components of TQM and its possible relationship with faculty satisfaction and students' success.

Significance of the Study

The exploration of various approaches of TQM suitable for HEIs would support the implementation of proper TQM strategies, which could highly benefit these institutions through improved performance and the establishment of a better campus climate, and a greater number of successful students. With no tangible product in higher education, TQM needs alteration to regard the exclusive features of education (Singal et al., 2016). Considering the human-centric nature of HEI and the central role of faculty in the overall success of an educational institution, this thesis

presents a TQM approach in which soft aspects are emphasized to improve Faulty satisfaction which in turn could enhance the output of the institution measured as student success. It also provides a survey instrument that can be used to assess the extent of soft TQM implementation and faculty satisfaction.

Research Hypothesis

There are positive efficacy relationships among the soft components of TQM, Faculty satisfaction, and student success (i.e., a higher score of soft TQM correlates with a higher level of faculty satisfaction and student success.).

Operational Definitions

Soft TQM elements represent human-centric aspects of TQM. In this study, soft TQM elements include leadership, vision, employee involvement, recognition and rewards, education and training, student focus, and other stakeholder' focus.

Faculty Satisfaction is measured using questionnaire items based on factors developed from the literature and expert opinions. Those factors include Flexibility, Pay & Benefits, Satisfaction with Autonomy, Departmental Climate, Opportunity for development, and Management System.

Student success is measured through graduation rate, and job placement rate.

CHAPTER 2. LITERATURE REVIEW

This chapter reviews relevant literature that covers a discussion on defining quality in HEIs and introduces TQM, including a brief history of TQM implementation in HEIs compared to other industries. The first sections of this chapter encompass critiques regarding the applicability of TQM in HEIs as well as explore TQM elements that will lead to the success of TQM in HEI. Furthermore, this literature review differentiates between soft and hard TQM factors and shows that soft and hard TQM factors are interdependent. The last sections of this chapter review the interrelationship between employee satisfaction and customer satisfaction and how TQM implementation has positively impacted employee satisfaction.

Quality in Higher Education Institutions

A global competition exists among universities to attract students to become part of their campuses. Central to that competition is improving the quality of education provided to the student "customers" while also considering the expectation of other stakeholders which include parents, employers, and society (Sagnak et al., 2017). Socio-economic demands and cultural transformation have pressured the educational system to become more responsible and accountable for producing quality graduates. In the same manner, increasing expectations from stakeholders have forced higher education to shift from a focus on quantitative expansion to prioritizing the quality of its services.

Accreditation bodies in HEIs such as ABET evaluate colleges and universities on their academic quality. They examine colleges, universities, and programs for quality assurance and quality improvement. The accreditation process consists of professionalizing quality assurance, teaching-learning, quality research and innovation, reallocation of resources, development of several policy guidelines and their deployment, etc. (Singal et al., 2016). The accredited status of

an institution is an indication that the institution meets the set standards based on curriculum, faculty, facilities, student success on the state licensing examination and job placement rate, etc. (Eaton, 2015).

In today's business environment which entails the risk of turbulent change and uncertainty, responsiveness and adaptability have become the key to success for many institutions. Likewise, innovation is the highlight of gaining a long-term competitive advantage (Liao et al., 2010). As a further note, these authors argue that because of the increasing popularity of the idea of lifetime learning HEI has now been replaced with CEI (continuing education institute). The challenges faced by the academic sectors include instability in academic policies, the decline in student population, and limited government financial support which make universities act like business firms where profitability is the prime goal (Liao, Chang, & Wu, 2010).

I. S. Chen, Chen, & Padró (2017) assert that there is a "triangle of coordination" in higher education that involves the state, the market, and the academic oligarchy. The state's interest is focused on the regulation of academic standards while the market's interest revolves around having a knowledge economy as well as capitalizing on knowledge resources for value creation. Similarly, academicians' interest is directed towards meeting the needs of students, society, and the well-being of the institution itself. This can be achieved by adopting and enhancing practices based on traditional academic domains, controlling cost, and continuous quality improvement initiatives (I. S. Chen et al., 2017).

Currently, schools, particularly HEIs have immersed themselves in a market-oriented environment whereby "delighting customers' becomes the focus of their efforts as it is the main objective of Total Quality Management. Customers, as understood in this sense, covers both internal and external stakeholders (Sahney et al., 2004). In order to enhance the quality of service,

an educational institution needs to know what constitutes quality. The proper understanding of such necessities would allow the HEIs to formulate strategies to tackle the prevalent issues through the application of TQM practices. However, people foresee quality variably, Owlia and Aspinwall (1997) specify that it is vital to find out the characteristics of quality to understand and correspondingly improve the quality. Thus, it is crucial to determine the characteristics of quality for the measurement of the education process (Garcia, 2015).

According to Sallis (1993), when seen through the lens of TQM, in the field of education, learners are the output or products. Products must be scrutinized under the quality assurance process to facilitate the most appropriate supply and its source. Moreover, to produce quality products, there must be a standardized process that ensures that high-quality methods are being utilized to educate students in order to produce students who are well-educated and well versed in their subject. The quality assurance chain of a product begins with, the supply of raw materials. Applying this step in the quality process of HEIs implies that universities must conduct the initial selection of students. HEIs must set up mechanisms to filter students who are eligible for higher education through conducting examinations, interviews, etc.

The next step in the quality chain is that universities must come up with a set of criteria and standards in hiring educators as well as ensure that those responsible for educating the students are adept in their professional fields. Proper training and professional development programs must be formulated for educators to ensure they are well-qualified to impart knowledge to the students because merely being educated does not guarantee good teaching. HEIs must focus on instilling teaching qualities in the new educators they recruit (Sallis, 1993). Finally, a competitive set of curriculums, teaching materials, facilities, and student services are considered as the necessary raw materials of HEI. Overall, TQM proponents assert that TQM must be implemented by HEIs to

ensure that resources are used creatively and efficiently. It involves managing all factors of an organization namely: practice, process, methodologies, systems, and human assets (Todorut, 2013). This wholistic "total" quality management is considered necessary, as each factor has an equivalent cost to the organization and may lead to low organizational performance if not functioning properly.

Total Quality Management: Its Importance, Key Elements, and Understanding

Total quality management (TQM) is a management philosophy and a set of guiding principles that seeks to integrate all organizational functions (marketing, finance, design, engineering, production, customer service, etc.) to focus on meeting customer needs and organizational objectives (Flores-molina, 2011). 'Total' in this context means the involvement of everyone and everything in the organization in a continuous improvement effort (Flores-molina, 2011). Only after 1970, TQM start receiving acceptance as a general management philosophy rather than being considered a narrow discipline related to engineering and quality control.

Over the years, TQM has been operationalized in various ways, but fundamentally it encompasses the organizational processes, culture, and climate as well as the attitudes of the employee. TQM philosophy revolves around the idea that all activities and improvement initiatives must be directed towards customer (both internal and external) satisfaction (Gloria & Talavera, 2004).

According to the American Society for Quality (ASQ) "Total quality management can be summarized as a management system for a customer-focused organization that involves all employees in continual improvement". Eight principles of TQM as defined by ASQ are customer focus, total employee involvement, process-centered, integrated system, strategic and systematic approach, continual improvement, fact-based decision making, and communication.

To best understand TQM, it is of utmost importance to understand its elements i.e., soft factors and hard factors. The soft factors involve human-centric management concepts and principles such as leadership, employee empowerment, and culture, while factors relating to quality improvement tools and techniques are referred to as "hard" factors (Fotopoulos & Psomas, 2009). Rahman and Bullock (2005) suggested that having appropriate soft TQM elements in place creates the necessary condition for effective implementation of hard TQM factors in an organization. Further, their study also suggests that in addition to the direct effect of soft TQM on organizational performance, soft TQM also indirectly affects the performance via influence on hard factors (Rahman & Bullock, 2005).

The primary impetus behind the wide implementation of TQM practices over the last few decades has been that it is a highly customer-centric approach and in the modern business environment, customer satisfaction is of utmost importance and especially in the service industry. It is reasonable to expect that HEIs can widely benefit from TQM simply because organizations would be able to provide more value to their customers i.e., Students and other stakeholders, which would ensure that both parties are able to generate value from the transaction. Studies have reflected that the organizational culture has an impact on TQM implementation as institutions with a more adaptive and innovative culture tend to benefit more from TQM practices (Valmohammadi & Roshanzamir, 2015). However, it is also possible to utilize TQM strategies to make positive changes to organizational culture. In terms of performance, scholars have suggested through research that TQM positively impacts a company's performance through improvement in customer satisfaction, better innovation, quality enhancement, improved operational efficiency, and ultimately better financial results (Valmohammadi & Roshanzamir, 2015).

In the modern business environment, TQM is being considered as an important catalyst in organizational performance enhancement primarily because its principles are based on continuous improvement of all aspects related to the organization. The focus of TQM practices is to make necessary modifications in all weak areas of the entity and ensure there are minimal weaknesses in the business organization. Basically, TQM aims to achieve an organization's optimum performance through the process of analyzing and implementing changes according to the evaluation of the organization's characteristics. TQM was already expanding to most industries globally by the end of the '90s and was projected to continue to emerge as an important aspect of the success of a modern organization (Ghobadian & Gallear, 1996). Higher Education Institutions can surely benefit from the proper implementation of TQM but there are several complexities in its implementation. TQM requires the integration of all organizational activities and often requires major structural changes in the organization which need to be implemented by the top management and leadership. TQM has become a widely researched topic primarily due to the success that various industries have received post its implementation. However, as organizations operate under complex systems that are dependent on a number of factors it becomes difficult to implement TQM on a large scale. Despite challenges, systematic implementation of TQM has been shown to benefit businesses through improved performance as it is directly proportional to improving employee and customer satisfaction (Chang et al., 2010).

History of Total Quality Management in Higher Education Institutions

After being applied in the industrial sector for several decades TQM finally made its way to HEIs, most especially in developed countries. The earliest reported implementation of TQM was in 1980 at Fox Valley Technical College in the US (Sibel Ahi, 2015). The influences of integration of TQM in the HEI scenario are a product of benchmarking derived from various

manufacturing companies such as Texas Instrument, Xerox, IBM, and Motorola that were able to reap the benefits of TQM to overcome the global competition and ever-changing business environments. The initiative to consider TQM in HEIs was also influenced by the ongoing crisis in the education sector during the 1980s as observed from the decline of quality in baccalaureate resulting in public concern for accountability and responsibility of HEIs. In the 90s many HEIs in the USA began implementing TQM and approximately 50% of universities established an organizational structure for quality (Kanji & Tambi, 1999). In the case of developing countries, there is a lack of proper knowledge of TQM due to the inadequacy of transferring research findings across countries, resulting in TQM implementation starting more recently and remaining least studied in those countries. Additionally, since TQM is dependent on contextual factors, the research finding regarding TQM in developed countries cannot be applied directly to the less developed countries and requires focusing on their distinct requirements (Asif et al., 2013). Overall, organization-wide implementation of TQM practices focusing on critical processes in HEIs is still very limited as most research has been done in developed countries with a limited small-scale approach which is dedicated mostly to non-academic, administrative processes (Bilen, 2010). An extensive literature review carried out by Nasim et al. (2020) suggested that though research has made substantial progress in TQM in Higher Education, the biggest setback lies in the lack of a holistic approach in TQM implementation. Existing studies inclined towards focusing on individual parts of Higher Education institution such as students, library, teaching & learning, industry engagement and research while neglected the main idea of TQM which emphasizes on totality of quality management.

