



The Role of the Total Quality Management Strategy to Improve the E-Learning System in Light of Climate Changes for a Sustainable Educational System for Higher Education Institutions

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ABSTRACT

This study examines the relationship between the Total Quality Management Strategy (STQM) variable and the E-Learning System (ELS) variable in the context of climate change. The aim is to develop a sustainable educational system and effectively incorporate technological improvements at the University of Kufa. This will be achieved by surveying the perspectives of various individuals. The teaching staff at the university and its colleges used the random sample approach and utilized statistical tables to investigate the population of 2262 teaching staff members. The study determined that the ideal sample size comprises 327 teaching staff members. Of the sent surveys, 20 were not received, and 12 were incomplete. Therefore, 295 questionnaires that met the criteria were used for statistical analysis. The findings demonstrated a considerable and favorable impact of the entire quality management approach on the e-learning system. We found that implementing comprehensive quality control in the e-learning system is efficacious and should be used. The effectiveness of the e-learning system in higher education depends on implementing comprehensive quality management. Several suggestions have been put forth to enhance the standard of higher education in Iraq and establish a sustainable educational system amidst the challenges posed by climate change. When formulating comprehensive strategic plans for quality management, all faculty members must exert maximum effort in attaining total quality management. This can be achieved by contributing beneficial ideas and implementing advanced educational programs while adapting academic curricula to anticipate the effects of climate change.

Keywords: Total Quality Management Strategy, E-Learning System, Weather Changes, Sustainable Education System, Higher Education.

INTRODUCTION

The difficulty of ensuring high-quality education is a significant issue in numerous countries worldwide, especially concerning climate change (Cross & Congreve, 2021). The effectiveness of educational institutions depends on the quality of education they offer, and educators, policymakers, scientists, and researchers exhibit their sincere excitement for Total Quality Management (TQM). This study evaluates the unity between the overarching quality management and the e-learning system within the climate change framework. Therefore, numerous years ago, efforts were made to ensure everyone achieves a high-quality education. Teaching staff have received training to improve efficiency and develop inventive teaching curricula in response to climate change.

Over the past few years, there has been a significant surge in the creation and utilization of multimedia applications and technologies, resulting in a profound impact on people's lives. Each individual seeks a quality education. Quality, being the benchmark for excellence, cannot be surpassed since it serves as the criteria by which the final products are evaluated for adherence to the standards. To get a high-quality education, it is necessary to have effective management that ensures adherence to precise standards. This concept of adhering to specifications was introduced by Peters and Waterman in 1982 as part of their pursuit of perfection (Collins, 2023). Higher education institutions should prioritize the implementation of e-learning as a vital and adequate substitute for traditional education in light of climate change. Climate change is a pressing concern that the United Nations has prioritized for sustainable development (A. Almagtome, Khaghaany, & Önce, 2020). It is widely recognized as one of the most critical challenges confronting our society today. Given the increasing pace of greenhouse gas impacts worldwide, it is imperative to equip education institutions with modern tools to establish a sustainable educational system and effectively address and reduce the long-term consequences of climate change. Higher education institutions need to develop a comprehensive strategy for quality control to construct a long-lasting education system in the face of climate change. Sustainable development emerged within the environmental realm and refers to pursuing development that meets the present generation's needs while protecting future generations' interests (Davis, 2010). Over the past few years, this concept has been widely acknowledged and has evolved into a holistic framework encompassing four key aspects: society, economy, politics, and natural environment (Davis, 2012). Education has a crucial role in the social structure. Therefore, the sustained advancement of education is crucial for the sustainable advancement of society (Ryan, Tilbury, Corcoran, Abe, & Nomura, 2010). Education can address societal changes by modifying individual attitudes, actions, and lifestyles by raising awareness and enhancing capabilities (Sarabhai, 2015). However, education not only prevents the passing down of poverty from one generation to another and aids in the reduction of inequality, but it also plays a crucial role in promoting peaceful societies (A. H. Almagtome, Al-Yasiri, Ali, Kadhim, & Heider, 2020). Considering this context, there is a growing recognition of the importance of sustainable development in education. At the macroscopic level, the focus is on accurately defining the concept of "sustainable development in education." Sustainable development in education, or Education for Sustainable Development (ESD), is a concept aimed at holistically overhauling educational systems globally. Its objective is to foster and instill sustainability in future generations' thoughts, emotions, and behaviors. Expanding upon this comprehension, Leicht, Heiss, and Byun (2018) emphasize creating high-quality systems to ensure the sustainable growth of societies worldwide. Experts have emphasized the significance of higher education institutions regarding sustainable educational growth. Therefore, the support and involvement of higher education institutions are essential for achieving long-term advancement in education. To accomplish this objective, it is crucial to incorporate the sustainable development paradigm within the university curriculum (Alvarez-Herrero & Hernández Ortega, 2020). Furthermore, the substance of courses, instructional approaches, and establishing internal procedures inside higher education institutions serve as crucial avenues for sustainable educational development.

LITERATURE REVIEW

The Strategy of Total Quality Management

The term "quality" is derived from the Latin word "Qualis," which directly means "quality." Furthermore, it possesses numerous interpretations, and the concept of quality is subject to constant change. According to Da Costa, Papa, Lisboa, Munoz, and de Albuquerque (2019), quality is a management method that promotes engagement, fulfills needs and upholds values and beliefs to attain success. Long-term quality management can be described as consistently executing planned tasks precisely. Hence, it is an administrative principle that seeks to consistently enhance products and services, as well as procedures, by prioritizing the requirements and anticipations of employees. Total quality management is the attainment of collaboration and efficiency among personnel. Aside from efficiency and adherence to proper procedures, one of the main reasons for focusing on comprehensive quality management is the need to address educational reform and development obstacles. These obstacles include rapid advancements in science, technology, and information, increased media openness, and the cultural impact of the communications revolution and information flow. Additionally, there is a growing emphasis on enhancing performance quality. Promoting innovation, rejuvenation, and enhancing employees' competencies align with the future's vision, advancements, and obstacles. Hence, implementing quality management in higher education institutions is not a mere indulgence but a pressing must (Al Sharaya & Bazadough, 2022). Abbas (2020) introduced the notion of a comprehensive quality management approach. Good education necessitates effective management and the implementation of quality indicators, strategies, and a roadmap for quality management. These components are established through adopting a whole quality management plan, which

comprehensively measures the institution's overall performance. The concept of quality in higher education extends beyond performance and encompasses the quality of inputs, including students, teachers, educational resources, and leadership qualities of the director. These factors are implemented by employees, teachers, and senior leaders in their respective fields to achieve optimal outcomes. Our success in attaining our goal in light of climate change is directly proportional to the sincerity with which we apply quality management techniques (A. Almagtome & Abo-aljun, 2023; Dhal, 2020). It is necessary to transition from conventional management to overall quality management. Deming asserts that total quality management is a philosophical approach that necessitates a profound cultural shift from conventional management to a continuous improvement management style within an organization. Implementation of whole quality management can facilitate enhancement. To address the challenges posed by climate change, academic institutions must embrace a more teacher-centric approach characterized by ongoing, transparent communication, evidence-based problem-solving, and informed decision-making. Various tools and techniques are accessible within the realm of overall quality management. Therefore, it is imperative to prioritize the selection of tools and technologies that align with the needs of higher education institutions (Sohel-Uz-Zaman, 2016).

