

# Critical success factors for total quality management implementation and implications for sustainable academic libraries

Critical success factor for academic libraries

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## Abstract

**Purpose** – The purpose of this study is to investigate the critical success factors for total quality management implementation and implications for sustainable academic libraries in Ghana. This study is part of a PhD project that focussed on selected technical university libraries in Ghana.

**Design/methodology/approach** – This study adopted a quantitative approach to collect the data. Samples of 124 participants were involved in this study. PLS-SEM (Smart PLS3) software was used to analyse the data. Convergent, discriminant validity assessment was computed. Eight variables of critical success factors were tested in relation to total quality management implementation at selected academic libraries in Ghana.

**Findings** – This study established that out of the eight variables tested, six of them (i.e. top management commitment, employee innovation employee training, organisational culture, teamwork and effective communication, quality performance) indicated a significant positive relationship with total quality management implementation apart from strategic planning and human resource management.

**Research limitations/implications** – This study was limited to eight variables as the critical success factors mentioned in the previous paragraph. The use of one methodology might be a limitation as the use of multimethod might have given a more comprehensive picture than the case. This study was limited to only technical university libraries in Ghana hence caution must be exercised when applying the results to contextually different academic environments. The results are applicable to academic universities library in Ghana and beyond if they are adjusted to suit the context.

**Practical implications** – This study is timely as it may lead to effective total quality management implementation and the sustainability of technical university libraries in Ghana and Africa in general.

**Originality/value** – The proposed model can be used to enhance the smooth implementation of total quality management in academic libraries in general and Ghana in particular. The framework is termed as Eddie and Pat's Achievement of Quality Performance (EPAfQP) model.

**Keywords** Academic libraries, TQM practices, Tertiary institutions, Libraries, Models, Quality performance, Management philosophies

**Paper type** Research paper

## Introduction and background

Library is mostly seen as the heart of educational institution. The purpose of academic libraries is to support teaching, research and to promote services for enhancing research and development ability. Every academic library is mandated to provide correct, prompt and effective service. Many libraries are committed to providing proper and high quality of services to its users at any moment (Khan and Kamal, 2015). The goal of academic libraries is always to maintain a level of service quality and ensure its sustainability in order to satisfy readers. Hence, it is necessary to determine the level of technical and reader services, as well as the measurement of service performance and service quality techniques to better understand readers and provide better services. In the past, consuming more resources, buying more books and moving to large premises were considered as improving quality (Khan and Kamal, 2015).



But that approach may not be too valid today. One of the good solutions to improve quality and sustainability is to provide the right information to the appropriate user at the right time. These require a thorough change in the approach. This could be through the adoption of an approach based on user satisfaction. By formulating a strategic plan and following it with a commitment to continuous quality improvement, library managers can transform and improve their organisations. Tools and techniques of total quality management (TQM) can be applied to develop quality services in academic libraries (Khan and Kamal, 2015). It is believed that this can be achieved by implementing critical success factors of TQM.

Numerous writers have emphasized the value of TQM in service organisation including the academic library (Fatemi *et al.*, 2016; Saleh and Hasan, 2015; Klaassen and Wiersma, 2014; Bon and Mustafa, 2013; Talib *et al.*, 2013; Yapa, 2012; Sivankalai and Yadav, 2012). TQM plays a significant role in harmonizing managerial competence in organisations. TQM is the art of managing the whole scheme to achieve excellence. TQM is a combination of philosophy and a set of guiding principles that represent the foundations of a continuously improving organisation (Fatemi *et al.*, 2016; Talib *et al.*, 2013). TQM is focussed on the understanding that organisations are systems with processes that have the purpose of serving customers. TQM seeks to impose standards, achieve efficiencies and define roles of individuals within the processes and the organisation. It is also to reduce errors and defects by applying statistical process control amongst others (Talib *et al.*, 2013). Studies have shown that TQM, as a management philosophy, has been known to be effective and can play a critical role in helping companies to achieve their goals. In this regard managers are encouraged to utilize the best quality management techniques such as TQM with more confidence to assist in achieving organisational performance (Mehralian *et al.*, 2017).

According to Saleh and Hasan (2015), successful application of TQM can produce many advantages in organisation, including better employee contribution, enhanced communication, augmented output, enhanced quality and reduced amount of rework, less cost of quality, bigger market shares and turn over, and increased personnel and customer satisfaction as well as enhanced competitive advantage. The actual benefit of TQM is to increase organisational performance (Bon and Mustafa, 2013). This has been reiterated by various authors, for example, Klaassen and Wiersma (2014) hold the opinion that TQM is critical for the survival of an institution. TQM is grounded in the principle that errors can be prevented, and shortcomings minimized during working (Sharma, 2013; Sivankalai and Yadav, 2012).

Furthermore, TQM helps customers to become more confident about their service organisation's choice (Fatemi *et al.*, 2016). Following Fatemi Wei and Moayerfard (2016) and Talib *et al.* (2013) further stressed that a lot of research shows that many efforts at quality management systems have failed because of customers' perceptions.