Total Quality Management in Higher Education Institutions Compared to Other

Industries

Despite the aforementioned research documenting limited successes, studies also support the assertion that the application of TQM in education may be a sound initiative. Each industry operates based on its environment; the TQM practices suitable for one industry might not be suitable for another. This only suggests that evaluation and success indicators of TQM are not universal and vary sector by sector. A review of studies in different countries resulted in a claim that there is an analogy between higher education and other industries regarding operational activities (Kanji & Tambi, 1999). Additionally, several TQM models designed for the academic environment are found to be coherent with those used commonly in other business types such as manufacturing and service industries (Demirbag et al., 2006). It may be that the conflict on the application of TQM in schools arises from the nature of the operation and objectives of HEIs. Schooling is considered to fall in the category of professional service, yet it is different because it involves a sense of nobility through rendering pure service which requires a high degree of interpersonal relationship, customization, complexity, and divergence (Srikatanyoo & Gnoth, 2005).

Critiques on Implementation of Total Quality Management in Higher Education

Institutions

Since the implementation of TQM in higher education, limitations on its transferability have been observed and advocacy on its implementation remains under debate (Houston, 2007). Sirvanci (2004) agreed that TQM has been proven to be successful in other industrial settings but is presented with more challenges and obstacles when adopted in the academic climate. Houston referred to the earlier works of Flood and Jackson to interpret the issue of quality in HEIs as a

"mess of interacting issues" (2007, p.4). He critically examined the applicability of TQM in the higher education system and suggested that either TQM needs to be modified completely into a different methodology which will then not remain the conventional TQM practice, or the higher education system needs to build a different organizational image that will fit the conventional TQM methodologies (Houston, 2007).

A major reason discussed by Houston (2007) behind the argument that TQM is not a proper fit for HEIs is that it is highly different in its nature from other organizations where TQM has already been widely applied. The organizational structure and culture in HEIs do not have the same objectives because the primary motive of industrial organizations is to make financial profits but HEIs first motive is to ensure delivery of services to its customers i.e., the students. The concept of regarding students as customers has often been highly criticized as well. The proper examination of the tools of TQM reflects that while it looks attractive it might not apply to the HEI context. Houston (2007) questions the compatibility of TQM in the HEIs noting that the concepts of TQM do not match that of education. According to Houston, the application of TQM practices in educational institutions at a large scale might prove to be far from fruitful. He proposes that this fundamental drawback in TQM application in HEIs might not have been noticed over the years because there have been very few large-scale applications of TQM practices across educational institutions. In order to evaluate and understand the actual impact of implementing such practices in HEI organizations under practical circumstances, there needs to be a number of large-scale implementations over a considerable period of time (Houston, 2007).

The implementation of TQM in the academic field has been met with various additional criticisms. One criticism was presented by Militaru, Ungureanu, & (Crețu), (2013) in the statement that the theory of TQM as proposed and elaborated by Edward Deming may be applied to the

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educational process but only in precise alignment with the purpose of education. TQM was originally developed based on the many processes of the manufacturing industry, but Deming developed a TQM model based on the "humanist philosophy". The point being, that the students should not be compared with and considered as products of the manufacturing process (Kanji & Tambi, 1999). Implementing TQM in HEI isn't easy especially because of the strong academic culture and its resistance to the terminologies used to explain TQM such as product and customer which do not easily resonate with HEIs (Zabadi, 2013). Massy (2003) explained, "The greatest resistance to quality process improvement comes from professors who think it's just another business-oriented fad. The language of some TQM advocates contributes to this view, customer, scientific method and removal of all forms of waste is sure to raise the hackles of academies." (p. 165). TQM practices as they were first developed for manufacturing and other industrial sectors certainly have a positive impact on organizational performance if properly implemented. However, its applicability in the service sector and especially in HEIs is yet to be tested at a large scale. This is a noteworthy consideration as universities patterned their TQM implementations in the same manner the manufacturing industry has applied it. Moreover, the government's intervention in the adoption of this process for HEIs, as well as other industries, is believed to be tainted by the imposition of bureaucratic agenda (Kanji, Abdul Malek, & Tambi, 1999, referring to the words of Tannock).

Critiques by Koch and Fisher (1998), however, focused on the process of TQM as adopted by not only schools but the industry in general. In their statement, the promise brought by this theory puts higher education at a place where it seeks outcomes akin to TQM. Two major factors were identified by the authors to have been left out by the HEIs in the integration of TQM theory with their operation. First, the TQM for the academic setting had insufficient empirical evidence

making its promises merely anecdotal and sparse. The survey conducted by Owlia and Aspinwall (1996) also showed that sufficient empirical evidence was found to be lacking. To conclude, the goal of TQM in HEIs is clear and it is likely that it might have a positive impact on HEIs performance if required modifications are made. However, major concerns regarding the implementation of TQM practices in educational institutions remain. The lack of experience in terms of implemented TQM practices in HEIs and other service sectors poses a severe challenge in the successful implementation of TQM activities in the educational institution context. As discussed above, several critiques on the implementation of TQM in HEIs suggest that TQM might not be suitable for such organizations and its large-scale implementation might not prove to be beneficial at all. Thus, any university and school president intending to implement TQM processes must be cautious especially if such a university or leader is gravely concerned with the costs. The number of universities that successfully implemented TQM in a meaningful manner is quite low, and the time and effort exerted are higher than its gains in most cases. The cost-benefit analyses of the theory are in fact lacking (Koch & Fisher, 1998).

Sallis (1993) implied that, in general, everyone is aware when quality is experienced. Aside from quality being the definition of excellence, it is the division that separates success and failure. TQM philosophy would be a great tool for universities to deal with change and set objectives and agendas. On the other hand, universities implementing this process should not immediately expect rewards as TQM will never bring any result overnight nor can it operate as a solution to every issue that besets the academic industry (Sallis, 1993). Supporting that statement Hrnčiar & Madzík (2017) noted that "quality initiatives have produced significant improvements in producing quality students based on employer's requirements, but the fact remains that the process cannot be realized over a night". They studied the implementation of quality management systems (QMS) on higher

education institutions, specifically, the effect of maturity of the quality management system of higher education institutions on the quality of graduates and employers was tested. They carried out an empirical study based on the data obtained from three interested parties of higher education institutions: Teachers, Graduates, and Employers. These three interested parties were interviewed to determine the maturity level of the management system (Interested party "teacher"), the quality of graduates (Interested party "Graduates"), and satisfaction level of employers with the quality of graduates (Interested party "Employers"). It was found that higher education institutions that have a mature QMS, on average, achieve better results than institutions that do not have a fully matured system. The results advocate the fact that to reap complete benefits of any quality initiatives time plays a major role and maturity is necessary to gain improvements.

Importance of Total Quality Management in Higher Education Institutions

The need to improve the quality of HEIs has been of prime importance to increase the number of graduates as the graduation rate is considered to be a measure of the success of students (Sibel Ahi, 2015). Moreover, new challenges surrounding higher education prompted institutions to seek benefits from the application of Total Quality Management. These challenges affect students, teachers, and the whole academic industry. As an example, the job market is more competitive than ever since companies have a higher pool of applicants to select from. The present status of the job market makes students and their parents more selective in deciding which university to join for higher education and a primary criterion is the ability of a university to produce graduates better prepared than the graduates produced by other universities. Consequently, for universities to assess their service quality has become a continuous process as emphasized by Nikel & Lowe (2010). Sibel Ahi (2015) also referred to Kuiper's work in 2005 as the former reiterated the two cultures existing in the HEI environment that must be touched by

TQM, and these are "management culture" and "academic culture". The management culture gives attention to the finances of the institution while the other is focused on teaching and learning as well as research and scholarship (Sibel Ahi, 2015). The presentation of the human-centric aspects of academic cultures of HEI perhaps resulted in the conflict with the term "management" in TQM. However, Manatos, Sarrico, and Rosa (2017) tried to fill in a gap on this issue by highlighting the value of integration. As these authors pointed out, the process of integration over time allows for the development of quality management strategies covering the different processes of an institution, its organizational levels, and all principles encompassed in quality management (Manatos et al., 2017). This holistic consideration proposed by Manatos, Sarrico, and Rosa (2017) should provide a more considered and comprehensive understanding of the relationship and dependency between the two cultures of the HEIs.

The academic culture as touched by TQM greatly affects the teachers and the learners. Dahil and Karabulut (2013) acknowledged that difficulty in finding qualified personnel has been a challenge for many HEIs. Most industries have utilized effective training and development programs to prepare their employees to carry out activities according to the principles of TQM. On the other hand, HEIs must also focus on the fact that employee satisfaction is an integral part of TQM practices hence, such institutions must focus on the internal aspects first before expecting positive results such as higher levels of customer satisfaction. The same goes for other industries as they hunt for employees that would meet the set standards of their organizations. Additionally, the authors Dahil & Karabulut (2013) suggested that HEIs should offer educational standards that match the requirement of the students and society. This suggests that the preparation of an environment that helps improve the quality of the graduates and the training of people who facilitate quality learning should be the utmost focus of universities in improving the quality of

their services. Hence, this calls for balancing the demands of school administrators and faculty members, and also calls for school requirements that accord with the needs of students, societies, and economies. Importantly, to achieve quality services, the management of HEIs must first address the skill development of their teachers and ensure that their processes are in alignment with the new methods and new technology for teaching. In a sense, this requirement of quality management offers an opportunity for professional growth and skill advancement to educators. A focus on providing for the ongoing professional development of educators can be expected to improve the quality of teaching staff, and that is likely to eventually be reflected in students' success in their academic performance and in the development of competencies that employers seek. Looking at the scenarios encompassing TQM in higher education, benefits are born out of the interconnection of changes and hurdles of HEIs as they strive to improve the quality of their services and be globally competitive (Dahil & Karabulut, 2013).

Al-Bashir (2016) commented on various factors, the learning environment as well as the quality of services offered by HEIs. TQM, if applied, in the academic setting would provide an institution a competitive position in the higher education market. This is possible because the TQM tools provide bases on determining whether a school follows the required conditions for learning and teaching. Interestingly, TQM uses both quantitative and qualitative tools to help HEIs identify their organization's weaknesses and improve those through their identified strengths (Al-Bashir, 2016). TQM for higher education emphasizes Customer Focus and orientation, teamwork, leadership, pross-oriented approach, process design, and the overall environment. HEIs' recognition of the role of TQM in improving their process and providing the right learning environment have helped identify significant factors to practice a culture of quality. The quality of faculty, technological structure, syllabus, certification organization, research environment,

administrative policies, and procedures greatly impact the quality of education. This was realized when the Pakistan Commission on Higher Education required all private and public HEIs to implement and practice TQM norms to the objectives of making Pakistan universities centers for development, education, and research (Baig et al., 2015).

Implementation of Total Quality Management in Higher Education Institutions

After an exhaustive review of literature for conceptualizing the various constructs of TQM and developing a comprehensive model, Sakthivel & Raju (2006) developed the 'TQM 9-C EDEX Model' that considers nine quality factors for HE in the case of Engineering education in India. The model has four process elements; first is "Impetus" which contains the Quality factor 'commitment of top management and leadership', the second element "Implementation System" comprises 'customer focus', 'course delivery', 'communication review', 'campus facilities', 'continuous assessment and improvement', and 'congenial learning environment'. While the third and fourth process elements "Measure of progress and "Results" consisted of the quality factors 'customer value' and 'customer satisfaction', respectively. The model considers the student as the primary customer who is the direct recipient of education (subject matter and knowledge), which is the product, an intangible return for the tuition fees paid to the institution by the student. Besides, the author also concluded that the Quality Teaching-learning process can ensure customer (student) satisfaction by producing a value-added product (Sakthivel & Raju, 2006). However, there have been several criticisms over the fact students are nowadays considered as a customer in educational institutions as it is stated that it may deviate the management of HEIs from the ultimate objective of establishing such organizations i.e., to impart education. The concept of considering students as customers is highly controversial and one of the main reasons because of which several

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researchers have stated that TQM practices are not tailor-made for HEIs because the approach of TQM is highly customer-centric.