Dimensions of the Total Quality Management Strategy

These dimensions can be explained as follows:

The Commitment of Senior Management

The senior management team initiates the implementation of total quality management and sets forth values and objectives to fulfill employee expectations. This leads to improved performance, as management sets quality policies, sets and disseminates quality objectives, provides resources and provides training directed towards problem-solving and improvement to obtain total quality management strategies. Senior management must evaluate and participate to improve performance and obtain an adequate result because senior management's commitment is closely related to total quality management (Olusanjo, 2019).

Implementing total quality management in education yields superior outcomes across all aspects of the educational process, as it is a proven and effective management approach. Total quality management can help universities provide the best services to students and teachers. Operating the total quality management system without fear with a focus on growth Continuous improvement provides more excitement and challenge for students and teachers than an educational environment can provide without a comprehensive quality management strategy (Farooq, Akhtar, Ullah, & Memon, 2007).

Training and Education

Training and education are the primary goals in the total quality management strategy, as it focuses on acquiring knowledge and development during service. Therefore, it is essential to establish a mechanism for continuous training for teaching staff and employees (Marchiori & Mendes, 2020). It is essential to train Those responsible for quality management for higher education institutions to impose their role in the quality improvement program and understand each step enough to explain to their employees that training will lead to good performance and provide better results in all areas of education procedures. A prominent position in higher education institutions, both in the public and private sectors, can be achieved by implementing complete quality management. Implementing Total Quality Management in higher education institutions can enhance the delivery of services to both students and universities. Focusing on training and education for Total Quality Management is an essential way to fulfill the rules of shared responsibility in education reform, and this, in turn, leads to continuous reinforcement, which enhances motivation and challenge for students. And teachers, which is more than what a solid educational environment can provide (Karim, 2021).

Participation of All Employees

Employee engagement in total quality management enables employees to make administrative decisions autonomously and enhance their organizational activities. McGregor's Theory Y introduced the concept of participatory management to managers. Since then, several models and ways have been developed to promote employee participation, such as job design and distinctive activities. These include initiatives that focus on improving the quality of educational institutions (Al Sharaya & Bazadough, 2022; Ali, Jabir, Almagtome, & Kadhim, 2023).

Ensuring the involvement of all employees in higher education institutions will result in a perpetual enhancement of the educational process. It will enable more opportunities for practicing and achieving performance excellence, specifically producing high-quality results. Additionally, it will enhance the quality of decision-making and problem-solving processes, thus contributing to scientific achievement. A quality culture can only be created and maintained by prioritizing employee involvement at all stages. Employee participation in

various activities also allows them to improve their abilities and increase their knowledge base, which makes them confident in expressing their creativity and problem-solving skills (Martz, Hughes, & Braun, 2017).

Continuous Improvement

The concept of continuous improvement was initially proposed by Deming in 1993 and is commonly referred to as the Deming cycle, as stated by Afrin, Islam, Fontaine, Ali, and Rahman (2019). Continuous improvement fosters attaining universities' objectives, fulfilling stakeholders' expectations, and the development of suitable and efficient approaches. The process of continuous improvement commences with the formulation of a plan rooted in identifying areas requiring enhancement. Subsequently, the intended improvements are subjected to rigorous testing. Subsequently, the outcomes are analyzed, and a determination is reached regarding the necessary course of action. Continuous improvement is a fundamental principle of comprehensive quality management. It is an ongoing process that centers on connecting with other components and influencing the organizational environment. It is a crucial factor in enhancing productivity. Continuous improvement is the process of implementing complete quality management in institutions. Higher education is a deliberate and substantial process that enhances student performance, fosters creativity, and promotes development (Khurniawan, Sailah, Muljono, Indriyanto, & Maarif, 2020).

The Significance of the Online Educational System

The rising number of users and the need to adapt to unforeseen circumstances or climate changes have made e-learning the favored approach to education in the future. The constructed digital learning environment can optimize the educational process by accommodating the student's timing, location, and pace preferences. These platforms can potentially augment student engagement and result in improved educational outcomes and heightened levels of satisfaction and efficacy. E-learning is a cutting-edge technology that enhances traditional education systems through electronic applications and virtual learning environments. Utilizing information and communication technology in different educational processes enhances the quality of education in higher education institutions. It facilitates the acquisition of sustainable education in the context of climate change. The classroom can be traditional, online, or combined (Dima, Bugheanu, Boghian, & Madsen, 2022). E-learning in universities is a significant challenge for educational institutions worldwide. The e-learning system must be equipped with a set of needs, which can be both objective and subjective, as outlined below:

Providing many computers, communication networks, and electronic libraries.

Providing many educational programs for education management applications and control systems.

Training and learning of university professors and students in skills related to communications technology and educational programs.

Providing personnel capable of operating and maintaining equipment related to information technology.

The primary obstacles to e-learning are inadequate information technology and infrastructure, deficiency in technical expertise, and financial limitations. E-learning becomes increasingly essential when climate change, war, or health crises occur (Salahshouri et al., 2022). An integral part of the academic strategy involves a specific method for ensuring the quality of e-learning. This approach encompasses the following components:

The educational institution establishes the strategic plan for the overall development of its online education system and formulates plans for its scientific and administrative departments.

The educational institution determines a plan that includes options for using the online education system in teaching.

It is essential that the plans of the teaching staff aim to achieve the best requirements of the students by providing options for the online education system or blended learning (Kear et al., 2016).