In ensuring that the services of the academic library reach the expected target group, critical success factors of TQM practices such as top management commitment (TMC), employee innovation, employee involvement, employee encouragement, employee training, customer focus, human resource management (HRM), organisational culture (OC), teamwork, as well as strategic planning (SP) (Sharma, 2013; Bon and Mustafa, 2013; Sivankalai and Yadav, 2012) should be considered. The execution of TQM and ensuring its sustainability in an academic library has been considered an indispensable means to review the quality performance of academic libraries (Sivankalai and Yadav, 2012). This is because TQM questions whether or not services are aligned to customers' expectations and needs. Besides, good TQM practices lead to constantly improving the performance of the academic libraries (Sivankalai and Yadav, 2012).

TQM practices are linked to continuously improving capabilities, people, processes, as well as technology in service organisations (Sharma, 2013). This means that when the

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academic libraries are committed to the implementation of TQM practices, service delivery will perhaps be enhanced. This is because the focus of TQM is to maintain standards and bring about continuity, as well as preventing waste in service organisation, including the academic library. Adopting TQM practices in this era of information overload, self-motivated readers and electronic information, budgetary constraints and influx of cyber cafes warrant a holistic paradigm shift in the academic library (Sharma, 2013). This implies that key ingredients of TQM practices should be brought on board to sustain the management of the academic libraries in Ghana.

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### **Contextualization of the study**

Technical universities (TUs) as tertiary institutions in Ghana are relatively young. Prior to 1963, polytechnics in Ghana operated essentially as non-tertiary, second cycle institutions offering advanced craft courses and a few technician level courses. Most recently, some polytechnics in Ghana have been converted into TUs. This development in the polytechnics comes with a new mandate and appeal exacerbating the already teething challenges confronting polytechnic education in Ghana. Amongst these challenges that need to be addressed are TQM implementation and sustainability in academic libraries. As the academic library is the bedrock and an integral part of the process leading to the success of the mandate of the new TUs the issue of TQM is very critical.

A preliminary overview of TQM issues in the TUs that is expected to bring quality performance is the implementation of TQM critical success factors such as top management commitment, customer focus, continuous improvement and innovation, employee involvement and encouragement, process management, quality systems, benchmarking, quality culture, HRM, SP, teamwork and communication amongst others. As technical universities have a different focus and orientation from the traditional universities, there is the need to create a more diverse and better performing higher education system, as outlined in the Report of the Technical Committee on Conversion of the Polytechnics in Ghana to Technical Universities in 2014 (Ministry of Education, 2014). In this regard, there is the need for a holistic assessment of the principles and practices of TQM in the academic libraries of the existing polytechnics in Ghana.

This is because libraries are increasingly supporting academic activities and gaining a reputation throughout the world (Sivankalai and Yadav, 2012). Formerly, there were 10 polytechnics in Ghana, out of which eight were converted to technical universities (TUs) after going through a National Accreditation Board assessment conducted in 2015 (National Accreditation Board, 2016). The assessment criteria were based on the existence of facilities, qualification of staff, faculty/student strength, resourceful libraries, institutional websites and policies of quality assurance practices. The study selected five TUs because they were amongst the first five converted to TU in Ghana. Again, the five TUs were selected for the study because of their proximity to the researcher. The TUs are Kumasi, Technical University, Takoradi Technical University, Accra Technical University, Ho Technical University and Koforidua Technical University. This current research is limited to the evaluation of TQM implementation and implications for sustainable academic libraries in Ghana.

### **Problem statement**

TQM is key to the sustainability of academic libraries as it results in satisfied customers and effective service delivery. Critical success factors (CSFs) may assist academic libraries to implement effective and efficient total quality management systems. However, little is known on the critical success factors that could sustain TQM implementation in academic libraries.

The problem is compounded by lack of management strategy to enhance provision of quality service to meet the information needs of users (Mensah and Adams, 2014).

Preliminary research conducted in eight technical universities libraries (TULs) in Ghana revealed the absence of a management strategy for the implementation of TQM practices. This may adversely affect the quality performance of the academic libraries in Ghana. It is imperative therefore that TQM practices are properly adopted to enhance and improve the performance of the academic libraries. As the current polytechnics are in the process of becoming technical universities, the issue of quality management becomes more important. Presently, the technical universities in Ghana have been accredited to run programmes based on the information resources and functionalities of their libraries.

TQM practices at the current technical university libraries in Ghana therefore need to be investigated to understand how the academic libraries implement TQM in order to deliver quality services worthy of university libraries. The purpose of this study was the investigation of TQM implementation and implications for sustainable academic libraries in Ghana. This study was guided by the following research questions;

- (1) What are the CSFs for TQM implementation in academic libraries in Ghana?
- (2) Which of the CSFs shows a significant positive relationship with TQM implementation in academic libraries in Ghana?

### **Literature review**

The literature review relates the current study to the existing body of scholarship. It outlines the role of TQM in organisations, influence of TMC and teamwork, employee training, employee innovation, OC, effective communication (EC), SP and HRM as CSF for TQM implementation. This study illustrated a conceptual framework that underpins the study.

### **Role of total quality management in organizations**

There have been lots of arguments about the relationship between TQM and quality performance. The debate about the issue of positive and negative relationship has been the pivot of discourse. Mosadeghrad (2014, pp. 148-149) confirmed that "increasing importance and reliance have been placed on TQM practices and initiatives especially in the developed world". This is because educational stakeholders, government agencies, institutions and students are now emphasizing TQM mechanisms. In today's competitive business world, Yapa (2012) and Atinga and Aron (2013) observed that it is very important for academic libraries to adopt TQM principles not only for making profits but also for survival and here the academic library is not an exception. The idea deduced from their contribution is that there is a direct relationship between TQM implementation and productivity.