Higher education institutions' aim to further enhance the quality of their operation and services led to the application of various TQM approaches and models. Some examples include the TQM application by an HEI in Abu Dhabi has been presented where, the tool Quality Function Deployment (QFD) has been used considering Student and the employment Market as the customer (Al-Bashir, 2016). Additionally, tools such as Affinity diagrams, Tree Diagrams, Pareto Charts, and fishbone diagrams have also been used to boil down the customer requirements, technical requirements, quantification of the relative importance of customer requirements, etc. Finally, the Quality Function Deployment matrix thus constructed was then also used to benchmark the universities under consideration. The author concluded that TQM has a remarkable application in HEIs, and it can help to improve their competitive position, satisfy all stakeholders, focus on the market needs, and achieve higher performance (Al-Bashir, 2016).

Qureshi et al. (2014) proposed the use of the DMAIC model for Pakistani HEIs to join the international competition. Since the international battleground is no longer just about the mobility of students, the curriculum, facilities, and research, and other endeavors related to academia must be customized based on an internationally inclined standard. This initiative to implement the DMAIC model in Pakistan HEIs was given focus because of the recognition that education is required everywhere, and that improved education has been among the top agendas of politics all over the world. Studies conducted in educational institutions in Pakistan reveal that the challenges related to the effective implementation of TQM practices are more widespread in a developing country like Pakistan in comparison to the USA or the UK.

The main challenge of proper implementation of TQM in developing countries is a lack of experience in the field of TQM implementation in HEIs in developing countries because of the research gap, and also because of the lack of large-scale implementation. It is only recently that developing countries such as Pakistan, Nepal, and India have started thinking of improving their education systems through the implementation of HEIs. Infrastructural challenges also pose a significant threat to the growth of TQM implementation in developing countries primarily because a large number of educational institutions do not have up to the market infrastructural facilities. To successfully implement TQM practices on a large scale to ensure that the education system in the country benefits from it, is highly important to make necessary structural changes at the governmental level. The establishment of training and development programs and focusing on soft TQM aspects would be vital. Sufficient funding and structural changes for the implementation of the practices would also be required to ensure the HEIs can reap the benefits of Total Quality Management (Suleman & Gul, 2015).

DMAIC involves the steps: Defined, Measure, Analyze, Improve, and Control, the combination of which is a continuous quality improvement effort cycle. In all the 5 phases of DMAIC, quality progress is the ultimate advocacy of the model (Qureshi, Janjua, Zaman, Lodhi, & Tariq, 2014). Larina discussed the relevance of the "Plan-Do-Check-Act" or PDCA model in the improvement and internalization of HEIs. The author's justification for this model stated that PDCA considers the existing policy of the higher education institution for innovation and development. The study was conducted on the premise that development in higher education management should be based on modern solutions and should be process-based. For this, Larina reiterated that the quality education process is determined through quality management in organization and planning of the curriculum, quality of teaching, quality of facilities, and quality

of resource support, and quality of methods and human resources (Larina, 2015). Surprisingly, all these items are nearly the same factors mentioned by Baig et al. (2015), Bayraktar et al. (2008), Sakthivel and Raju (2006), and Qureshi et al. (2014). Moreover, the case study conducted by Dowlatshahi (1996) on the application of TQM in higher education concluded that curriculum must be revised, extensive assistance must be given to students, teaching and instruction policy must be modified based on the ability of students to acquire learning on a day-to-day basis, and apply selective filtering of students (Dowlatshahi, 1996). Considering the similarities in the result of studies and investigations conducted by different people, it is safe to say that the total higher education system must be reviewed and improved to achieve the organizational objectives of the HEIs. Houston has already mentioned that only "systems thinking" will shift the focus of quality control considering the much wider purpose of higher education in achieving the desired outcome, as cited by (Asif, Awan, Khan, & Ahmad, 2013). The concept of 'System thinking', strongly advocated by Houston, is an impoverished understanding of systems and organizations seen as systems. The system thinking approach is more applicable to HEIs primarily since the structure of educational institutions is widely different from that of conventional organizations. To benefit from TQM implementation, HEIs need to make necessary adjustments in TQM principles because the methods utilized in the industrial sector cannot be replicated. The system thinking approach will ensure a logical and systematic approach to the implementation of such measures according to the requirements of HEIs. It is not logical to directly apply TQM strategies in an HEI organization without making necessary modifications to the TQM strategies or to the company structure itself (Houston, 2007).

The HEIs adoption of Total Quality Management has presented various possibilities and criticisms. Many authors believe that this process does not fit the structure of academia. On the

other hand, many authors believe that TQM can be designed to fit the requirements of HEIs. The topic of how TQM would benefit HEIs touches various factors and cultures affecting the services of academic institutions. However, in various literature, authors have put forward strong points that have supported the implementation of TQM practices in HEIs as it has significant benefits to key stakeholders and the institution implementing it.

Critical Success Factor (CSF) of Total Quality Management in Higher Education Institutions

To meet the objectives aimed at the implementation of TQM, universities must consider factors that are critical to their success. In 1984, Boynton and Zmud defined critical success factors (CSFs) to be "things that go well to ensure the success of a manager or/and organizations". They include areas that ensure higher performance some of these as pointed out by Holloway during the 90s are top management commitment, training, and good information. With a survey of several companies, it was discovered that each industry utilizes a universal set of critical success factors. This discovery was used to determine the CSF of HEIs as they integrate quality management and endeavor business excellence. In supplementary to the CSF, an evaluation of the HEIs processes must be conducted to draw a point comparison between the actual process, process definition, process design, and process improvement. And once this has been done innovative academic processes may be then applied. This would also help determine whether the much talked about ISO 9000 is suitable for school climate and issues surrounding its adaptation for academic settings may be overturned and considered as rooms for opportunity rather than crucial criticism. This is very significant as many believe that TQM is absolutely a tool that would help HEIs obtain continuous development and progress regardless of the institution's outstanding problems or issues.

Bayraktar et al. (2008) did an intensive literature review on quality management literature and identified 11 Critical areas of TQM in an HEI. Their TQM dimensions comprised of leadership, vision, measurement and evaluation, process control and improvement, program design, quality system improvement, Employee involvement, Recognition and reward, Education and training, student focus, other stakeholders' focus. They further developed a TQM implementation instrument using a survey in Istanbul-based Higher education institutions, which can be used for profiling the extent of TQM implementation in any HEI (Bayraktar et al., 2008). Similarly, Asif et al. (2013) worked on the identification of critical success factors of TQM in the higher education institution of Pakistan. Eleven constructs of TQM application in Higher education were chosen from the literature and included in the empirical study, out of which 6 elements were found to be Critical Success Factors of TQM in Pakistani universities. Leadership, vision, measurement and evaluation, process control and evaluation, program design and resource, other stakeholders were found to be the Critical Success Factors of TQM, of which leadership was found to be the most significant success factor followed by others, respectively. The author also included the statement that results were particularly based on the perception of TQM in Pakistani universities which were influenced by the economic and social conditioning of the HEIs in Pakistan (Asif et al., 2013).

Multiple factors that could influence the perception of TQM and TQM implementation in HEI were the basis of Suwandej's study, in which factors affecting student learning experiences were assessed. The result of which concluded that leaders, in this case, HEI administrators and presidents must be consistent with their purpose of improving the quality of products (students) and services (Education). Training must be given to the Employees (staff and faculty) to shape and re-shape behaviors towards the learning of the students, and emotional engagement & participation

are necessary for achieving organizational success which could only be achieved through teamwork (Suwandej, 2015).

Soft and Hard Aspects of Total Quality Management

TQM elements for HEI have varying degrees of advantage when applied by a specific institution or learning environment (Bayraktar et al., 2008). Hence, we can't deny the possibility that every TQM implementation in HEIs might require specific molding of the set of TQM elements based on the merits of that institution.

Management and people aspects such as leadership, people management, customer and supplier relationships are components of soft aspects of Quality Management, while tools and systems necessary for the implementation of Quality Management principles, such as quality tools and techniques, process management, measurement, and product/service design are related to the hard aspects of Quality Management (Abdullah & Tarí, 2017). Table 1 shows some of the examples of Soft and Hard TQM factors widely used in the literature.

Table 1: Hard and Soft TQM Factors

Hard Factors	Soft Factors
Statistical Process Control	Employee Involvement
Quality Function Deployment	Teamwork
Histogram & process Chart	Empowerment
Tree Decision Diagram	Top management Commitment
Critical Path Analysis	Continuous Improvement
Fishbone or Ishikawa Diagram	Customer Satisfaction
Quality Data Reports	Reward and Recognition
Product/ Service Design	Training and Education
Process Management	Supplier Relationship

Ratny, Arshad, & Gaoliang (2018) looked upon the relationship between Hard (system-oriented) and Soft (Behavioral) components of quality management and their impact on service quality. Service quality (SQ) was considered using five measures: Tangibility, Reliability,

Responsiveness, Assurance, and Empathy. The results of the Hierarchical regression analysis showed that the Hard TQM elements: Continuous improvement, ICT usage, and information systems have a direct influence on Service quality, of which Continuous improvement practice was found to have the most significant correlation with service quality, followed by ICT usage. Soft elements: top management support, customer service, service culture, and knowledge sharing were also positively correlated with the SQ, of which top Management Support highly affects the quality of service followed by service culture. Further analysis showed that all soft-hard elements of TQM were positively correlated with each other as well, which implies that the soft factors assist in the enhancement of hard factors. Thus, researchers have concluded and recommended that the organization should concentrate upon the mix of hard and soft TQM elements to attain an enhancement in service quality as well as to sustain customer satisfaction and loyalty. Also, Abdullah & Tarí (2017) did an empirical study in Malaysian E & E firms which found out that hard QM aspects as confirmed by many other researchers (Ahire & Dreyfus 2000; Eng & Yusof, 2003; Kaynak, 2003; Rahman and Bullock 2005) positively affects the performance. But most importantly, the empirical evidence showed that implementation of support from soft QM practices such as management commitment, Customer Focus, employee involvement, training and education, reward and recognition, and supplier relationship enhances the effectiveness of hard QM implementation. A combination of well-strategized soft TQM and hard TQM practices is ideal for the success of organizations. However, it is also evident that it is not possible to implement hard TQM aspects without the implementation of soft TQM.

A highly motivated faculty member is more likely to utilize the latest technology effectively in educating the students in comparison to a faculty member who is not committed to the organization or not satisfied with the job. Thus, educational institutions must also focus on

formulating a blend of soft and hard elements of TQM so that the soft elements can enhance the advantages of hard TQM. Since HEIs are highly human-centric, a lot of focus needs to be put on soft aspects of TQM followed by hard aspects.

Impact of Total Quality Management on Employee Satisfaction

The report to honorable Donald Ritter identified in their review of American companies who adopted TQM techniques that better employee relations were realized after TQM implementation and the measures included improved attendance and employee turnover (Boulder, Kissoon-charles, Based, & Toya, 2015). Further, an empirical study carried out at a car manufacturing company to analyze the relationship between TQM practices, process innovation, and employee performance examines the effect of TQM implementation on employee satisfaction which gives us a different perspective on how employee satisfaction and TQM are interrelated. The study considered Job satisfaction and workplace environment as the performance measures for employee performances. Of which employee satisfaction was identified as the critical success factor for employee performance. Six critical factors of TQM were considered in the study namely, Customer Focus, leadership, training, teamwork, communication, and top management. From the linear regression analysis of the empirical data strong correlation was found between TQM practices and employee performance. This implies TQM practices impact employees' work-related attitudes, such as job involvement, job satisfaction, career satisfaction, and organizational commitment as well as encourages employees' participation, promote empowerment, and recognize that employees play an important role in achieving the organization's goals, its objectives and treat employees as a primary resource (Dedy et al., 2016).