Dimensions of Online Education System

The quality assessment of the e-learning system is complicated due to its reliance on several stakeholders, such as learners, teaching staff, technical and administrative staff, and the Internet and other technologies. Ozkan and Koseler (2009) conducted recent studies that have identified the aspects, best practices, guidelines, and standards necessary to guarantee the quality of e-learning systems in various situations. From the information provided above, these dimensions can be further elucidated as follows:

Support

Support refers to the provision of aid in implementing the e-learning system program, encompassing activities such as marketing, technology platforms, promotion, administrative reporting, infrastructure, technical and executive assistance, and the design and customization of an e-learning platform. Hence, the absence of

knowledge or assistance in universities might result in numerous issues between academics and students. Today, technical assistance substantially influences academics and students' utilization of technology as it improves the functionality of the e-learning system, facilitating the integration of information technology into the educational system (Jung, 2011). Higher education institutions must provide the teaching staff with modern technology tools and psychological support. To increase awareness of the importance and benefit of information technology in education through appropriate financial incentives (Arkorful & Abaidoo, 2015). Supports students and teaching staff by the educational institution is crucial to overcoming the barriers to education, and supporting the quality of education in a sustainable educational system manner confirms Future generations will reap many benefits, so support plays a crucial role in accepting the e-learning system (Rotar, 2022).

Satisfaction

The fundamental goal of every educational institution is to understand the needs of students and educational staff and satisfy them quickly to achieve high-quality education. Ensuring student satisfaction is a challenging endeavor. Developing techniques to ascertain kids' needs is crucial (Domini & Palumbo, 2013). Teacher satisfaction is essential for assessing educational outcomes as it enhances quality and significantly impacts education. The long-term acceptance of the e-learning system may be influenced by the level of contentment experienced by teachers. Consequently, the use of e-learning systems rises in tandem with growing contentment. According to the information provided, it has been acknowledged that pleasure plays a crucial role in motivating teachers and students to enhance the ongoing utilization of e-learning systems worldwide. We conducted a study to assess student satisfaction and the quality of services provided to improve academic life and ensure high standards in higher education. This involved creating a new administrative model based on educational procedures to achieve satisfaction and enhance decision-making processes (del Carmen Olmos-Gómez, Suárez, Ferrara, & Olmedo-Moreno, 2020).

Electronic Readiness

The institution could generate and utilize digital data to enhance economic activities and make preparations for e-learning. The most crucial factor in attaining success in the e-learning system is widely regarded as this. The term "readiness" emerged as a response to assessing users' technological, organizational, and social preparedness for implementing the e-learning system (Farazkish & Montazer, 2019). Implementing e-learning at higher education institutions to align with global trends necessitates a prepared environment, as readiness is crucial for successfully integrating e-learning in these institutions. The concept of e-readiness involves effectively capitalizing on suitable chances and enhancing the e-learning process (Odunaike, Talabi, Laoye, Akinyemi, & Obasan, 2022). The notion of e-readiness has gained prominence due to the rapid proliferation of information technology (IT) and notable advancements in diverse domains.

Performance

Performance is the encompassing term for all educational practices aimed at achieving goals, which covers all educational activities and procedures. E-learning quality of e-learning is deemed satisfactory when it undergoes testing, performance assessment, and further enhancements to the system and its functionality. This assessment is crucial in gauging the caliber of e-learning delivery (Lueg, 2014). Performance means work that can be measured, and performance is measured through e-learning systems to save time, effort, and money and facilitate communication processes with others. The relationship between efficiency and educational success is intrinsically connected regarding inputs and outcomes. It enhances the global e-learning system. Performance has been examined and ascertained from many viewpoints (Sewandono, Thoyib, Hadiwidjojo, & Rofiq, 2023).

Infrastructure

There is a growing interest in IT infrastructure services essential to organizational outcomes and growth. IT infrastructure services are defined by Broadbent, Weill, and Neo (1999) as "the core IT capability of both technology and human resources. These are shared throughout the organization through reliable and centrally coordinated services." Many studies confirm that the IT infrastructure positively affects the speed of technology-based information (Salahshouri et al., 2022). The focus has been on using technology to facilitate The educational process in higher education institutions; however, the focus is on infrastructure and creating e-learning content.

METHODOLOGY

The project's primary objective is to investigate the correlation between the complete quality management strategy and the e-learning system in the context of climate change, aiming to establish a sustainable educational

system at the University of Kufa. Despite the implementation of numerous approaches, a consensus over the most effective methods for quality management in higher education institutions is still necessary. This is because the quality of education is contingent upon the effectiveness of collaborative efforts. The main research goal is subdivided into a set of subsidiary objectives as outlined below:

- (1) Determine the overarching quality management strategy employed by the University of Kufa.
- (2) Assessing the enhancement of the e-learning system at the University of Kufa.
- (3) Analyze the correlation between the complete quality management strategy and the enhancement of the e-learning system at the University of Kufa.
- (4) Investigating the effects of implementing a comprehensive quality management approach on enhancing the e-learning system at the University of Kufa.

The Scope of the Current Study

The Cognitive Scope

The lack of research on the correlation between the comprehensive quality management plan and the e-learning system in the context of climate change is the reason for this. Hence, the primary objective of this study is to elucidate the intellectual and philosophical essence of the variables under investigation while also focusing on the analytical and interpretive aspects of understanding the nature of their interaction.

The Empirical Scope

Using the whole quality management plan enables educational institutions to ascertain the significance of senior management's dedication (**Figure 1**). Training and education; Participation of all employees; Continuous improvement in improving the e-learning system considering climate change. Iraqi higher education institutions face difficulties that may limit the continuation of the education process with high efficiency and keeping pace with technological developments. Among these difficulties is knowing the impact of the comprehensive quality management strategy in the e-learning system for Sustainable education, so the study was found to be an attempt within the limits of the applied scope of the University of Kufa. It is possible to measure the independent variable (total quality management strategy) through four dimensions (senior management commitment, training, and education; participation of all employees; continuous improvement) brought by Girmanová, Šolc, Blaško, and Petřík (2022). The e-learning system, which serves as the dependent variable, can be assessed using five dimensions: support, satisfaction, e-readiness, performance, and infrastructure (Majid & Lakshmi, 2022).