Malik *et al.* (2010) found that TQM practices such as supplier relationships, benchmarking, TMC and customer focus are critical for TQM and have a positive impact on performance of SMEs. Saleh and Hasan (2015) concluded that TQM as a comprehensive management approach with human resource and process management as key factors has a significant impact and positive role on organisational quality performance in the Iraqi context. This contention has been reinforced and affirmed by contemporary researchers. For example, Talib *et al.* (2013) and Yapa (2012) on TQM and service delivery in academic libraries, have emphatically indicated that the implementation and use of TQM mechanisms can improve all academic library operations. Karani and Bichanga (2012) concluded that TQM implementation has a positive and direct effect on the overall performance of academic library operations. TQM implementation results in performance indicators such as improved

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quality, employee satisfaction, employee participation, teamwork and communication amongst others.

Moghaddam and Moballeghi (2011) cited several instances of the relationship between TQM and productivity. The authors concluded that quality award winners out-performed their counterparts in the working world. For instance, the performance of about 108 firms assessed was better through the implementation of TQM (Moghaddam and Moballeghi, 2011). Ghadiri *et al.* (2013) emphasized that TQM is a quality-oriented approach and influences the quality performance. Alsmadi *et al.* (2014) and Sadikoglu and Hilal (2014) confirmed that there is a positive relation between the operational performance of organisation and the TQM practices. Ngambi and Nkemkiafu (2015) examined the implementation of TQM in Pakistan and explored the relationship between the effective implementation and organisation performance. Ngambi and Nkemkiafu (2015) indicated further that TQM had a bearing on the performance of an organisational performances.

In another study, Alghamdi (2018), examined the relationship between TQM and organisational performance, considering the moderating effect of organisational culture. The study revealed that the relationship between TQM and organisational performance is a positive and statistically significant. The relationship between TQM and organisational performance has been extensively examined, yet mixed results have been reported (Alghamdi, 2018). Most of the previous studies concluded a positive relationship between TQM and organisational performance. TQM is recognized as a strategy that considers customers as the main concern and provides them with a high quality services and products through adding continuous improvements in the production processes (Al-Qahtani *et al.*, 2015; Ngambi and Nkemkiafu, 2015). Alamri *et al.* (2014) argued that organisational performance measurement has become more crucial for the survival of companies in today's globalization market. Performance measurement allows organisations to pay more attention to the significant areas they are lacking (Alamri *et al.*, 2014).

### **Influence of top management commitment as critical success factors (CSF) for TQM implementation**

The introduction of TQM needs TMC effort (Malik *et al.*, 2010). TMC is the most critical factor in successful implementation of TQM (Malik *et al.*, 2010). Often, efforts to implement TQM often fail because top management does not lead and get dedicated. Top management outlines quality goals, policies and plans according to the principles of TQM implementation (Burn, 2011). Bhatt (2012) also shares the same idea, by saying that the provision of vision, commitment and leadership is a mark that should be exhibited by management in the process of TQM implementation. Karani and Bichanga (2012) concluded that it is for top management to concentrate fully on the implementation of TQM processes by controlling the external and internal variables, by providing guidance and spelling out all the responsibilities of all parties concerned.

TMC also enhances the use of performance indicators linked, directly or indirectly, to customer requirements and satisfaction, as well as employee remuneration (Negi and Srivastava, 2015). Fatemi *et al.* (2016), argued that in many cases TQM practice, especially in-service organisation, fails because there is no strong support from top management.

Reddy (2012), alluded that top leadership and management must be involved in the quality process and the designing of policies and audits, not forgetting the inclusion of the library staff members. Besides in showing full TMC in achieving the organisation's goals, mission and visions by management, it is crucial to allow a high level of employee involvement and with a considerable competency in the process of TQM activities (Reddy, 2012). From the forgoing discussion there is a relationship between top management and TQM implementation.

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### **Influence of employee innovation as critical success factors (CSF) for TQM implementation**

Employee innovation is a critical in TQM implementation (Brito and Vergueiro (2013); Sathe (2015); Fatemi *et al.* (2016); Karani and Bichanga 2012; Brito and Vergueiro (2013); Sathe (2015); Fatemi *et al.* (2016) and Negi and Srivastava 2015). In the process of continuous improvement and change, there is the need to allow all employees, irrespective of their level to be fully part of achieving the targeted goals, visions and missions of the organisation. This is because personnel are an important resource and asset and quality comes from them (Karani and Bichanga, 2012; Brito and Vergueiro, 2013; Sathe, 2015).

Furthermore, employees' involvement in all work processes brings about a considerable level of competency and allows the change targeted to take place in the said situation just like the TQM process (Ho, 2011). Ater (2013, pp. 73-74) also stated that to "mitigate the challenges associated with the implementation of TQM principles, there is the need to bring all on board by outlining the responsibilities and duties of the employees and giving the directions of possible ways of doing them".

Moghaddam and Moballegghi (2011), successful TQM implementation should have committed and well-trained staff members that will participate fully in all the quality improvement activities. Bhatt (2012), on the other hand, was of the view that staff involvement brings team work and encourages all to take part in the daily activities of the library. Bhatt (2012), confirmed that encouraging employees to get involved in quality decision and management decision-making enables them to feel responsible for their duties and helps the organisation to make better decisions for their performance and quality improvement.