Additionally, an analytical study was carried out within a major Malaysian outsourced semiconductor assembly and test organization (OSAT), in which the link between soft elements

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of TQM and the employees' job satisfaction was examined. Five core elements of soft TQM elements were chosen: customer focus, teamwork, organizational culture, reward and recognition, and organizational trust. The result of the study showed that teamwork was perceived as one of the most strongly associated TQM practices with job satisfaction. Which supported the views of Osland (1997) & Anschuz (1995), that working in a team leads to better employee attitudes and is a prerequisite for a successful organization to achieve the partnership between workers and managers. Further, customer focus and organizational culture were found to have a significant positive relationship with the employee's job satisfaction (Boon Ooi et al., 2007). Likewise, Chang et al., (2010) conducted a study with Chinese government employees studying the relationship of soft TQM factor with employee satisfaction. The study concluded that employee empowerment, employee compensation, teamwork, and management leadership were positively linked with employee satisfaction. Further, Jun, Cai, & Shin (2006) surveyed manufacturing firms in Mexico to understand the impact of HR-focused TQM factors on employee satisfaction and loyalty. The statistical results indicated that empowerment, teamwork, and employee compensation among all HR-focused TQM factors had a positive influence on employees' work satisfaction out of which employee empowerment was the strongest influencer. Moreover, similar research conducted in small and medium organizations in Iran also established that of all the human-centric TQM practices employee empowerment, training and development, appraisal system and employee compensation were the significant positive predictors of employee's job satisfaction. However, employee compensation among all the factors was found to be the most crucial factor for employee satisfaction (Chaichi & Chaichi, 2015). In a nutshell, numerous parallel studies demonstrate the strong influence of human resource-related TQM factors on employee's job satisfaction (Arsić, Nikolić, Živković, & Urošević, 2012; Jain, 2010; Prajogo, Cooper, Prajogo, & Cooper, 2010).

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Therefore, the implementation of soft TQM factors is very crucial to make sure that employees are satisfied with their job.

The Interrelationship between Employee Satisfaction & Customer Satisfaction

The human resource inclusion principle of TQM propagated by Crosby is an approach where worker input is valued and encouraged as a central to the quality improvement program. Empowering the employees makes them more responsible for their actions and develops a sense of ownership towards the organization. Employee empowerment has a strong relationship with job satisfaction which in turn is strongly related to customer satisfaction (Ugboro & Obeng, 2000). Ukil (2016) did a study engrossed in employee perception of employee empowerment. The empirical study investigated the influence of employee empowerment on employee satisfaction and service quality along with the impact of employee satisfaction on service quality. The results showed that employees' perception of empowerment was high, which indicated that empowerment has been given higher importance by the employees. Further, the results of statistical analysis came out to support all the three-hypothesis considered in the research showing a positive and significant interrelationship between employee empowerment, employee satisfaction, and service quality. The study concluded that empowered employees are highly satisfied and offer better services. While it is clear that employee empowerment in HEIs is likely to have a positive impact on employee satisfaction and ultimately performance, it is necessary to understand that the implication of TQM in educational institutions is widely different from conventional industries. The reason behind that is the difference in organizational objectives. Conventional industries primarily aim to make financial profits. However, educational institutions need to focus more on imparting proper education rather than on financial profits. Hence, it is important to empower employees and encourage them according to organizational objectives custom to HEIs. TQM practices focus on

achieving higher levels of employee engagement by empowering them and providing a suitable working environment that enhances the performance of the employees. When the employee performance gets improved, it will directly have a positive impact on the customer satisfaction levels because the organization would be able to offer better quality products/services to its customers because of the dedication of the employees towards the company (Ugboro & Obeng, 2000). This corresponds to the Service-profit chain framework that has been widely used in the literature which suggests that if employees are content with their company, they will likely deliver better service to meet customer's expectations, which in turn will result in financial profitability (Heskett et al., 2008).

There is substantial research establishing the positive relationship between employee satisfaction and customer satisfaction (Brown & Lam, 2008; Gouws, Habtezion, Vermaak, & Wolmarans, 2006; Kurdi, Alshurideh, & Alnaser, 2020). Employees' experience at their workplace dictates their satisfaction level and only satisfied employees can have a customer-centric attitude in their work and work-related interactions which could positively impact the satisfaction of customers (Bulgarella, 2005). Chi & Gursoy (2009) investigated the relationship between employee satisfaction and customer satisfaction and their effect on a hospitality company's financial performance. The outcome of the study suggested a direct linkage of customer satisfaction with financial performance and employee satisfaction with customer satisfaction. Similarly, Wangenheim, Evanschitzky, & Wunderlich (2007) conducted a study in 99 outlets of a large German Do-It-Yourself (DIY) retailer investigating the relationship between employee satisfaction and customer satisfaction. The results indicated that even the satisfaction of employees who are not usually in direct contact with the customers affects customer satisfaction while the effect was found to be greater for employees who directly interact with customers. Likewise, a

recent study by Son, Kim, & Kim (2021) in the coffee shop industry concluded that service climate affects employees' job satisfaction which later improves customer satisfaction. Thus, TQM implementation should concentrate on the soft TQM aspect to assure employee satisfaction, which would further translate into customer satisfaction (Ooi et al., 2011).

Looking at the unique characteristics of the HEIs, we can say it is different from other organizations as there are important human aspects associated with every process of HEIs. If the faculty is satisfied with the job and well-engaged, they can provide an enriching learning experience to the students and would encourage the students to perform well in terms of academics. A study done by Torregosa, Ynalvez, & Morin (2016) examined if students' perception of faculty caring has any effect on their academic performance. The survey established that faculty caring especially faculty's optimistic attitude and empathy towards students augments the academic performance of students. Also, a study conducted in Armenian higher education institutions found a significant relationship between student satisfaction and academic performance (Martirosyan & Saxon, 2014). So, it is fair to say, faculty satisfaction can promote student satisfaction which can further result in better academic performance.

Widespread implementation of soft TQM aspects within HEIs promotes an environment that is focused on the achievement of organization objectives which in the case of educational institutions is to impart proper education. So, faculty being the direct influencer of the quality of the graduating students should be focused primarily while implementing TQM. Financial profits in HEIs are only a secondary objective which is almost automatically achieved when the management focuses on the proper implementation of practices to achieve the first objective. The above-discussed circumstances reflect that it is important to implement soft TQM practices in HEIs to improve the human aspects such as employee motivation, engagement, and commitment, and

the chances of it improving customer satisfaction are highly likely (Umbach & Matthew R. Wawrzynski, 2015). Following, in the search for a suitable TQM approach, it is highly probable that a soft factors-based TQM approach can be a better fit for HEIs. Hence, to investigate this quest, after a thorough study of TQM application in HEIs, this thesis brings forward a soft factor TQM model based on faculty satisfaction which focuses on the people aspect (soft aspects) of TQM.

Comparative Table of Soft Total Quality Management Elements

Table 2 shows the group of factors used in the literature for explaining soft aspects of TQM in different sectors. According to the area of work different terminologies were used, however, leadership, vision, reward and recognition, employee involvement, training and education, and customer focus were found to be the repetitive theme of soft TQM in most of the studies.

Table 2: Soft Total Quality Management Elements Explored in the Literature

Terminology Used	Elements	Reference
TQM soft element	• Organizational Trust • Customer Focus • Reward and Recognition • Teamwork • Organizational Culture	(Boon Ooi et al. 2007)
Soft TQM dimensions	• Workforce Commitment • Shared Vision • Customer Focus • Use of Teams • Cooperative Supplier Relations	(Rahman & Bullock 2005)
Soft TQM elements	• Total Employee Involvement • Continuous Improvement • Strategic Quality Planning • Continuous Training • Teamwork • Empowerment • Customer Satisfaction • Information and Analysis • Supplier Management • Top Management Commitment and Support • Democratic Management Style • Culture Change	(Imeri et al. 2014)
HR-related CSFs	• Visionary Leadership • Customer Focus Orientation • Effective Communication • Congruent Objectives • Staff Selection and Deployment • Competent Staff • Teamwork Spirit • Recognition and Motivation • Training and Education • Innovation and Creativity	(Ali et al. 2010)
Soft TQM Elements	• Top Management Support • Customer Service • Service Culture • Knowledge Sharing	(Ratny et al. 2018)
Soft Factors	• Quality Improvement • Organizational Performance • Management Commitment • Customer Focus • Employee Involvement • Training and Education • Reward and Recognition	(Abdullah et al. 2010)
Soft TQM Elements	• Top Management Commitment • Continuous Improvement • Training and Education • Customer Focus • Process Management • Workforce Management • Supplier Relationship	(Sutrisno 2019)
QMS Soft Elements	• Management Commitment • Customer Focus • Employee Involvement • Training and Education • Reward and Recognition • Supplier Relationship	(Abdullah & Tarí 2017)

CHAPTER 3. CONCEPTUAL FRAMEWORK

The strong connection between soft TQM factors and employee satisfaction has been well established in the general TQM literature as discussed in Chapter 2. This indicates that adopting soft TQM factors can be very effective in assuring employee satisfaction. Further, the positive association between employee satisfaction and customer satisfaction as found in the literature implies that only satisfied employees can have a customer-centric attitude in their work and work-related interactions which could positively impact the satisfaction of customers. Numerous earlier studies have depicted the necessity to focus on employee satisfaction to improve service quality, organizational performance, and productivity (Ariani, 2015). Further in the case of HEIs, as shown by a study of Torregosa, Ynalvez, & Morin (2016) faculty caring especially faculty's optimistic attitude and empathy towards students augment the academic performance of students. Also, it is generally more likely that a satisfied faculty would have these attributes than an unsatisfied faculty. So, this study is centered on the concept that soft TQM would enhance faculty satisfaction and faculty satisfaction in turn will improve student success. Soft TQM factors leadership, vision, employee involvement, recognition and rewards, education and training, student focus, and stakeholder's focus are the basis for good management of any organization including educational institutions. The conceptual framework shows the relationship of the Soft TQM factors with faculty satisfaction that eventually influences the success rate of the students.
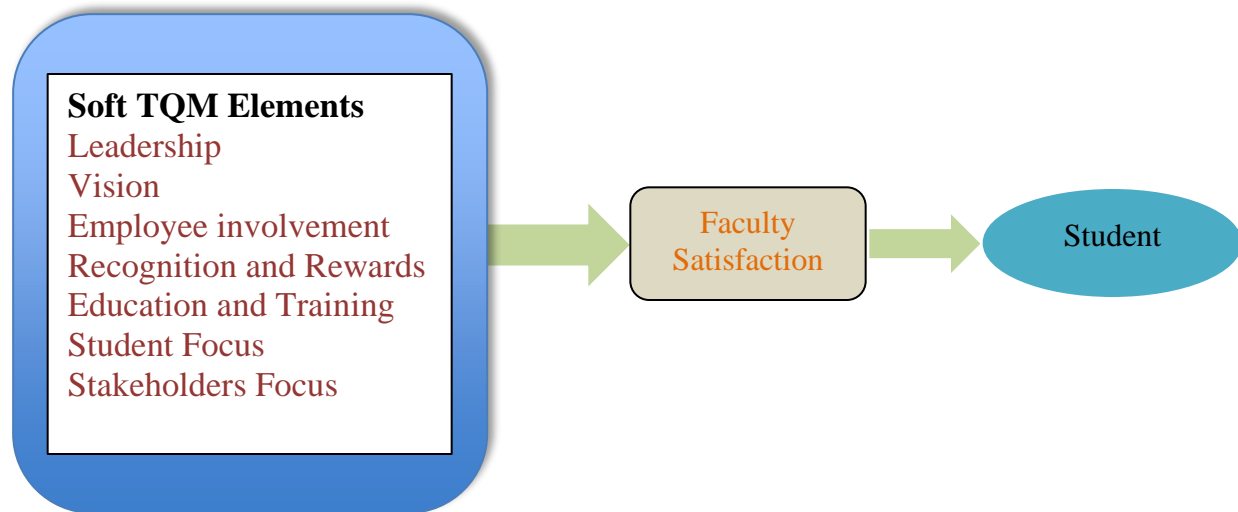
Figure 1: A Soft TQM-based Approach to Access Faculty Satisfaction and Its Relationship with Student Success.