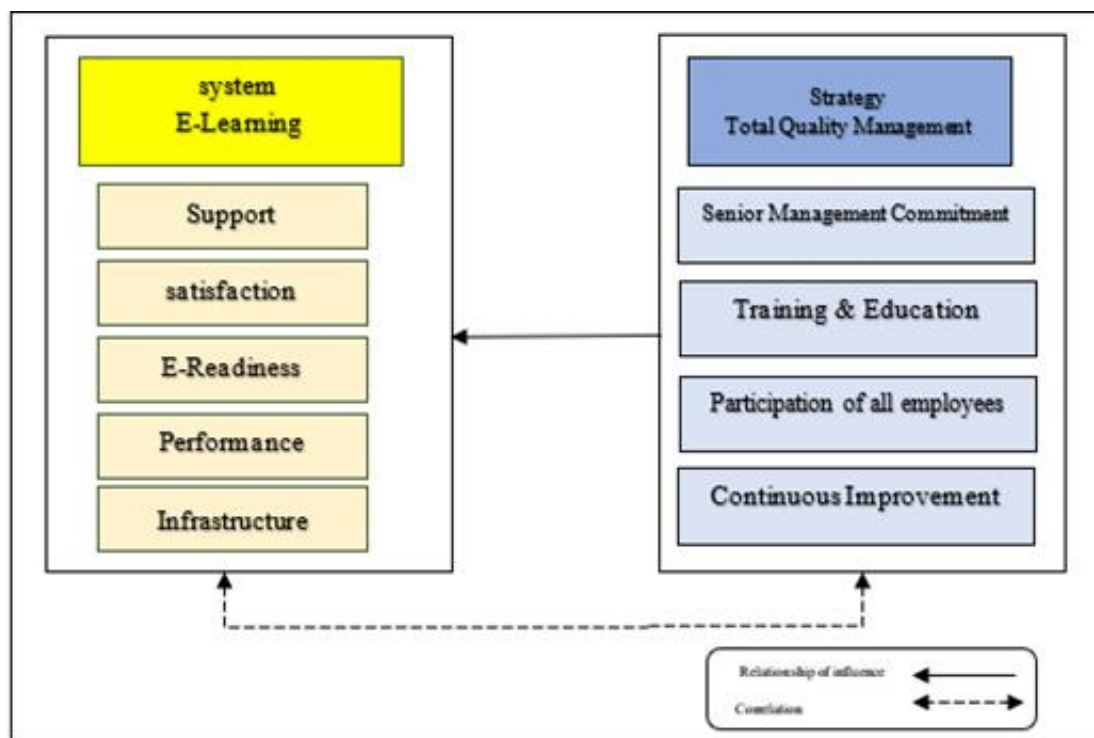


Figure 1. The Research Theoretical Model

RESULTS

Data Collection

Using the electronic questionnaire and the random sample method, the data was collected by sending the electronic questionnaire link via e-mail to thousands of teachers in the community under study (2.262) teaching, and based on it was found that the optimal sample size amounted to (327) teaching, and therefore the questionnaire was distributed, there are (20) questionnaire that has not been received, (12) questionnaire is an incomplete answer. Hence, a questionnaire suitable for statistical analysis, with a response rate of 93%, has been chosen. Statistically valid, as demonstrated in **Table 1**.

Table 1. Descriptive Statistics of the Articles

Status	Number	Percentage %
Number of questionnaires distributed	327	100%
Number of questionnaires retrieved	295	90%
Number of unrecovered questionnaires	20	6%
Number of questionnaires with an incomplete answer	12	4%

Source: Prepared by the researcher.

Testing Hypotheses of the Effect Relationship

This study examined the impact of a comprehensive quality management strategy, consisting of four dimensions (commitment of senior management, training and education, participation of all employees, continuous improvement), on the e-learning system, which consists of five dimensions (support, satisfaction, electronic readiness, performance, infrastructure). The analysis included various indicators, such as Goodness of Fit (GOF). The model is faulty if the goodness-of-fit (GOF) value is less than or equal to 0.1. The model's validity is considered low when it exceeds or equals 0.1 but is less than 0.25. Nevertheless, the model demonstrates moderate validity when its value is greater than or equal to 0.25 and less than 0.36. Assume it is greater than or equal to 0.36. Therefore, this suggests that the model possesses a strong level of validity (Wetzels, Odekerken-Schröder, & Van Oppen, 2009). It is essential to highlight that the coefficient of determination (R^2) for the Squared Multiple Correlations variable can elucidate the entirety of the total quality management plan. Online education platform: The interpretation is crucial if the value of (R^2) is more than or equal to (0.67). However, if the value falls below 0.67 but is greater than or equal to 0.33, it is considered moderate. It is considered weak if the value falls below 0.33 but is greater than or equal to 0.19. It is considered unacceptable if the value falls below 0.19 (Henseler, Ringle, & Sinkovics, 2009). The statistical program Amos v.24 was utilized to determine the effect of reaction to accepting or rejecting the hypotheses.

The test of the central effect hypothesis is depicted in **Figure 2** below. A comprehensive model was constructed to elucidate the intricate connection between the dimensions of the independent variable, the Total Quality Management Strategy (TQMS), comprising twenty distinct elements, and the dimensions of the dependent variable, the electronic learning system (ELS), comprising twenty-four distinct elements. The results demonstrated the assessment of the reliability of conformance indicators through the use of Structural Equations Modeling. The outcome is displayed in **Table 2** provided below.

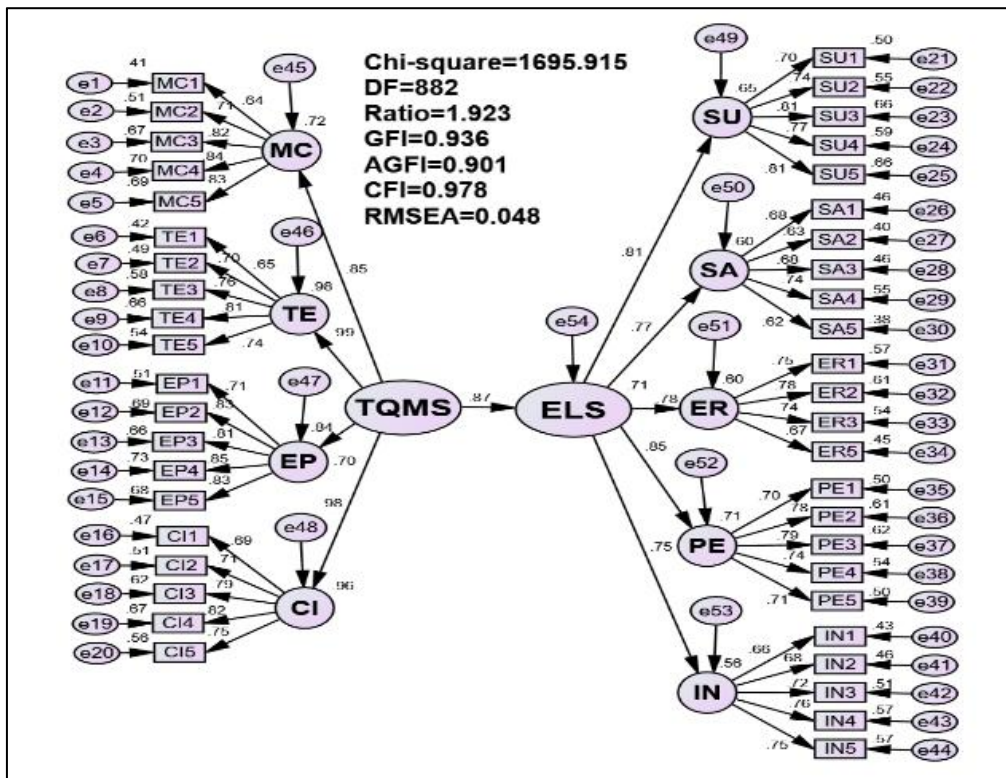


Figure 2. Model for Testing the Central Effect Hypothesis

Furthermore, Figure 2 demonstrates the goodness of fit results for all indicators of the model, evaluating the central effect hypothesis above a value of 0.36, indicating a solid level of validity for the model. The coefficient of determination (R²) is 0.706, more significant than 0.67. This indicates that there is a strong positive correlation between the variables. The Total Quality Management Strategy demonstrated a solid capacity to elucidate the e-learning system. The test results indicated a significant positive impact of the Total Quality Management Strategy on the e-learning system, thus confirming the validity of the central hypothesis as depicted in Table 2. Hereafter.