### **Influence of training as CSF for TQM implementation**

Training and innovative programmes towards TQM implementation are very critical in all organisation including the academic library. The employees of the organisation should be given the necessary training and development activities to make them conversant with their roles in the achieving of the goals, vision and mission of the organisation. According to Sivankala and Yadav (2012), constant development of the work schedule must deal not only with improving results but it also must more importantly also deal with improving capabilities that will produce better results in the future. Sivankala and Yadav (2012), stressed the five major areas of focus for quality improvement, namely, technology, operations, people capability, demand generation as well as supply generation. Therefore, training and development activities are considerably important in TQM programmes.

Yapa (2012) also argued that the success of TQM activities cannot be possible unless they are tied to a regular organisation of training and development programmes. TQM practices rekindle the spirit of the employees towards performing as expected and meeting standards. Sharon and Okibo (2012) were also of the opinion that training and development programmes with regards to TQM implementations must not be for a short period but should be systematic to assist the employees to achieve the set target. Similarly, Talib *et al.* (2004) posited that quality improvement cannot be successful without a holistic training and development programme and should be done once the needs assessments are conducted for the employees. Bhatt (2012) also concluded that TQM implementation involves setting a goal for continuous training and development of all categories of staff members.

Rajesh (2012) reiterated that there is evidence that lack of understanding and proper training and development exists at all levels of any organisation, and that it is a large contributor to worker resistance. For TQM to be successful, organisation must commit to training employees at all levels. TQM implementation should provide comprehensive training, including technical expertise, communication skills, small-team management,

problem-solving tools and customer relations (Rajesh, 2012). Without constant training and development activities in place the organisation could easily fail in achieving its goals (Altayeb and Alhasanat, 2014).

Inadequate education and training are also a major obstacle to the development and implementation of TQM initiatives. Training and education are key components in the TQM programme. Education and training can result in a more satisfied workforce and an environment for innovation and creativity. Education and training provide the necessary knowledge, skills and abilities for employees to do their job effectively, and diagnose and correct their daily problems at work (Mohsadeghard, 2013).

Continuous improvement, according to several authors, for example Bon and Mustafa (2013); Talib *et al.* (2013); Chauhan (2014); Malik *et al.* (2010) and Sadikoglu is considered one of the critical success of TQM implementation in service organisations. Bon and Mustafa (2013), in a previous study, ascertain that continuous improvement and innovation helped satisfy the customers and increase the competitive advantage of the organisation. Talib *et al.* (2012) posited that continuous improvement and innovation is the most important part of services, implying that it is the looking for never-ending improvements and developing processes to find new or improved methods in the process of converting inputs into useful outputs. Malik *et al.* (2010) equally confirmed that continuous improvement is a critical success factor for TQM implementation.

### **Effect of human resource management as CSF for TQM implementation**

According to Saleh and Hasan (2015), HRM can be measured using sub variables such as process of staff selection, internal customer concept, employee satisfaction and acceptance of responsibilities for quality, amongst others. Saleh and Hasan (2015) claimed that HRM problems such as lack of enough experience and information, lack and weakness of employees' empowerment and motivation, changing employees' work habits, team orientation and inadequate time are HRM barriers that affect the successful implementation of TQM in service organisation (Mohsadeghard, 2013). HRM is another factor of TQM in service organisation that associates strongly with customer satisfaction within an organisation by managing employees to work together in group's organisation to improve organisation performance (Sit *et al.*, 2009). It is also argued that HRM plays a big role in supporting the programme of TQM in the organisation (Salhieh and Abu-Doleh, 2015).

Salhieh and Abu-Doleh (2015), further argued that in the real-world experts and researchers have confirmed that HRM has a considerable influence on TQM implementation if there is harmony and synergy amongst its practices. Talib *et al.* (2013) concluded that HRM is important for improving business performance and management processes. In this regard, it is one of the CSFs in any successful TQM implementation and it correlated with quality performance positively. Khanna *et al.* (2011) posited that in TQM implementation there is a significant affirmation of employees' involvement and management within the organisation by enabling them to participate meaningfully to achieve continuous improvement of the processes and their quality.

Malik *et al.* (2010) explored the impact of TQM and market completion on organisational performance and established that there was a positive correlation between market completion and TQM practices of HRM.

### **Influence of organisational culture as CSF for TQM implementation**

Quality culture is also seen as one of the critical success factors for the introduction of TQM. According to Moghaddam and Moballegghi (2011), it is not easy to introduce TQM. There is the need to create an open and cooperative culture by the management. This is because the

employees must feel that they are responsible for customer satisfaction. The writers argued that the employees are going to feel isolated when they are excluded from the development of the vision, strategies and plans of the organisation. In the process of ignoring them, the employees may behave in a different way to impede the process of TQM. [Talib \*et al.\* \(2013\)](#) also argued that quality culture is a bedrock of introducing a change in an organisation.

Successful TQM implementation requires a thorough understanding of critical success factors; barriers to achieving these factors are managerial tools and tools techniques. Amongst the factors quality culture is rated as crucial ([Moghaddam and Moballegghi, 2011](#)). [Sinha \*et al.\* \(2016\)](#) established that there is a linkage between cultural dimensions and TQM interventions.