Leadership

Top managers, leaders of any organization are responsible for accounting for quality and supporting the quality-related initiatives to achieve the organizational goals. They are the architects of change initiatives who need to direct the workers and the organization itself, for successfully implementing TQM in any kind of organization. Visionary leadership has been suggested to be a critical requirement for any HEIs quality initiatives, as personal leadership and participation of top executives creates a sustainable customer-focused work orientation and provide clear and visible quality values (Ali et al., 2010). Most importantly, for the proper initiation and operation of TQM, the higher management needs to be dedicated to the continuous improvement of quality, not just one-step improvement to an acceptable level (Boulder et al., 2015).

Kuiper (2005) suggested that there are two cultures within HEI management culture and academic culture. These cultures are often the competing factors among the HEIs. The management culture focuses on financial profitability while the academic culture is all about teaching, learning, and Scholarship. These two facets of culture within HEI are reflective of the foundation that two opposing paradigms - leadership and management – exists. Where

management is perceived as intrusive, restrictive, and grounded in unnecessary administrative tasks that are concerned with functional effectiveness and efficiency. While Leadership is seen to be collaborative, focused on setting, and motivating others in new directions, and aligned to achieving established and shared goals that promote high-quality teaching and learning (Ramsden 1998). Thus, effective leadership and best practices in HEI are complex and require an all-around approach that includes different behavior and practices (Parrish, 2011).

Furthermore, the attitude and beliefs of the leaders, their knowledge of TQM, and their participation levels are the key factors that need to be looked upon for the establishment and preservation of TQM in HEI (Galen, 2003).

Vision

Every organization needs a vision framework that incorporates its guiding philosophy, core values and beliefs, and purpose. The guiding philosophy is sculpted by the leaders through their thoughts and action nevertheless the vision should represent the whole organization rather than just a single leader and should also evolve with time. The core values and beliefs exemplify the organization's fundamental principles about what they consider important in business, its conduct, its social responsibility, and its response to change in the environment. They function as a guiding force that considers all the concerned stakeholders. The purpose of the organization should be a development from the guiding philosophy, core values, and beliefs and should swiftly convey how the organization is to fulfill its role.

Vision is the outline that determines the future state of an organization (S.-H. Chen, 2012). It is a public declaration of what type of organization to be in the future. Organizational values, beliefs, and business practices characterize the vision of an organization (Bayraktar et al. 2008). Though in many previous studies 'Vision' has been considered as a subset of "leadership". In the

case of HEI "vision" should be considered as a distinct category, which is supported by respondents to an HEI-based survey who perceived 'Vision' as an important element of TQM. Further, given the knowledge-intensive and dynamic environment of HEIs, an inability to formulate a clear vision may lead to failure. In an HEI, collectively articulating vision through input from faculty is more desirable than imposing a vision by the top management. This also endorses the contention that 'vision' should be considered as a distinct category from 'leadership' in the case of HEI (Asif et al., 2013). Moreover, while implementing TQM, it is imperative to communicate the company vision throughout the organization subsequently stimulating organization-wide dedication in the people to achieve the specified targets (Ali, Mahat, and Zairi, 2010).

Employee Involvement

Incorporating employee involvement in the culture of an organization inspires everyone in the organization to be directly or indirectly involved in quality improvement processes, decision-making processes, and problem-solving which in turn is instrumental for the financial success of the organization (Yusuf et al., 2007). The quality culture can only be created and sustained by giving high priority to involving employees at all stages regarding their workplaces, environment, process, products, and management practice (Nadim & Al-Hinai, 2016). Employees' involvement in various activities gives them a chance to improve their abilities and to increase their knowledge base, making them confident to express their creativity and problem-solving skills. While on the other side, the coaching process that is focused on broadening employees' knowledge base and skill-sets play an important role in fast-tracking employee involvement in an organization (Stanojeska et al., 2020). Overall, Increasing understanding and commitment from employees and

securing an enhanced contribution to the organization is the management agenda behind the philosophy of Employee involvement (Kok et al., 2014).

TQM stresses self-control, self-sufficiency, and creativity among employees. It is about striving for greater active cooperation rather than just compliance. TQM practices provide opportunities for Social interaction and reinforcement by focusing on teamwork and cross-functional relationships (Nadim & Al-Hinai, 2016). Employee involvement tools such as job rotation, suggestion system, quality of work-life, quality circles, self-managed work teams, job redesign, joint labor-management committees, and employee representation on the board of directors are also widely used in companies (W. Chi et al., 2011).

Given that the HEIs are also facing the forces of globalization like the corporate organizations, they are not capitalizing on the potential of their biggest assets – the faculty and management employees. That is one of the main reasons why universities are among the least engaged workplace in the world. It is known that leadership behavior has a huge impact on the engagement of employees in an organization. Moreover, it was found in a study that Ethical leadership in an HEI influences employee behavior and mindset thus contributing to motivation, drive, commitment, and feeling valued, which in turn positively impacts the Employee involvement culture (Bhana & Suknunan, 2019).

Rewards and Recognition

Rewards and recognition are the highly influencing factor for the employee's performance. Eventually, it is the money or acknowledgment that matters the most to workers. Ensuring that the employees feel their work is significant and they have been praised fairly, is a way to satisfy the employee and stimulate their commitment towards the company (Gul et al., 2012). Rewarding the employees for their quality improvement efforts further motivates them to contribute to various

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quality initiatives such as feedback to improve products and processes and participation in process design. An employee's compensation can be financial and non-financial rewards for the team or individual who contributed to TQM efforts (Chang et al., 2010). Reward practices such as profit sharing, gainsharing, employment security, and pay-for-performance enhance the correspondence between quality management practices and employee performance (Abdullah & Tarí, 2017).

Employees aspire to be recognized and credited for their efforts. Higher-level staffs play a vital role in initiating and establishing reliable reward systems that acknowledge employees' contributions to total quality objectives (Chang et al., 2010). A standard and clear procedure to evaluate the performance level of employees and selection criteria for reward is needed. In HEIs, to enhance the staff's level of organizational commitment, the recognition and reward system should evaluate based on the staff's involvement (Nadim & Al-Hinai, 2016).

Reward systems in HEIs are outlined in terms of achievement in research and achievement in teaching. While several robust measures such as research assessment, publications, grant income, etc. are already in place for research achievement, equivalent measures for achievement in teaching are challenging to define, because the general perception is the reputation in research determines the income from teaching. Thus, regarding rewarding the achievement we all are on the same page, but the bottom line is to measure it (Gunn and Fisk, 2014).

Training and Education

Not just retaining productive people but a continually improving workforce is needed for effectively implementing TQM in any organization (Walton, 1991). Training the employees not only helps them to attain individual progress by broadening their knowledge but also equips them with skills to engage in more efficient teamwork. Several studies have suggested that employees who receive training report higher levels of job satisfaction than those who do not. Essentially,

employee training enhances an employee's ability to perform tasks by facilitating the updating of skills. Additionally, the employees' professionalism and commitment to the organization are also found to be positively impacted by employee training (Chang et al., 2010).

The benefits of training and education can only be harnessed when the real needs are identified, and the level of potential benefits are clear. Employees themselves also play an active part in identifying their training needs (Ghobadian & Gallear, 1996). Employees need to be educated and trained in areas such as team building, empowerment, problem-solving, and utilization of statistical and quantitative techniques in planning designing, and monitoring quality (Gloria and Talavera, 2004). Training and education generate an increased awareness of quality-related issues playing a critical role in the implementation of quality management practices. When employees have higher levels of training and collaboration, it becomes much easier to implement hard quality management practices (Abdullah and Tarí, 2017).

Similar to other organizations HEIs also need to have the necessary plan in place concerning the training and education of their staff for implementing a quality-related program. Mainly, the accessibility of financial arrangements required for training and education of employees is compulsory to gain awareness in all the regarding fields and succeed in TQM implementation (Nadim & Al-Hinai, 2016). While applying TQM in an HEI, it's preliminary to train senior management followed by the academic staff. TQM requires the total cooperation of all members of an organization and constant training to encourage quality products (Aljuhani, 2019).

Student Focus

Just the same as satisfied customers are the key part of any other successful business, satisfied students are crucial to the success of any institution of higher learning. The matter of

ensuring the satisfaction of students should be the center of every education policy. With rising tuition fees of HEIs, not many students will be satisfied with a degree that is not valued in the labor market. Also, in a time of unprecedented global competition, to remain competitive in the long run HEIs need to make sure that they are conscious of the need to provide students with quality education and a learning process that nurtures success (Mark, 2013).

In an HEI, instructors are expected to set standards and guide the students in the learning process. But students as customers also conjointly produce their education according to their specifications and desired outcomes. The role of an academic has now changed from being the one who has all the answers to being a facilitator who manages the context, provides resources, and presents queries to invigorate students to think up their own answers. It should be noted that students are now more conferred to set specifications concerning learning standards and their own desired outcomes. Which further requires the HEI to prioritize student focus (Mark, 2013).

Furthermore, universities should implement effective customer relationship management policies to achieve student satisfaction. They should aim to exceed students' expectations through effective student lifecycle management by ensuring quality admission procedures followed by regular interactivity with students regarding their activities in the university (Ogunnaike et al., 2014). Conforming to the principles of focus on the customer, examining students' quality perceptions, expectations, and satisfaction are very necessary to improve the quality of higher education (Karahan & Mete, 2014). Staying within academic ethics, a close connection with students is critical for recognizing their actual needs. For a successful TQM program in an HEI 'student focus can be employed via activities such as collection and evaluation of student complaints, course evaluation, student club activities, and follow-ups of the alumni (Ogunnaike et

al., 2014). Similarly, (Nadim & Al-Hinai, 2016) also recommended HEIs to have a feedback system for student complaints in place along with support for social activities and alumni clubs.

Stakeholders Focus

The counterpart for customers in an HEI compared to other industries incorporates industry, community, society, alumni, professional organizations, accreditation boards, and students. While students, knowledge, abilities, and competencies are considered analogous to products. Thus, HEIs have various stakeholders and students take multiple roles (Karapetrovic, 2002). The difference in opinions while defining customers and other stakeholders pose a problem to TQM implementation. This can only be surpassed by applying systems thinking and understanding the broader requirements of key stakeholders involving graduates, employers, regulatory bodies, government, and funders. Systems thinking is about accounting for the needs of customers as well as other stakeholders while carrying out the business processes.

Research by Köksal & Eğìtman (1998) considered students, faculty members, and future employers of the students as the key stakeholders. While Local companies and department faculty are found as major stakeholders in a study by Aytaç & Deniz (2005). Nadim and Al-Hinai (2016) identified employees, students, society, industry, government, etc. as the principal stakeholders of an HEI. Additionally, they emphasized that awareness of the ever-changing expectations of these stakeholders along with regular review and updates of the stakeholders' needs is vital for an HEI to be successful.

Higher education has distinct groups of stakeholders, and each has its own perspective of what is considered as quality (Becket & Brookes, 2006). Students, parents, research sponsors, state and federal governments, future employers, the Accreditation bodies, and staff/faculty members are enlisted as the stakeholders in HEIs by (Quinn et al., 2009). Parents select the university, in

certain cases, pay for it and act as primary contact during some service interactions. While Students receive educational instruction, utilize administrative functions, and pay for the education service as well as auxiliary services like lodging, food, etc. Further, Research sponsors & the government supplies funds in exchange for information, service, or activities to the HEIs. Besides reaping the benefits from the services, they also have influence over service/product design in HEI, similar to the future employers, accreditation body, and the staff/faculty members do (Quinn et al., 2009). In the end, though students are recognized as the main customers in HEI, other stakeholders need to be considered to get a thorough insight into how quality is perceived in HEIs. Studying different stakeholders' points of view facilitates TQM implementation by providing better assessment and management of quality (Amal S. Shurair, 2017).