Table 2. Total Quality Management Strategy Dimensions and E-Learning Systems Influence

Path	Estimate	Standardized Regression Weights	Estimate Squared Multiple Correlations	C.R.	P
ELS <--- TQMS	0.869		0.706	8.715	.0001

Source: Amos v.24 output.

Hypotheses

Testing the First Sub-Hypothesis of Influence

There is a significant effect on the level of senior management commitment in the e-learning system at the overall level.

The test of the first sub-hypothesis of influence is depicted in Figure 3 below. A model was constructed to elucidate the correlation between the dimension of senior management commitment (MC), comprising five elements, and the dimensions of the dependent variable, the electronic learning system (ELS), comprising twenty-four elements. The test results exhibited concurrence with the indicators. The matching quality is determined using the Structural Equations Modeling presented in Table 3 below.

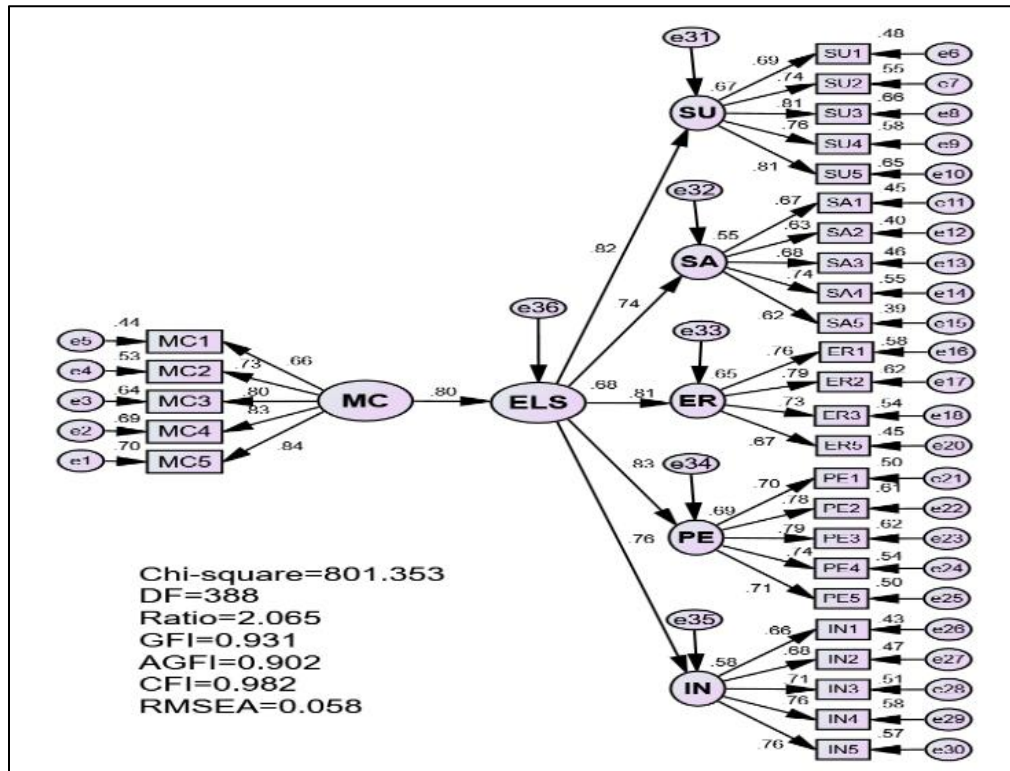


Figure 3. Model for Testing the First Sub-Hypothesis of Influence

Source: Amos v.24 output.

The findings of the model's fit quality for assessing the first sub-influence hypothesis were above 0.36, indicating a high level of validity. Furthermore, the value of R², which is 0.684, is beyond the threshold of 0.67. This indicates that the dimension of senior management's commitment has a significant potential to elucidate. The e-learning system exhibited a strong and resilient nature. The test findings indicated a notable and beneficial impact on senior management's dedication to the e-learning system. The first sub-hypothesis, the focus of the present investigation, is validated and presented in Table 3 below.

Table 3. Effect of Senior Management's Commitment to the E-Learning System

Path	Estimate	Standardized Regression Weights	Estimate Squared Multiple Correlations	C.R.	P
ELS <--- MC	0.803		0.684	9.416	.0001

Source: Amos v.24 output.

It is essential to mention that the results of testing the initial sub-hypothesis of influence were in line with other preceding investigations, such as the Solano (2021) study by Alrehaili, Alothman and Alharbi (2022).

Testing the Second Sub-Hypothesis of Influence

The test conducted in Figure 4 examines the second sub-influence hypothesis. It involves constructing a model that explains the relationship between the training and education (TE) dimension, consisting of five items, and the dimensions of the dependent variable, the effectiveness of e-learning (ELS), consisting of twenty-four items. The test results indicate agreement with the indicators. The table below displays the level of correspondence determined by the Structural Equations Modeling.