It was also confirmed that quality culture has a significant and positive impact on TQM implementation. Organisations should create and develop a supportive OC prior to adopting any strategy ([Al-Dhaafri and Al-Swidi, 2016](#)). Libraries can also excel in their performance by maintaining the quality standards and conformities as prescribed in TQM principles of which quality culture is key ([Negi and Srivastava, 2015](#)). Again, [Baird \*et al.\* \(2011\)](#) concluded that most organisations need to be ready by providing guidance as to the culture that is conducive to TQM, thereby contributing to the desired operational outcome.

### **Effect of teamwork and effective communication as CSF for TQM implementation**

Teamwork refers to an increase in employees' control over their work and allows them to work as a group ([Talib \*et al.\*, 2012](#)). It provides an atmosphere of mutual relationship, involvement and participation throughout the organisation ([Talib \*et al.\*, 2012](#)). Teamwork as a TQM practice is positively associated with employee job satisfaction. The formation of teams within an organisation is critical to an organisation's TQM success. Teamwork is also mentioned by [Sathe \(2015\)](#) as one of the 13 steps described by Oakland on the discourse of TQM in libraries in India. Managers and practitioners use EC to enlist the support of other employees towards achieving organisation's objectives ([Sathe, 2015](#)). EC influences the organisation to move systematically towards employees' involvement and customer satisfaction and improves organisation performance ([Talib \*et al.\*, 2012](#)). EC was identified by [Mosadeghrad \(2013\)](#) as one of the variables that can impede effective implementation of TQM.

### **Influence of strategic planning as CSF for TQM implementation**

SP incorporates the development and deployment of plans, improve relationships with customers, suppliers and business partners and helps in achieving long- and short-term goals through participative planning ([Ooi \*et al.\*, 2012](#); [Hung \*et al.\*, 2011](#)). Indeed, a significant link is found between SP and quality performance ([Prajogo and Cooper, 2017](#)), role conflict and knowledge management behaviour ([Ooi \*et al.\*, 2012](#)) and customer satisfaction ([Sit \*et al.\*, 2009](#)).

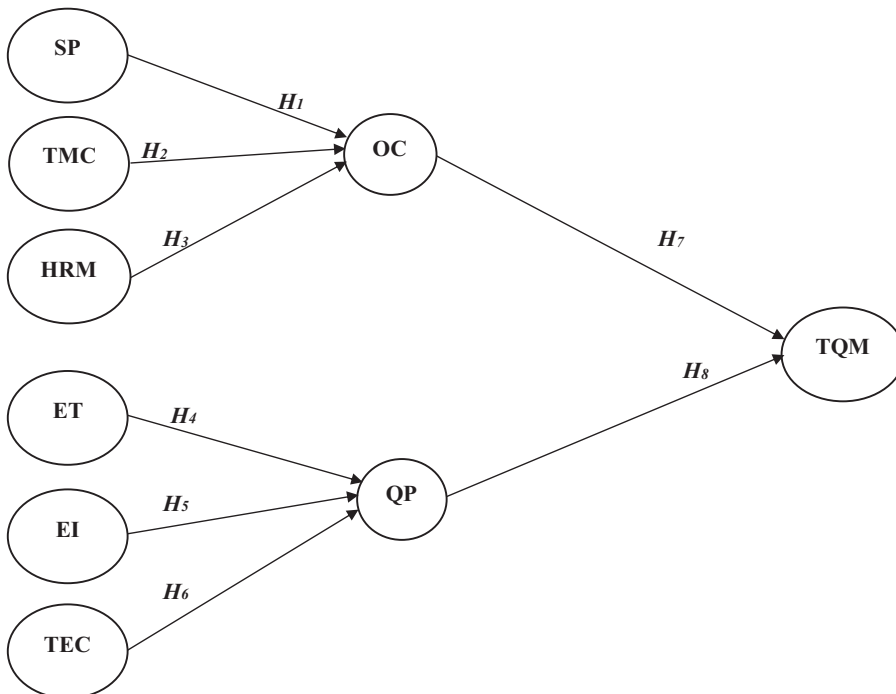
[Negi and Srivastava \(2015\)](#) concluded that it is well known that TQM is a management method which libraries can benefit from in several ways and that by formulating a strategic plan and following it with a commitment to continuous quality improvement, library managers can transform and improve their organisations. [Mohsadeghard \(2013\)](#) argues that a successful implementation of TQM requires a long-term strategic plan because lack of a detailed planning prior to the introduction of TQM in organisations is a key reason for its future failure. Again, it was echoed by the author that strategic quality planning is necessary for integrating quality objectives, requirements and targets into organisational operations and activities.



**Research model**

Based on the literature review on the critical success factors for TQM implementation and implications for sustainable academic libraries Figure 1 presents the conceptual model of the current study. Ngulube (2020) suggested that conceptual models may be informed by various concepts in the literature. The model depicts the relationship between the critical success factors and TQM implementation. Each path along with the model representing the research hypotheses is further stated.

- H1. There is a significant positive relationship between strategic planning and organisational culture.
- H2. here is a significant positive relationship between top management commitment and organisational culture.
- H3. There is a significant positive relationship between human resource management and organisational culture.
- H4. There is a significant positive relationship between employee innovation and quality performance.
- H5. There is a significant positive relationship between employee training and quality performance.
- H6. There is a significant positive relationship between teamwork and effective communication and quality performance.