Faculty Satisfaction

Academic scholars are attracted to the professoriate for their longing to seek and produce novel knowledge and to share that information with others through instruction, collaborative research, and/or community engagement (Webber, 2019). Faculty plays a pivotal role in the overall success of a higher education institution as they are the drivers for students' learning and engagement, curriculum development, and research work (Benito & Scott-milligan, 2018). To adapt to increasing international competition HEIs need to improve the quality of higher education and raise their academic standards. For which, the institution needs outstanding faculty members. To attract and retain such academic staff the institution must provide competitive levels of work environment that is conducive to faculty needs. Dissatisfaction among faculty members will result in higher staff turnover, complaints, and decreased teaching and research productivity. While on the other hand, faculty satisfaction with the work environment promotes teaching quality and research (S. H. Chen, 2011).

The question of the satisfaction of faculty is relatively overlooked as most of the studies tend to evaluate educational services based on student satisfaction considering students as "customers". However, since employee satisfaction has been studied intensively in other industries, research on the quality of higher education has also now started to consider faculty satisfaction (L. & F.X., 2003). Different businesses have varieties of management models, business cultures, and employee requirements. Hence, the same measurement model cannot be applied to all kinds of businesses for measuring employee satisfaction. Thus, while assessing the faculty satisfaction in higher education a distinct approach should be adopted (Yang, 2003).

The questionnaires used in this study were based on studies found in the literature (Benito & Scott-milligan, 2018; Chen, 2011; Mamiseishvili & Lee, 2018; Stickney, Bento, Aggarwal, & Adlakha, 2019; Webber, 2019) along with discussions with faculty members. Flexibility, Pay and Benefits, Satisfaction with autonomy, Departmental Climate, Opportunity for development, and Management System were the dimensions used as the ground for generating the survey questions.

CHAPTER 4. RESEARCH METHODOLOGY

This chapter outlines the methodology utilized to accomplish the purpose of this study. The purpose of this study was to determine the interrelationship between soft TQM factors, faculty satisfaction, and student success. Specifically, to examine if an approach that emphasizes soft factors of TQM can be effective in assuring faculty satisfaction and if faculty satisfaction could, in turn, promote student success.

Source of Data and Sample Design

This study was cross-sectional and descriptive. For this study, the questionnaire was sent to the College of Engineering (COE) listserv using a combined approach similar to what is referred to as convenience and purposive sampling in the literature See. In the purposive sampling method also called judgmental sampling participants with the qualities that better suit the aims and objectives of the research are chosen deliberately (Etikan, 2016). While in the convenience sampling method data is collected from a source that is conveniently available to the researcher and is generally employed to identify tentative hypotheses or study objectives that can be used in more comprehensive studies (Stratton, 2021). It was assumed that COE would have better knowledge about TQM compared to other colleges of NDSU. After sending the survey request multiple times, responses that were collected within 1 month were analyzed.

The survey questionnaire used in the study for measuring soft TQM elements was designed by modifying the TQM instrument taken from a study by Bayraktar et al. (2008) (see Appendix A). Survey questions regarding faculty satisfaction were based on literature as well as discussion with faculty members (Benito & Scott-milligan, 2018; Chen, 2011; Mamiseishvili & Lee, 2018; Stickney et al., 2019; Webber, 2019) (see Appendix A). Additionally, Student success is measured by secondary data on Graduation Rate and Job Placement Rate extracted from the NDSU database.

Study Population and Sample Size

The study population of this study was faculty, staff, and graduate assistants in the College of Engineering, NDSU. The survey tool for soft TQM and faculty satisfaction was sent to the participants of the study and twenty-eight responses were received among them only twenty-five were complete. Out of 117 faculty members in COE 15 responded to the survey which gave us a faculty response rate of 12.8 %.

Method of Data Analysis

➢ Univariate Analysis: Descriptive statistics were completed. The variables were analyzed and presented as frequency and percentages.

➢ Bivariate Analysis: Cross-tabulation was completed to examine the relationship within the data. Fisher exact test was used for the bivariate analysis. Because of a lower number of responses to the survey Fisher exact test was chosen over Pearson's chi-square test for bivariate analysis. Also, to measure the reliability of the questionnaire in HEIs of USA correlation was measured for all questionnaires with Cronbach's alpha. The matrix thus presented will give the actual reliability of the tool used in this study.

Operational Variables

Dependent Variable

Faculty Satisfaction: The dependent variable of this study, "Faculty Satisfaction" was measured by 14 questions which were based on the following dimensions:

- Flexibility (2 items).

- Pay and Benefits (2 items).

- Satisfaction with autonomy (2 items).

- Departmental Climate (6 items).

- Opportunity for development (1 item).

- Management system(1Item).

The responses were categorized in Likert scale ranging from "strongly agree", "Agree", "Not applicable", "Disagree", "Strongly disagree" and the responses were re-coded as "Strongly agree/Agree" as '1', "Disagree/Strongly disagree" as '0', and "Not applicable" as '9'. The "Not Applicable" responses were not included in the study.

From a total of 14 questions relating to faculty satisfaction, a composite score was formed ranging from 0 to 14. The composite scores for all the scales were found to have left-skewed distribution, suggesting that a non-parametric analysis is more appropriate and that either median or the mode should be used as cutoff point (see Appendix C). However, due to the low response rate only the mean was suitable as a cutoff point for all the scales. Further, a final variable was created by using Mean as the cutoff point for differentiating 'satisfied' and 'unsatisfied' faculty satisfaction levels.

Student Success: Student success is measured by Graduation rate and Job placement rate which was secondary data extracted from the NDSU database.

The 6-year graduation rate of undergraduate students of each department of the college of engineering from cohort "2014-15" (student enrolled in 2014-2015) was used in this study. For analyses purposes a final graduation rate variable was created using the weighted mean of all departments as the cutoff point, differentiating the graduation rate of each department as "Above average" and "Below average".

Similarly, the corresponding job placement rate of each department of the college of engineering for years 2018, 2019, & 2020 was used in this study. The weighted average job placement rate of each department for all three years was calculated. Lastly, the final job placement

rate variable was created using the mean of all departments as the cutoff point, differentiating the job placement rate of each department as "Above average" and "Below average".

Independent Variable

Socio-demographic variables: Socio-demographic variables consist of Gender, Ethnicity, Department, and Role.

Gender: This variable has three groups Male, Female, and others. Further, for analysis purposes because of the inadequacy of data, the responses were re-coded as "Male" and "Non-Male". Where Non-male comprises of Females and other genders.

Ethnicity: Ethnicity is grouped into seven categories; White (not of Hispanic origin), Black/African American (not of Hispanic origin), Southeast Asian, Other Asian/Pacific Islander, Hispanic, Native American (American Indian or Alaskan Native), and Others. Further, for analysis purposes because of the inadequacy of data, the responses were re-coded as "White" and "Non-White". Where Non-white comprises of all other ethnicities besides "White (not of Hispanic origin)".

Department: This variable represents all the departments of the College of Engineering at NDSU. It comprises of 7 departments: Agricultural and Biosystems Engineering, Civil and Environmental Engineering, Computer Science, Construction Management and Engineering, Electrical and Computer Engineering, Industrial and Manufacturing Engineering, and Mechanical Engineering. Further, for analysis purposes because of the inadequacy of data, the responses were re-coded as "Mechanical Engineering department" and "Other Departments".

Role: Role refers to the type of position that the respondent holds in the College of Engineering. It is categorized into four categories: Faculty, Staff, Graduate Assistants, Others.

Further, for analysis purposes because of the inadequacy of data, the responses were re-coded as "Faculty" and "Non-faculty".

Soft TQM elements: It comprises seven Soft TQM factors: leadership, vision, employee involvement, recognition and rewards, education and training, student focus, and stakeholders focus. All the TQM elements were analyzed separately. The questions for each soft TQM element asked if the elements were effective or not effective in the college of engineering and individual departments of the respondent. The responses for all the soft TQM factors were categorized in Likert scale ranging from "strongly agree", "Agree", "Not applicable", "Disagree", "Strongly disagree" and the responses were re-coded as "Strongly agree/Agree" as '1', "Disagree/Strongly disagree" as '0', and "Not applicable" as '9'. The "Not Applicable" responses were not included in the study. Further terms "Effective" and "Not effective" were used to indicate the perception of respondents regarding the execution of soft TQM factors in their department. "Effective" would imply that the respondent thinks a particular soft factor is implemented in his department while "Not effective" would indicate the opposite.

Leadership: It comprises 8 questions relating to the leadership element of TQM. A composite score ranging from 0 to 8 was formed for leadership. Further, a final variable was created by using the mean as the cutoff point for differentiating leadership as "Effective" and "Not effective".

Vision: It comprises 6 questions relating to the Vision element of TQM. A composite score ranging from 0 to 6 was formed for vision. Further, a final variable was created by using the mean as the cutoff point for differentiating vision as "Effective" and "Not effective".

Employee Involvement: It comprises 6 questions relating to the employee involvement element of TQM. A composite score ranging from 0 to 6 was formed for employee involvement.

Further, a final variable was created by using the mean as the cutoff point for differentiating employee involvement as "Effective" and "Not effective".

Recognition and Reward: It comprises 4 questions relating to the recognition and reward element of TQM. A composite score ranging from 0 to 4 was formed for recognition and reward. Further, a final variable was created by using the mean as the cutoff point for differentiating recognition and reward as "Effective" and "Not effective".

Education and Training: It comprises 5 questions relating to the education and training element of TQM. A composite score ranging from 0 to 5 was formed for education and training. Further, a final variable was created by using the mean as the cutoff point for differentiating education and training as "Effective" and "Not effective".

Student Focus: It comprises 5 questions relating to the student focus element of TQM. A composite score ranging from 0 to 5 was formed for student focus. Further, a final variable was created by using the mean as the cutoff point for differentiating student focus as "Effective" and "Not effective".

Stakeholder Focus: It comprises 6 questions relating to the Stakeholder Focus element of TQM. A composite score ranging from 0 to 6 was formed for Stakeholder Focus. Further, a final variable was created by using the mean as the cutoff point for differentiating Stakeholder Focus as "Effective" and "Not effective".

Ethical Consideration

Before the data collection, approval for the study was obtained from the NDSU Institutional Review Board. A formal email with the information on data collection was sent to faculty, staff, and graduate assistants of the College of Engineering for consent and information about the study and its purpose.

CHAPTER 5. RESULTS

The results section of this thesis describes the frequency distribution of all the dependent and independent variables. It also examines the results of bivariate analysis using Fisher's exact test between socio-demographic variables & faculty satisfaction, Soft TQM factors & faculty satisfaction, and faculty satisfaction & Student success. The inferences and interpretations made from the analysis are explained in this section. Because of the small data size, Faculty Satisfaction was calculated using 1) only responses from faculty (Faculty-Only satisfaction) and 2) all responses, including those of staff and graduate assistants (faculty[+] satisfaction).

Descriptive Statistics

Table 3: Socio-Demographic Variables Distribution for All Responses

Variables	Category	Frequency	Percentage
Gender	Male	22	78.60%
	Non-male	6	21.40%
Ethnicity	White	15	53.60%
	Non-white	13	46.40%
Department	Mechanical Engineering Department	12	42.90%
	Other Department	16	57.10%
Role	Faculty	15	53.60%
	Non-faculty	13	46.40%

Table 3 details the relative percentage distribution of socio-demographic information among the respondents from the College of Engineering, NDSU. The majority of respondents were male constituting 78.6% of the total. Likewise, 53.6% of participants were of white ethnicity in the survey while all other ethnicities combined (termed as Non-white) only accounted for 46.4%.

The survey was forwarded to all the departments of the college of engineering, where the mechanical engineering department had the greatest number of respondents comprising 42.9% of the total respondents. Further, 53.6% of the respondents were faculty whereas 46.4% were non-faculty members consisting of graduate assistants and staff.