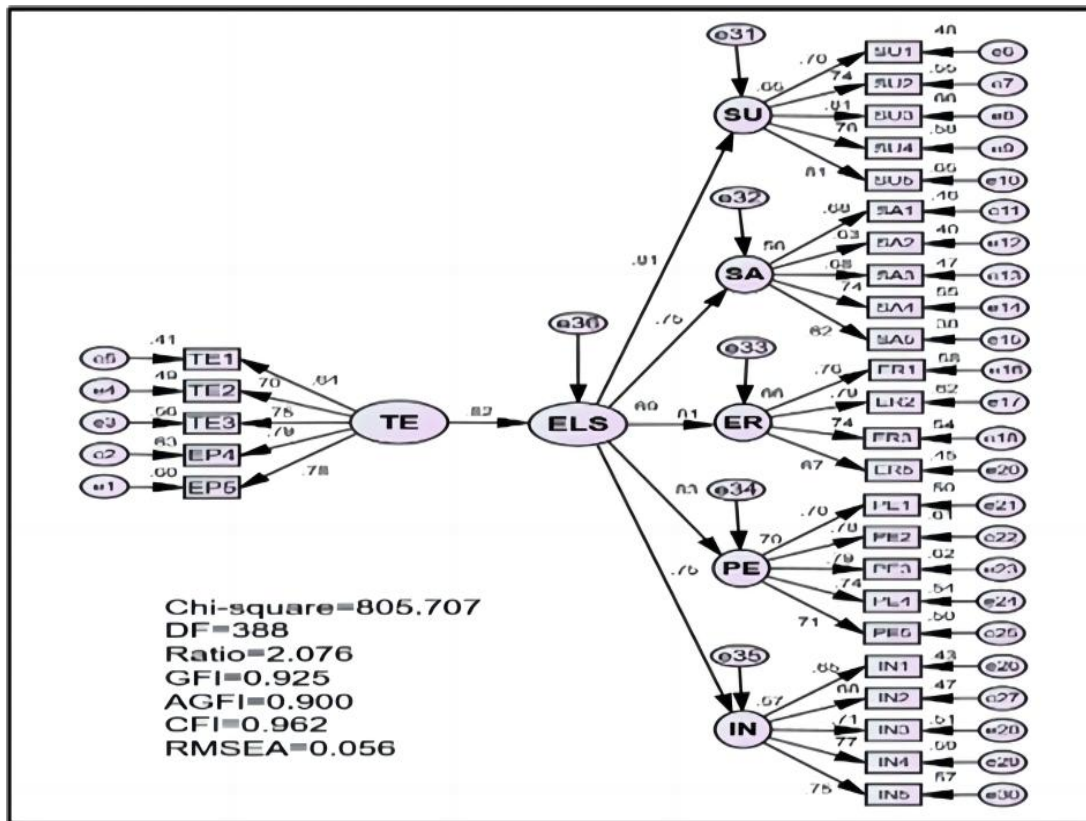


Figure 4. Model for Testing the Second Sub-Impact Hypothesis

Source: Amos v.24 output.

Furthermore, Figure 4 depicted above demonstrates that the goodness of fit values for all indicators of the model evaluating the second sub-influence hypothesis above a threshold of 0.36, indicating a solid level of validity for the model. The value of R2 is 0.692, which exceeds 0.67, indicating that the training and education dimension had a robust explanatory power about the e-learning system. The test results indicated a significant positive impact of the training and education dimension on the e-learning system, thus confirming the validity of the second sub-hypothesis in the current study. This is presented in Table 4 below.

Table 4. Effect of Training and Education on the E-Learning System

Path	Estimate	Standardized Regression Weights	Estimate Squared Multiple Correlations	C.R.	P
ELS <--- TE		0.819	0.692	8.851	.0001

It is essential to mention that the findings from evaluating the second sub-hypothesis of influence aligned with previous studies (Jacksi, Sulaiman, & Saeed, 2021; Solano, 2021; Yang, 2019).

Testing the Third Sub-Hypothesis of Influence

At the general level, the dimension of participation of all employees in the e-learning system has a substantial impact. The test of the third sub-hypothesis of influence is depicted in Figure 5. A comprehensive model was constructed to elucidate the intricate correlation between the dimension of workers' participation (EP), comprising five elements, and the dimensions of the dependent variable, the electronic learning system (ELS), which encompasses twenty-four elements. The test results demonstrated concurrence with the indicators. The degree of correlation is determined by employing Structural Equations Modeling, as illustrated in Table 5 provided below.

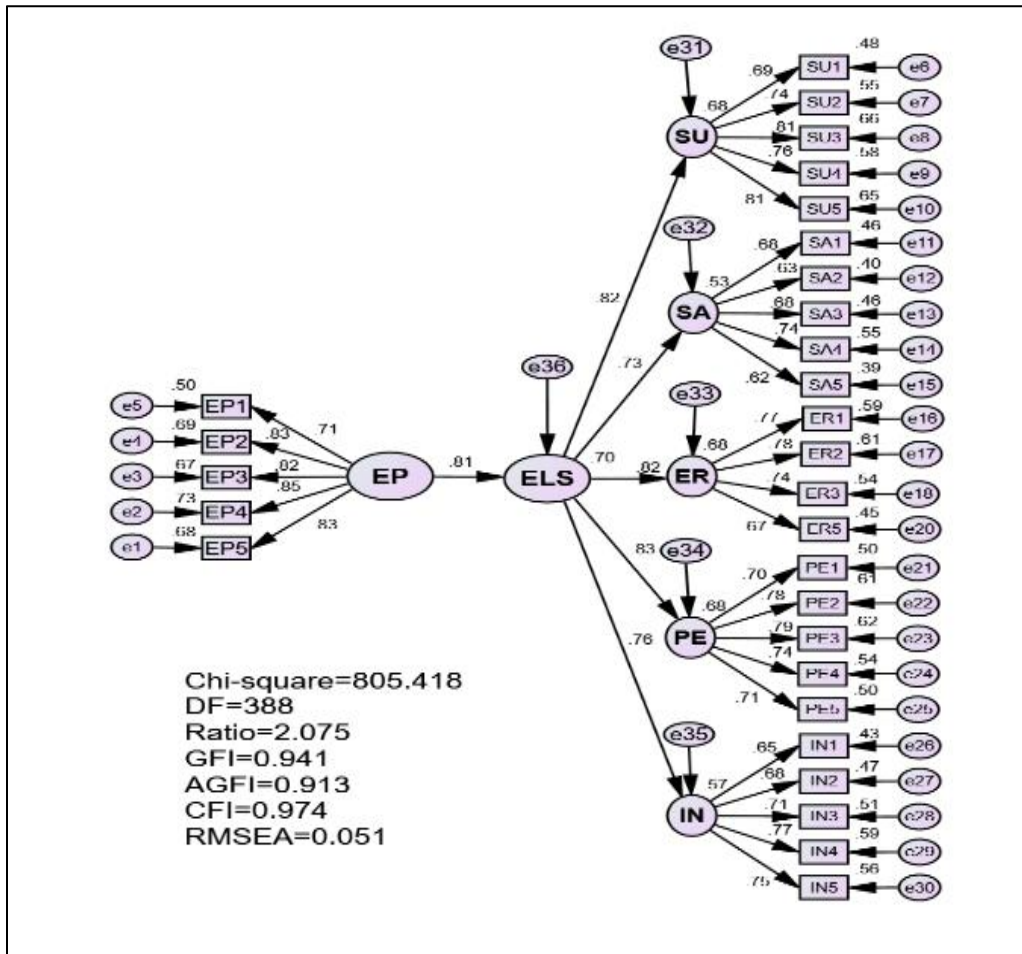


Figure 5. Model for Testing the Third Sub-Influence Hypothesis

Source: Amos v.24 output.