**Figure 1.**  
Research conceptual framework

- H7. There is a significant positive relationship organisational culture and total quality management.
- H8. There is a significant positive relationship quality performance and total quality management.

### Methodology

This study sought to consider TQM implementation and its implications for sustainable academic libraries in Ghana. The objectives of this study was to establish the critical success factors that influence TQM implementation and implications for sustainable in academic libraries. This study adopted a quantitative approach with a survey design because the researchers wanted to be detached from the subjects been researched. Members of the population were the head librarians/directors and library staff members in the selected TULs. The use of survey research made it possible to conduct a cross-sectional study thus data collected at one point in time with a view to describe the relationships. The head/director librarians and their staff members were considered because of their experience and daily involvement with the library.

The population was 124 library staff members from the selected technical universities in Ghana. This comprises professionals and para-professionals working in the selected TULs. A questionnaire was the main instrument used to collect data in this study. This was designed in three parts. The first part solicited data on the demographic characteristics of the respondents. The second part dealt with determine the critical success factors appropriate for TQM implementation in academic library. The last part measures the level of influence of the critical success factors and implications for sustainable in academic libraries. The 5-point Likert scale which is useful for measuring variables formed the basis of the questionnaire design.

Saunders *et al.* (2016) suggested conducting any research ought to shield the participants of the study from any risk and abuse, like emotional, psychological or physical abuse, amongst others. As a result, principles of confidentiality of information given by the respondents were strictly adhered to, in that no information provided during the period of data collection would be divulged, and no participant was forced to provide information and data against his or her wishes. Besides, all sources cited and referenced for the study were duly acknowledged.

### Findings and discussion

This study was the evaluation of the CSFs for TQM implementation and implications for sustainable academic libraries in Ghana. The study sought to find answers on the CSFs for TQM implementation and extent the critical success factors influence TQM implementation in academic libraries in Ghana. The study collected data from selected TULs' staff members in Ghana. A considerable high response rate of 72.5% was reached out of the total questionnaire distributed. This was in line with the assertion of Gideon (2012) that a 70% or higher response rate is considered appropriate. Informed consent to participate in the survey questionnaire was provided by all the professionals and para-professionals of the selected TULs. The major findings of this study support the process of TQM implementation and implications for sustainable in academic libraries. The results of the study are presented as per the research questions denoted as RQ1 and RQ2 respectively.

RQ1. What are the CSFs for TQM implementation in academic libraries?

The intention of the RQ1 was to identify the CSFs of TQM implementation in academic libraries. Table 1 reported on the CSFs for TQM implementation in academic libraries as

stated by the respondents. The research question was to determine the critical success factors for TQM implementation in academic libraries. The critical success factors stated are as follows: HRM, teamwork and EC, OC, TMC, employ training, SP, employee innovation as well as quality performance as the independent variables and TQM as dependent variable. This research question seeks to find out which of the CSFs mostly influence TQM implementation in academic libraries. The indicators listed by the respondents were measured to establish the extent of influence by the CSFs for TQM implementation.

In testing the research model, a partial least squares structural equation modelling technique (PLS-SEM) analysis was done to examine the theoretical relationship between latent constructs, and measurement paths between latent constructs and its indicators. The convergent validity assessment was acceptable because the values loaded were higher than the values of 0.6. Again, the average variance extracted (AVE) was also within the threshold of 0.5. The composite reliability of the items was also above the cut off value of 0.7 (Hair *et al.*, 2010). The discriminant validity assessment was also acceptable. The correlation values are less than the square root of AVE which confirms the acceptability of the discriminant validity assessment. Tables 1–3 illustrates the measurement model described.

*RQ2.* Which of the critical success factors shows a significant positive relationship with TQM implementation in academic libraries?

The model explained 69% in the variation in TQM and 46.1% and 75.0% variance of OC and QP, respectively. Out of the eight hypothesized relationships tested in the study, six are supported. As hypothesized in H1, Strategic Planning shows a significant positive relationship with OC with path coefficient of ( $\beta = 0.197^{***}$ ), but do not support H1. H2 states TMC positively affects OC with the path coefficient, ( $\beta = 0.346^{***}$ ), and supports H2. Again, Human Resource Management positively influence OC with path coefficient ( $\beta = 0.201^{***}$ ), but it is insignificant to support H3. H4 demonstrated a positive effect of Employee Training Quality Performance and supported H4 with a confirmed path coefficient ( $\beta = 0.214^{***}$ ). Employee Innovation shows a significant positive relationship with Quality Performance with a confirmed path coefficient ( $\beta = 0.397^{***}$ ), hence supporting H5.

Teamwork and EC demonstrated a significant positive relationship with Quality Performance with path coefficient ( $\beta = 0.340^{***}$ ) and supports H6. In the same instance, OC shows a significant positive relationship on Total Quality Management with path coefficient ( $\beta = 0.03555^{***}$ ) thus confirming hypothesis H7. And Quality Performance influence Total Quality Management with path coefficient ( $\beta = 0.0512^{***}$ ) supporting H8. Figure 2 of Path Estimation Results illustrated the results in a structural model analysis.