Table 4: TQM Soft Elements & Faculty[+] Satisfaction

Scales	Response	Frequency	Percentage
Leadership	Not effective	8	28.60%
	Effective	20	**71.40%**
Vision	Not effective	11	39.30%
	Effective	17	**60.70%**
Employee Involvement	Not effective	10	35.70%
	Effective	18	**64.30%**
Recognition and Reward	Not effective	13	46.40%
	Effective	15	**53.60%**
Education and Training	Not effective	11	39.30%
	Effective	17	**60.70%**
Student Focus	Not effective	10	35.70%
	Effective	18	**64.30%**
Stakeholder Focus	Not effective	12	42.90%
	Effective	16	**57.10%**
Faculty[+] Satisfaction	Unsatisfied	9	32.10%
	Satisfied	19	**67.90%**

Table 4 details the relative percentage of respondents saying whether the soft TQM factors are effective or not effective in the College of Engineering and their department. A higher number of respondents replied that the soft TQM factors were effective in the college of engineering and their department. Seven out of Ten respondents said the leadership factor was effective. While more than 60% of respondents said TQM factors: student focus, education and training, employee involvement, and vision were effective in their department. Further, 53.6% and 57.1% of respondents believed TQM factors recognition and reward, and stakeholder focus was established in the College of Engineering and their department. Similarly, 67.9% of participants were found to be satisfied as measured by faculty satisfaction questionnaires.

Cross-Tabulation of Dependent and Independent Variables

Table 5: Socio-Demographic vs Faculty[+] Satisfaction

Socio-Demographic variable	Category	Faculty[+] Satisfaction		P-Value
		Unsatisfied	Satisfied	
Gender	Male	28.57%	50.00%	0.6296
	Non-male	3.57%	17.86%	
Ethnicity	White	21.43%	32.14%	0.4348
	Non-white	10.71%	35.71%	
Department	Mechanical Engineering Department	7.14%	35.71%	0.2232
	Other Departments	25.00%	32.14%	
Role	Faculty	14.29%	39.29%	0.6891
	Non-Faculty	17.86%	28.57%	

Note: Fisher Exact Test

Table 6: Socio-Demographic vs Faculty-Only Satisfaction

Socio-Demographic Variable	Category	Faculty-Only Satisfaction		
		Unsatisfied	**Satisfied**	**P Value**
Gender	Male	26.67%	53.33%	0.516
	Non-male	0.00%	20.00%	
Ethnicity	White	13.33%	40.00%	1
	Non-white	13.33%	33.33%	
Department	Mechanical Engineering Department	0.00%	33.33%	0.231
	Other Departments	26.67%	40.00%	

Note: Fisher Exact Test

Table 5 shows the relationship between the socio-demographic variable and faculty satisfaction. Most of the respondents that are satisfied with their job are male. Almost one-third of nonwhite respondents were satisfied with their job than their counterparts. Approximately 36% of the respondents that were satisfied with their job were from the Mechanical department. Nearly 40% of the respondents that were satisfied with their job were faculty members. Looking at the p values, no significant relationship between the socio-demographic variable and faculty satisfaction was observed in this study. Also, the results in the faculty-only analysis show no link between socio-demographic variables and faculty satisfaction as shown in Table 6.

Table 7: Soft TQM Factors vs Faculty[+] Satisfaction

Soft TQM Factors	Response	Faculty[+] Satisfaction		p value
		Unsatisfied	Satisfied	
Leadership	Not effective	21.40%	7.10%	**0.0048****
	Effective	10.70%	**60.70%**	
Vision	Not effective	32.10%	7.10%	**0.0000*****
	Effective	0.00%	**60.70%**	
Employee Involvement	Not effective	25.00%	10.70%	**0.0028****
	Effective	7.10%	**57.10%**	
Recognition and Reward	Not effective	32.10%	14.30%	**0.0001*****
	Effective	0.00%	**53.60%**	
Education and Training	Not effective	25.00%	14.30%	**0.0104***
	Effective	7.10%	**53.60%**	
Student Focus	Not effective	25.00%	10.70%	**0.0028****
	Effective	7.10%	**57.10%**	
Stakeholder Focus	Not effective	28.60%	14.30%	**0.0012****
	Effective	3.60%	**53.60%**	

Note: Fisher Exact Test, *=< 0.05, **=<0.01, ***=<0.001

Table 8: Soft TQM Factors vs Faculty-Only Satisfaction

Soft TQM Factors	Response	Faculty-Only Satisfaction		p value
		Unsatisfied	Satisfied	
Leadership	Not effective	13.30%	6.70%	0.154
	Effective	13.30%	**66.70%**	
Vision	Not effective	26.70%	0.00%	**0.001**
	Effective	0.00%	**73.30%**	
Employee Involvement	Not effective	13.30%	13.30%	0.516
	Effective	13.30%	**60.00%**	
Recognition and Reward	Not effective	26.70%	20.00%	**0.026**
	Effective	0.00%	**53.30%**	
Education and Training	Not effective	13.30%	13.30%	0.516
	Effective	13.30%	**60.00%**	
Student Focus	Not effective	20.00%	13.30%	0.077
	Effective	6.70%	**60.00%**	
Stakeholder Focus	Not effective	20.00%	20.00%	0.235
	Effective	6.70%	**53.30%**	

Note: Fisher Exact Test p=< 0.05

Table 7 infers that all the soft TQM elements: leadership, vision, employee involvement, recognition and reward, education and training, student focus, stakeholder focus are significantly associated with faculty[+] satisfaction. In the case of leadership and vision, over 60% of respondents were satisfied with their job and said these elements of TQM were functional in the College of Engineering and their department. Similarly, for all other factors, more than 50% of respondents were satisfied and said the factors were established. Further, considering the p values, vision and recognition and reward has been shown to have the most significant association with faculty[+] satisfaction, followed by leadership, Employee involvement, student focus, & stakeholder focus. While the p value corresponding to Education and Training shows the least significant association with faculty[+] satisfaction among all soft TQM elements. Besides, the faculty-only analysis as shown in Table 8 depicts that only vision, and recognition & rewards have a significant relationship with faculty satisfaction which goes along with the overall analysis where these elements are found to be most significantly associated.

Reliability of Survey Tool

Table 9: Cronbach's Alpha for Internal Consistency of the Survey Tool

Scales	Number of Items	Cronbach's alpha
Leadership	8	0.658
Vision	6	0.643
Employee Involvement	6	0.917
Recognition and Reward	4	0.89
Education and Training	5	0.876
Student Focus	5	0.422
Stakeholder Focus	6	0.843
Faculty Satisfaction	14	0.901

Cronbach's Alpha is a measure of internal consistency, which measures how closely related a set of items are as a population. Testing the reliability of the survey tool implies measuring for homogeneity of individual items of the survey. The numbers gauge the ability of the survey to

produce identical outcomes in multiple trials. In this study, Cronbach's alpha was calculated for each scale: all individual soft TQM elements and Faculty Satisfaction. Though for concluding a scale to be internally consistent an alpha value higher than 0.70 is considered as standard, according to Nunnally (1978) for early stages of research the alpha value of 0.50 and 0.60 is also acceptable (Bayraktar et al., 2008). As shown in Table 7 all the scale measures are over 0.5 except for "Student Focus". In the case of "Student Focus" the reason for a lower value of alpha signifies poor interrelatedness between the questions. Which could be a call for rephrasing or modifying the questionnaires under "Student Focus". Overall, Table 7 confirms the satisfactory level of internal consistency of the scales being studied, considering the study is a preliminary study of its kind.

Cross-Tabulation of Faculty Satisfaction and Student Success Variables

Table 10: Faculty[+] Satisfaction vs Graduation Rate

		Graduation Rate		P value
		Below-average	Over-average	
Faculty Satisfaction	Unsatisfied	25.00%	7.10%	**0.01**
	Satisfied	14.30%	**53.60%**	

Note: Fisher Exact Test

Table 11: Faculty[+] Satisfaction vs Job Placement Rate

		Job placement rate		P value
		Below-average	Over-average	
Faculty Satisfaction	Unsatisfied	28.60%	3.60%	0.098
	Satisfied	35.70%	32.10%	

Note: Fisher Exact Test

Table 8 shows the relationship between faculty[+] satisfaction and graduation rate. It was found that more than 50% of the faculty that were satisfied had an "over-average" graduation rate in their department. The p-value indicates a significant positive link between faculty[+] satisfaction and graduation rate. This could suggest that if the faculty are satisfied better graduation rate is

more likely to be achieved. Similarly, the connection between faculty[+] satisfaction and job placement rate was also looked upon but no significant association was observed as shown in Table 11. This might denote that faculty[+] satisfaction is of lesser importance among various factors that affect the employment possibility of a student.

Discussion

The purpose of this study was to examine the interrelationship between soft TQM factors, faculty satisfaction, and student success. Analyzing the survey results, all the soft TQM factors were found to have a significant positive relationship with faculty[+] satisfaction. This result matches previous studies done in manufacturing and other service industries found in the literature. Chaichi & Chaichi (2015) found that human resource practices focused on TQM such as employee empowerment, employee training, Appraisal system, Compensation system would improve employee satisfaction in small and medium enterprises in Iran. Similarly, Arsić et al. (2012) did a study in Serbian manufacturing industries having implemented TQM philosophy in their organization, found that soft TQM factors: top management commitment, employee training, teamwork, job evaluation, and employee compensation, have a positive impact on employee satisfaction and loyalty. Likewise, Jun et al. (2006) studied the impact of HR-related TQM factors on employee satisfaction and loyalty in multinational companies located in Mexico which endorsed that HR-related TQM factors are crucial for employee satisfaction which would further lead to employee loyalty. Additionally, a study carried out by Chang et al.(2010) with the government of Taiwan showed that Soft TQM factors can enhance employee satisfaction which in turn can create employee loyalty.

Looking at the individual soft TQM elements considered in this study, Vision, and Recognition & Reward were found to be most significantly associated with faculty[+] satisfaction,

followed by leadership, employee involvement, student focus, and stakeholder's focus. While education and training was found to be least associated with faculty[+] satisfaction. The reason behind the weaker link between Training and education and faculty[+] satisfaction could be because the faculty members being highly educated did not consider or expect any further training and education from the institution where they are employed. A higher significant association between "Recognition and reward" and faculty[+] satisfaction found in this study matched with the finding of Chaichi & Chaichi (2015) where the analogous factor "Appraisal System" had a more significant relationship with employee satisfaction than other factors. Similarly, a significant relationship between "Leadership" and faculty[+] satisfaction was also in line with the results of Arsić et al. (2012) and Chang et al. (2010) where the corresponding factors "Top management commitment", "Management Leadership" were found to be the significant predictor of employee satisfaction. Likewise, the significant link between "employee involvement" and faculty[+] satisfaction is also supported by the study done by Hwang, Yoon, & Choi (2020) where the parallel TQM factor "employee empowerment" was found to lead to positive employee outcomes i.e. increased organizational commitment and reduced turnover intention. Moreover, Soft TQM factors; Vision, student focus, and stakeholder's focus were found as critical success factors in HEIs, and in this study, they were found to be significantly linked to faculty[+] satisfaction as well (Asif et al., 2013, Bayraktar et al., 2008). Further, looking at the relationship between faculty[+] satisfaction and student success, faculty[+] satisfaction was found to be positively linked with graduation rate indicating that departments having satisfied faculty are more likely to achieve better graduation rates. This gives us a hint that faculty satisfaction may enhance student success.

CHAPTER 6. CONCLUSION

After contemplating the descriptive statistics & bivariate Fisher exact test, the study has concluded that there is a significant relationship present between the Soft TQM factors and Faculty Satisfaction. Since the start of TQM implementation in HEIs, the ongoing argument regarding the suitability of TQM in the higher education scenario has been very concerning. Which is the reason why HEIs have not been able to derive the benefits of TQM like manufacturing industries. The point of discussion was centered on seeking a TQM approach that would perfectly fit HEIs. This study indicates that focusing on soft TQM factors and encouraging its widespread implementation throughout the institution has the likelihood of enhancing faculty satisfaction. Also, this study is a pioneer in its field as no such research was conducted linking TQM factors, faculty satisfaction, and student success in HEIs. A modified soft TQM instrument based on the instrument developed by Bayraktar et al. (2008) was used to access the faculty's perception of TQM implementation in the College of Engineering at NDSU. Faculty satisfaction was assessed by using questionnaires based on factors: Flexibility, Pay and Benefits, Satisfaction with autonomy, Departmental Climate, Opportunity for development, Management system. The results showed that the faculty who perceived that the soft TQM factors were effective in their department and College of Engineering were more satisfied than those who said the factors were not effective. This shows a clear link between soft TQM factors and faculty satisfaction. In Addition, faculty satisfaction was found to be positively linked with graduation rate indicating that departments with satisfied faculty are more likely to achieve better graduation rates.