Furthermore, Figure 5 above demonstrates the goodness of fit outcomes for all model indicators in evaluating the third sub-influence hypothesis above a threshold of (0.36), thus showing the model's strong validity. Furthermore, the value of R2 (0.701) is above the value of 0.67, indicating the crucial factor was the employees' capacity to comprehend and interpret the e-learning system across all levels of engagement. The test findings indicated a good moral impact of employee engagement in the e-learning system, confirming the validity of the third sub-hypothesis in the current study. This is evidenced in Table 5 below.

Table 5. Effect of All Employees Participating in the E-Learning System

Path	Estimate	Standardized Regression Weights	Estimate Squared Multiple Correlations	C.R.	P
ELS <--- EP	0.808		0.701	9.042	.0001

Source: Amos v.24 output.

It is essential to mention that the findings from evaluating the third sub-hypothesis of influence aligned with previous studies (Taherdoost & Madanchian, 2022; Yang, 2019).

Testing the Fourth Sub-Hypothesis of Influence

The continuous improvement dimension in the e-learning system significantly affects the overall level.

Figure 6 below shows the test of the fourth sub-hypothesis of influence. A model was constructed to elucidate the nature of the correlation between the continuous improvement (CI) dimension, comprising five items, and the dimensions of the dependent variable, the e-learning system (ELS), comprising twenty-four items. The test results demonstrated concurrence with the indicators. The Structural Equations Modeling determines the

degree of similarity, as illustrated in **Table 6** below.

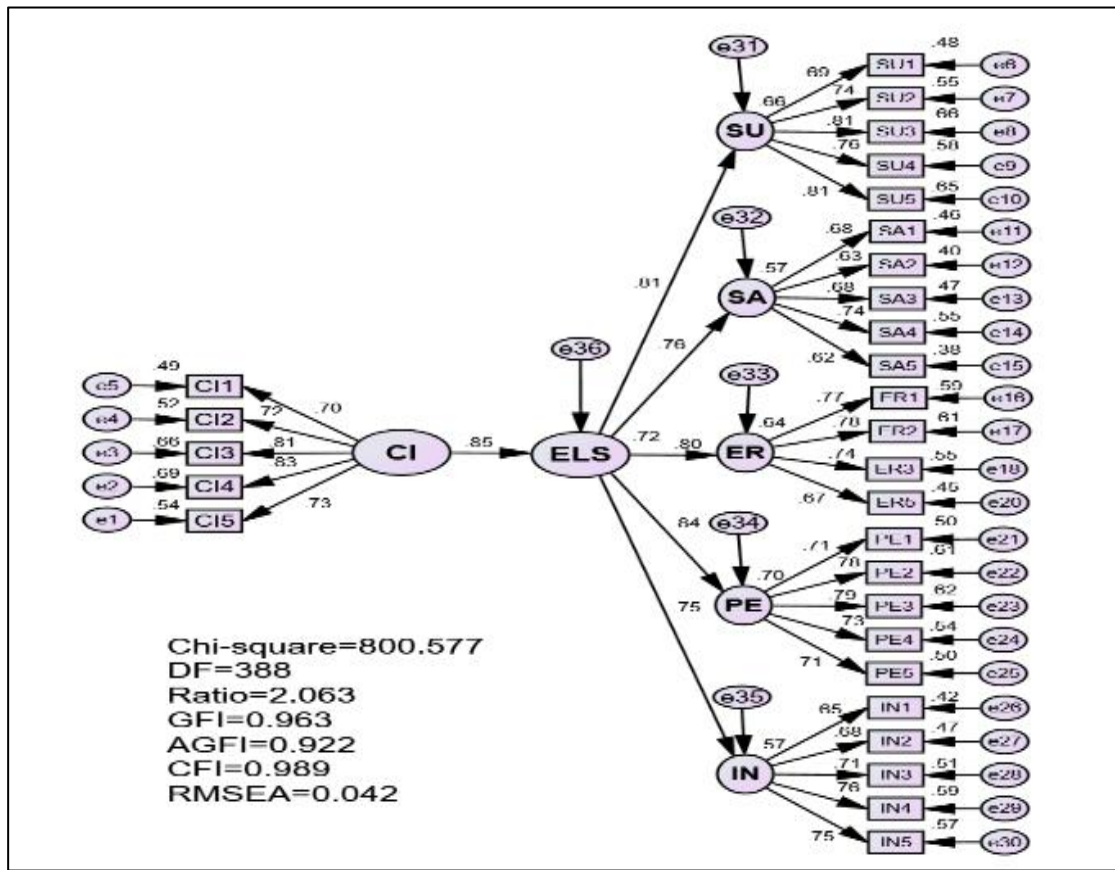


Figure 6. Model for Testing the Fourth Sub-Influence Hypothesis

The goodness of fit in all model indicators for evaluating the fourth sub-influence hypothesis, as depicted in **Figure 6** above, was better than 0.36. This indicates that the model has a high level of validity. The coefficient of determination (R^2) is 0.717, more than 0.67. This indicates that there is a stronger relationship between the variables. The continuous improvement dimension exhibited a robust capacity to elucidate the e-learning system. As indicated by the data, the test results unequivocally demonstrated a substantial positive impact of the continuous improvement dimension on the e-learning system. This affirms the validity of the fourth sub-hypothesis under investigation in the present study, as depicted in **Table 6** below.

Table 6. Effect of Continuous Improvement in the E-Learning System

Path	Estimate	Standardized Regression Weights	Estimate Squared Multiple Correlations	C.R.	P
ELS <--- CI		0.853	0.717	9.080	.0001

Source: Amos v.24 output.

It is essential to mention that the findings from evaluating the fourth sub-hypothesis of influence were in line with previous studies, such as (Alrehaili et al., 2022; Rae, Hunn, & Lobo, 2019; Vivekananthamoorthy & Naganathan, 2015).