Model variables	Cronbach's alpha	rho_A	Composite reliability	Average variance extracted (AVE)
Employee Innovation (EI)	0.812	0.812	0.889	0.727
Employee Training (ET)	0.709	0.767	0.834	0.631
Human Resource Management (HRM)	0.709	0.722	0.836	0.629
Organisational Culture (OC)	0.783	0.803	0.875	0.701
Quality Performance (QP)	0.809	0.816	0.886	0.722
Strategic Planning (SP)	0.866	0.869	0.918	0.788
Teamwork and Effective Communication (TEC)	0.848	0.852	0.908	0.767
Top Management Commitment (TMQ)	0.845	0.850	0.906	0.763
Total Quality Management (TQM)	0.821	0.843	0.893	0.736

**Table 1.** Results of convergent validity assessment

**Table 2.**  
Results of discriminant  
validity assessment

Model variables	Employee innovation (EI)	Employee training (ET)	Human resource management (HRM)	Organisational culture (OC)	Quality performance (QP)	Strategic planning (SP)	Teamwork and effective communication (TEC)	Top management commitment (TMQ)	Total quality management (TQM)
Employee Innovation (EI)	0.853								
Employee Training (ET)	0.711	0.794							
Human Resource Management (HRM)	0.512	0.629	0.793						
Organisational Culture (OC)	0.807	0.710	0.580	0.837					
Performance (QP)	0.816	0.725	0.508	0.832	0.850				
Strategic Planning (SP)	0.645	0.664	0.678	0.612	0.669	0.888			
Teamwork and Effective Communication (TEC)	0.784	0.670	0.527	0.815	0.795	0.614	0.876		
Top Management Commitment (TMQ)	0.688	0.780	0.708	0.647	0.691	0.804	0.666	0.873	
Total Quality Management (TQM)	0.733	0.703	0.592	0.781	0.807	0.731	0.724 0.85	0.767	0.858

	Path coefficient	Sample mean (M)	SD (STDEV)	T statistics ( O/STDEV )	P-value
Employee Innovation (EI) → Quality Performance (QP)	0.397	0.387	0.098	4.035	0.000
Employee Training (ET) → Quality Performance (QP)	0.214	0.223	0.066	3.233	0.001
Human Resource Management (HRM) → Organisational Culture (OC)	0.201	0.203	0.138	1.451	0.148
Organisational Culture (OC) → Total Quality Management (TQM)	0.355	0.355	0.122	2.905	0.004
Quality Performance (QP) → Total Quality Management (TQM)	0.512	0.515	0.114	4.513	0.000
Strategic Planning (SP) → Organisational Culture (OC)	0.197	0.206	0.140	1.412	0.159
Teamwork and Effective Communication (TEC) → Quality Performance (QP)	0.340	0.345	0.089	3.822	0.000
Top Management Commitment (TMC) → Organisational Culture (OC)	0.346	0.346	0.165	2.093	0.037

**Table 3.** Results of structural model analysis and hypothesis

### Conclusion

This study investigated the CSFs for TQM implementation and implications for sustainability in academic libraries in selected TULs in Ghana. This study established that six out of eight of the CSFs investigated have influence on implementation TQM and its sustainability is highly encouraged in academic libraries. With reference to their level of influence it was established that SP, TEC, HRM, OC, ET, TMC, EI and QP influence TQM implementation. However, in establishing relationship with TQM implementation all the hypothesis were supported as having significant and positive relationship, except the variables HRM and SP that indicated no relationship between TQM implementation in the academic libraries. Based on the findings and the results, in order to ensure an ideal sustainable academic library in the context of Ghana and Africa, it is prudent to propose a conceptual model to be used in the academic libraries. This study therefore proposed a conceptual model known as Eddie and Pat's Achievement of Quality Performance Model (EPAfQP). The proposed conceptual model is illustrated in Figure 3.

Taking the academic library as a system, the model could be adopted and sustain in the implementation of TQM. In attempt to achieve results, there is the need for TMC in supporting funding, resources and facilities. Again, in the same way the employees (EI) must be involved in decision-making on quality management and as well as employee exposed to training (ET) on related skills training for the staff members. Similarly, the innovativeness (EI) of the staff members should also be recognized through permitting and welcoming new ideals from them. In making sure that the staff conforms to work ethics in the working environment there is the need for an OC that will regulate the working lives of the staff. Moreso, there is the need for teamwork amongst the staff members for easy coordination of activities. Flow of EC from management should be encourage to establish clear lines of authority and also to achieve the end results, SP that indicates the intended implementations in the academic library is laudable.