Faculty play a critical role in the success of a student and can be considered the backbone of an HEI. They are the ones responsible for imparting knowledge to the students and preparing them for the future. Implementing Soft TQM factors is crucial in assuring that the faculty in an

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HEI are satisfied and motivated to achieve organizational success. Further, we can say with satisfied faculty better student success outputs can be achieved. Thus, this study recommends a TQM approach that focuses on people aspects or "soft factors" which enhance faculty satisfaction and in turn may result in student success.

Limitations of the Study

One of the major limitations of this study is the low response rate. There could be multiple reasons behind the low response rate, because of the global pandemic situation faculty and staff have been overwhelmed with various changes such as switching to online classes, and the inability to perform on-campus research work. Besides, as the survey was carried out during the summer session, a lot of professors were off-campus and were not available to participate in the survey. Also, since summer is shorter-term and faculties are usually in a rush to complete the course work, this may have caused a lower response to the survey. Additionally, analysis based on socio-demographic variables was not significant in this study because of the lower response rate.

One additional potential limitation of this study is that because not all respondents of this survey have similar knowledge about the TQM philosophy, it is possible that they might misinterpret the questions which could affect their answers to some questions. Also, some questions were asked about the College of Engineering while some were focused on the individual department which might also have created confusion for the respondents.

Moreover, the data used in this study was collected only from the college of engineering of NDSU, which limits the generalization of findings. Thus, this study should be tested in a broader population to get to better generalizable conclusions.

In this study, the Likert scale was re-coded into dichotomous responses for gaining interpretability of the low amount of data received (see Appendix B). Also, during the re-coding

of data, the "Not Applicable" responses were not included and only the responses that indicated a preference as agree or disagree were included. Nevertheless, it cannot be denied that all these modifications done with the data might result in losing information. Additionally, because of the low response rate, only the mean scores were suitable to be used as cutoff points for converting the composite scores of each scale into categorical values. This restricted the use of the median or mode as cutoff points which would have been more appropriate for the scores with left-skewed distribution as observed in this study. Thus, not being able to utilize the proper cutoff point selection method based on the distribution of the composite scores is an important limitation of this study.

Recommendations for Future Research

Recommendations for further research contain ideas based on the results and shortcomings of this research. There are several aspects of this study that can be improved and further researched, which are as follows:

- This study might be replicated with a better timing for sending the survey questionnaires which may improve the response rate.

- Carrying out an institution-wide study involving all the colleges of a university may provide findings that could be generalized for the whole institution.

- This study might be replicated with modified questionnaires that could be better understood by someone with no knowledge of TQM philosophy might result in a better response rate and credibility.

- This study might be replicated with a mixed method of data collection such as individual interviews and focus groups to compensate for the lack of representation of underrepresented minority groups.

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APPENDIX A. SURVEY INSTRUMENT

Socio-Demographic Information

1) What is your gender?

   a. Male   b. Female   e. Other Please Specify_____

2) What is your race/ethnicity? Check all that apply.

a) Southeast Asian   e) Other Asian/Pacific Islander

b) Black/African American, not of Hispanic origin   f) Hispanic

c) Native American (American Indian or Alaskan Native)   g) Other, please specify: _____

d) White, not of Hispanic origin

3) Department

a) Agricultural and Biosystems Engineering   b) Civil and Environmental Engineering

c) Computer Science   d) Construction Management and Engineering

e) Electrical and Computer Engineering   f) Industrial and Manufacturing Engineering

g) Mechanical Engineering

4) Role

   a) Faculty   b) Staff   c) Graduate Assistant   d) Other: _____

   How do you agree with the following statements?

Scale 1: Leadership

1. Leaders of the NDSU College of Engineering are knowledgeable about what constitutes quality in higher education institutions.

   a. Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

2. Leaders of the NDSU College of Engineering actively participate in and promote activities that support the improvement of teaching and research quality.

   a. Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

3. The leaders of my department are aware of changes such as the development of new skills and working modality that are needed for improving teaching and research quality.

a.   Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

4. The leaders of my department strongly encourage and empower the employee to involve in quality improvement initiatives regarding teaching and research.

a.   Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

5. Leaders of the NDSU College of Engineering allocate adequate resources for academic and administrative employee education and training.

a.   Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

6. The leaders of my department discuss teaching and research quality-related issues in their management meetings.

a.   Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

7. Leaders of my department value high-quality teaching and learning to improve the performance of students and faculty apart from relying on financial criteria.

a.   Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

8. Leaders of the NDSU College of Engineering are dedicated to the continuous improvement of teaching and research, not just one-step improvement to an acceptable level.

a.   Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

Scale 2: Vision

1. The NDSU College of Engineering has a clear written vision statement.

a.   Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

2. The vision of the NDSU College of Engineering is widely known and shared in my department.

a.   Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

3. The vision of the NDSU College of Engineering effectively encourages staff to improve the performance of our students and our institution.

a.   Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

4. Academic and administrative processes in my department are well aligned with the vision of NDSU College of Engineering.

a.   Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

5. My department has well-defined academic and administrative processes and performance measures as well as policies.

a. Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

6. Employees from different levels are involved in developing our departmental policies and plans.

a. Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

Scale 3: Employee involvement

1. In my department there is the active involvement of faculty members and staff in quality improvement initiatives regarding teaching and research.

a. Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

2. Our department strives for greater active cooperation from the faculty members & staff rather than just compliance.

a. Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

3. The NDSU College of Engineering has multi-disciplinary teams and supports teamwork.

a. Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

4. Our department has an established Faculty and staff suggestion system to improve the departmental processes.

a. Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

5. Recommendations from all staff and faculty members are carefully evaluated and enacted as appropriate in our department.

a. Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

6. Faculty members and staff in our department are very committed to achieving the teaching and research quality goals of the NDSU College of Engineering.

a. Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

Scale 4: Recognition and reward

1. Our department has a reward program to praise the quality improvement efforts of faculty members and staff fairly and to stimulate their commitment towards the mission of NDSU College of Engineering.

a. Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

2. Our department has transparency in selection criteria for rewards along with standard and clear procedures to evaluate the performance level of faculty members and staff.

a. Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

3. Recognition and reward activities effectively enhance the correspondence between quality improvement practices and the performance of faculty members and staff.

a. Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

4. The reward system in the NDSU College of Engineering is equally balanced between achievement in research as well as teaching.

a. Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

Scale 5: Education and training

1. Special training offered by NDSU for work-related skills is provided to all the faculty members and staff.

a. Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

2. The NDSU College of Engineering encourages education and training activities of the faculty members and staff for broadening their knowledge and skill.

a. Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

3. Our department organizes training on teaching and research quality improvement for faculty members and staff and encourages their participation.

a. Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

4. Our department provides faculty members and staff with professional development opportunities on campus and financial support for off-campus training and education when needed.

a. Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

5. Faculty members and staff themselves play an active part in identifying their training needs.

a. Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

Scale 6: Student focus

1. Our department collects student feedback and evaluates the data carefully.

a. Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

2. Our department conducts a course evaluation survey for every course taught in each semester.

a. Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

3. Our department supports student clubs and their activities.

a. Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

4. The NDSU College of Engineering has some organized efforts on effective student lifecycle management for their business life and personal development after graduation.

    a. Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

5. The NDSU College of Engineering concentrates on the student's needs while establishing the learning standards for the accomplishment of their desired student learning outcomes.

    a. Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

Scale 7: Other stakeholders' focus

1. Our department collects complaints and feedback from faculty members & staff and evaluates them carefully.

    a. Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

2. The NDSU College of Engineering takes into consideration the changing needs of society and future employers.

    a. Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

3. The NDSU College of Engineering studies different stakeholders' point of view to better assess and manage the quality of the College.

    a. Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

4. Research sponsors and the government have control over service/product design in the NDSU College of Engineering.

    a. Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

5. Our department has some organized efforts to identify the academic and administrative needs of our faculty members and staff.

    a. Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

6. The NDSU College of Engineering has some organized efforts to understand the expectation of industry regarding our graduates.

    a. Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

Faculty Satisfaction

1. In our department, there is Flexibility to distribute tasks and intensity according to faculty needs.

    a. Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

2. In my role at NDSU, I am satisfied with the balance between professional and personal life.

    a. Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

3. I am satisfied with the monetary rewards and incentives provided through my employment at NDSU College of Engineering.

    a. Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

4. I am satisfied with the health and retirement benefits offered through my employment at NDSU College of Engineering.

    a. Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

5. I have discretion to choose the course content for the classes I teach.

    a. Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

6. I have complete control over the focus of my research/scholar work.

    a. Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

7. My department colleagues are committed to supporting and promoting diversity and inclusion.

    a. Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

8. My department formally recognizes the efforts of faculty members and staff.

    a. Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

9. Teaching practices in my department are ideal for mentoring the students.

    a. Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

10. I feel my ideas are considered for decision-making in my department.

    a. Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

11. My department has availability of enough funds to do research.

    a. Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

12. I am happy to be a part of this institution and feel it is a good place to work.

    a. Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

13. My department provides opportunities for personal growth and development.

    a. Strongly Disagree   b. Disagree   c. Agree   d. Strongly Agree   e. Not Applicable

14. NDSU College of Engineering has the appropriate provision of a fair promotion system and transparent systems of rewards and penalties.

    a. Strongly Disagree b. Disagree c. Agree d. Strongly Agree e. Not Applicable

1. Please share your views on how the College of Engineering can improve faculty satisfaction by focusing on the Soft TQM factors (people, culture, and management).

_____

_____

_____

2. Please share your views on the impact of faculty satisfaction on student success.

_____

_____

_____

APPENDIX B. CODING RULES

Likert Scale	Strongly Agree/ Agree	1
	Strongly Disagree/ Disagree	0
	Not applicable	9

Gender	Male	1
	Female	2
	Other, Please Specify	3

Ethnicity	White, not of Hispanic origin	1
	Hispanic	2
	Southeast Asian	3
	Other Asian/Pacific Islander	4
	Other, Please Specify	5

Department	Mechanical Engineering	1
	Computer Science	2
	Industrial and Manufacturing Engineering	3
	Agricultural and Biosystems Engineering	4
	Electrical and Computer Engineering	5
	Civil and Environmental Engineering	6

Role	Faculty	1
	Staff	2
	Graduate Assistant	3
	Other	4

APPENDIX C. DISTRIBUTION OF COMPOSITE SCORES

Leadership Composite Score

Bin	Frequency
[2, 3.5]	2
(3.5, 5]	3
(5, 6.5]	0
(6.5, 8]	20

Vision Composite Score

Bin	Frequency
[0, 1.5]	2
(1.5, 3]	3
(3, 4.5]	2
(4.5, 6]	17

Education and Training Composite Score

Bin	Frequency
[0, 1.5]	4
(1.5, 3]	4
(3, 4.5]	3
(4.5, 6]	14

Employee Involvement Composite Score

Bin	Frequency
[0, 1.5]	4
(1.5, 3]	3
(3, 4.5]	0
(4.5, 6]	18

Recognition and Reward Composite Score

Bin	Frequency
[0, 1]	8
(1, 2]	2
(2, 3]	3
(3, 4]	12

Student Focus Composite Score

Bin	Frequency
[0, 1.5]	1
(1.5, 3]	6
(3, 4.5]	4
(4.5, 6]	14

Stakeholder's Focus Composite Scores

Faculty Satisfaction Composite Score