DISCUSSION

This research investigates the correlation between the Total Quality Management (TQM) approach and the ELS variable within the framework of climate change. The objective is to establish a durable educational system

and seamlessly incorporate technology advancements at the University of Kufa into the existing educational framework. In order to do this, a survey was conducted to gather the perspectives of different persons employed at the University of Kufa. The findings demonstrate a substantial and favorable influence of the entire quality management methodology on the e-learning system. Our findings indicate that the implementation of entire quality control in the e-learning system is very successful and strongly recommended for adoption. The efficacy of the e-learning system in higher education is contingent upon the implementation of overall quality management. Several suggestions have been made to improve the quality of higher education in Iraq and establish a durable education system in the face of climate change issues. In order to develop thorough strategic plans for quality management, it is essential that all faculty members attain mastery in quality management. This may be accomplished by offering important insights and adopting cutting-edge educational initiatives, while adjusting academic curriculum to proactively address the consequences of climate change. Integrating a thorough quality control system in an e-learning platform is advantageous. In order to successfully incorporate total quality management (TQM) into a higher education e-learning system, it is necessary to make several adjustments to sufficiently handle the many facets of education. The primary factor is that the tangible product lacks educational attributes and instead operates within the realm of the service sector. Moreover, it is essential to consider the pragmatic features of e-learning in higher education. The research findings provide empirical validation and practical evidence supporting the impact hypotheses, demonstrating a substantial influence of the various components of the comprehensive quality management approach on the e-learning system. This discovery emphasizes the need of implementing comprehensive quality management practices inside a company to enhance the e-learning system in response to climate change. Creating a sustainable education system that is in line with technological and scientific advancements is of utmost importance. The research findings suggest that senior management's commitment to the e-learning system has a substantial influence on its overall effectiveness. The outcome suggests that the institution have skilled leadership that is proficient in efficiently executing the e-learning system. The findings indicate a noteworthy influence of the training and education component in the e-learning system at a comprehensive level. Total Quality Management (TQM) is a managerial approach that emphasizes the ongoing improvement of processes and the fulfillment of customer needs and expectations. The initiative requires the active participation of the whole business and aims to enhance procedures in every area, ultimately ensuring the delivery of high-quality goods and services to consumers. Total Quality Management (TQM) may be used across several industries, including the field of education, where it plays a crucial role in sustaining a competitive edge and delivering superior educational experiences to students. Within the realm of education, Total Quality Management (TQM) may be put into practice by following a series of strategic measures. These include clearly identifying the overarching goals of the institution, evaluating the level of contentment among students, scrutinizing and enhancing operational procedures, fostering active participation and commitment from staff members, and building effective systems for managing data and information. The use of TQM concepts in Islamic religious education programs may enhance quality by applying measures such as enhancing the learning curriculum, ensuring sufficient infrastructure and facilities, adopting creative and engaging teaching methodologies, and offering training for instructors and students. Total Quality Management (TQM) is a holistic approach that may be used in many industries to attain ongoing improvement and triumph. Implementing Total Quality Management (TQM) helps enhance the e-learning system. Total Quality Management (TQM) is a methodology that aims to guarantee quality in several dimensions of a system, including user experience, teacher performance, course design, technology, and the learning environment. Through the implementation of Total Quality Management (TQM), enterprises may effectively tackle quality concerns pertaining to these specific domains and achieve the advantages associated with e-learning. The ISO/IEC 25011 standard and the Analytical Hierarchy Process (AHP) may be used to establish priorities for enhancing a learning management system (LMS) and its services. Incorporating a workflow engine and deep learning technologies may further guarantee the production and availability of top-notch material in e-learning systems. By using these techniques and methodologies, schools may enhance the caliber of their e-learning systems and provide a superior learning experience for users. The issue of climate change is a worldwide problem that necessitates a comprehensive educational strategy to foster sustainability and enhance the environmental consciousness of all involved parties. Utilizing an Education for Sustainable Development (ESD) methodology to educate about the consequences of climate change is essential for enhancing comprehension, proficiency, and consciousness of climate change. One may do this by engaging in both official and informal education, with a specific emphasis on fostering advancements in learning, curriculum, and policies. Effective implementation requires the active involvement of stakeholders, including administrators, professors, and students. Educational institutions may mitigate their environmental footprint by adopting energy-efficient building systems, harnessing renewable energy sources, and integrating sustainable practices into the curriculum. Incorporating sustainability and environmental consciousness at all educational levels empowers learners to see problems and engage in responsible actions for a habitable world. Government initiatives aimed at climate education and sustainability

must acknowledge the political aspects of climate change and create a conducive political atmosphere.

CONCLUSION

Implementing whole quality control in the e-learning system is advantageous. To effectively incorporate total quality management (TQM) into the e-learning system of higher education, several adjustments must be made to address the many aspects of education adequately. The main reason is that a physical product does not embody education but functions inside the service industry. Furthermore, addressing the practical aspects of e-learning in higher education is crucial while drawing a conclusion. The study's findings provide evidence of the practical consequences and experimental confirmation of the impact hypotheses, indicating a significant influence of the various parts of the complete quality management strategy on the e-learning system. This discovery highlights the significance of developing comprehensive quality management within the institution to improve the e-learning system in response to climate change. This is crucial for establishing a sustainable educational system that aligns with technological advancements and scientific progress. The study's results, in terms of practical implications, indicate a substantial influence of senior management's dedication to the e-learning system on a broader scale. This suggests that the university possesses competent leadership capable of effectively implementing the e-learning system. The study's empirical findings demonstrate the substantial influence of the training and education component within the e-learning system at a comprehensive level. This suggests that the university offers training courses and workshops to enhance education and implement the e-learning system. The study's empirical findings show a clear ethical impact on employee participation in the e-learning system. This indicates that the institution actively collaborates with its employees to promote improved cognitive capacities, learn new skills, and enhance overall job performance, providing a sustainable educational framework. The study's findings illustrate the tangible consequences of incorporating continual improvement into the e-learning system's moral influence. These findings indicate that colleges are dedicated to improving their services for students and teachers by implementing modern technology and actively monitoring their advancements.

Incorporating total quality management into the whole higher education plan is crucial. The evaluation and follow-up process should be given utmost importance as they form the core of the whole quality management process during the development stages and remain incomplete without considering the influence of e-learning in the context of climate change. Implementing e-learning in higher education encounters numerous problems due to its intricate information systems. Therefore, these systems must exhibit more significant distinction to establish high-quality institutions across diverse disciplines. When formulating a complete quality management strategy, all teaching staff must be prepared to address climate change by giving ideas to leverage and utilize sophisticated programs. Creating a suitable educational environment is crucial for successfully implementing the e-learning system in universities. This entails eliminating any hindrances, whether they be related to personnel, resources, or technology, to establish a long-lasting educational system. This study investigates the correlation between the variable of a comprehensive quality management plan and the variable of an e-learning system, focusing on climate change, to establish a sustainable educational system in Iraq. Consequently, the researcher suggests themes that enhance this area, as demonstrated below:

(1) The role of comprehensive quality management and talent management strategy for continuing the higher education system in light of climate change.

(2) The utilization of artificial intelligence to enhance the e-learning system in response to the challenges posed by climate change.

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