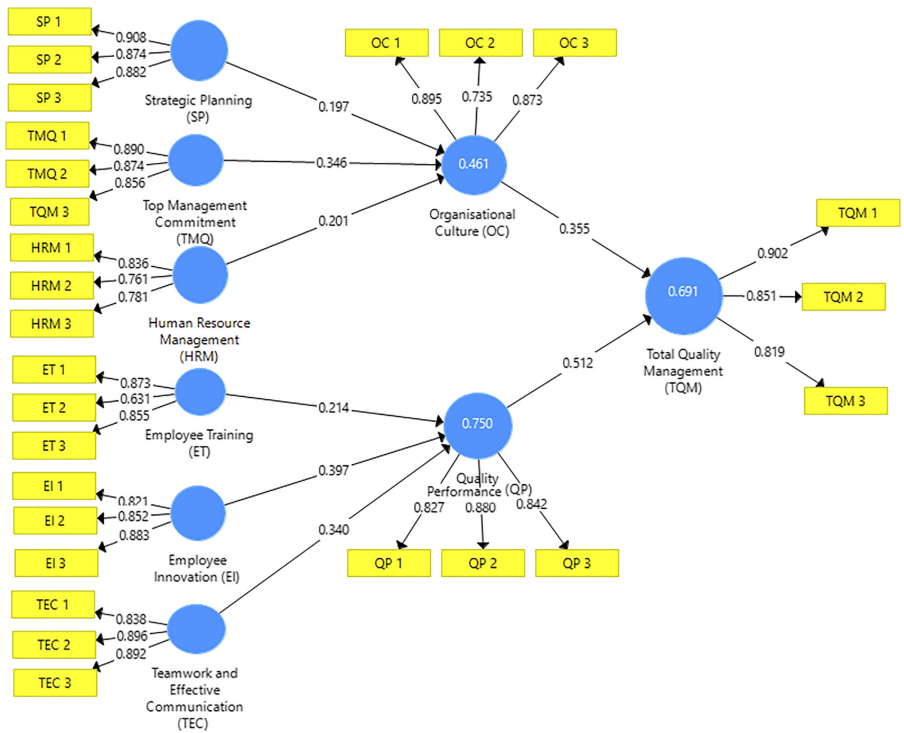


Figure 2. Path estimation results

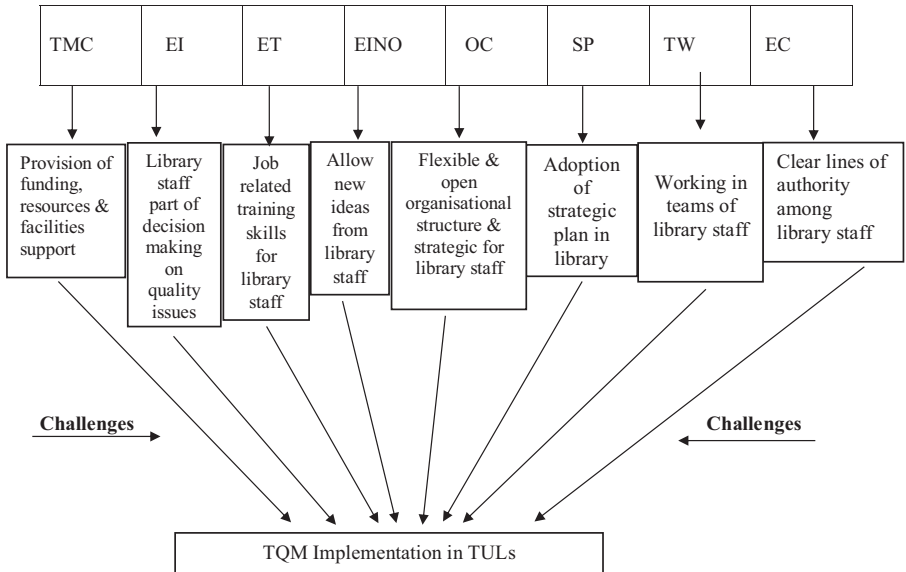


Figure 3. TQM implementation (critical success factors (CSFs))

### Research implications and limitations

The importance of assessing the TQM practices in academic libraries cannot be over-estimated. It is likely that the conclusion of this study will aid and appraise TQM practices among librarians or information workers of TUs' libraries in Ghana. It will also underscore the need for TQM principles and procedures, so that the best practices are used in academic libraries in a developing country such as Ghana. The study is justified because TQM is a philosophy which many organisations are embracing, hence the academic library is not an exception. The study will also account for the quality performance of the academic library to survive the changing trend in the service industry. This will be the holistic integration of the TQM practices (i.e. TMC, employee involvement, employee training, employee innovation, customer focus, employee involvement, human resource management, OC, SP, EC and teamwork in the library system. The outcome could be used to predict a model for quality performance in the library system.

In addition, the significance of this study is in respect of helping the educational sector, especially the tertiary level, to develop and map out a working document, and equally for future reference in line with TQM practices in academic libraries, as contained in the Report of the Technical Committee on Conversion of the Polytechnics in Ghana to Technical Universities of 2014 (Ministry of Education, 2014). Furthermore, the results of the research are expected to assist all the stakeholders such as management, faculty members, heads/directors as well as faculty administrators in charge of libraries to develop a working document meeting the standard requirement of accreditation.

The findings are also expected to augment the existing literature in information science and librarianship in Africa. The situation is not different in Africa, some writers (Mensah and Adams (2014), Boateng-Okrah and Fening (2012) and Karani and Bichanga (2012) have also demonstrated through their studies that TQM is not foreign in the context of enhancing organisational performance but its implementation and sustainability is the problem. Exploring more in Africa, Akpan *et al.* (2014) on the issue of TQM and sustainable development in organisations recommended the integration of Deming's Plan Do Check Act and Define, Measure, Analyze, Improve, Control Six-Sigma in the strategic plans for purposes of achieving sustainable development.

This study is timely as it may lead to effective TQM implementation and the sustainability of TULs in Ghana and Africa in general. This study was limited to eight variables as the critical success factors mentioned in the previous paragraph. The use of one methodology might be a limitation as the use of multimethod might have given a more comprehensive picture than the singular methodology. This study was limited to only TULs in Ghana hence caution must be exercised when applying the results to contextually different academic environments. The results are applicable to academic university libraries in Ghana and beyond when they are adjusted to suit the context.

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