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Application of Total Quality Management Theory on Health and Safety of Staff and Students in Aftermath of the Covid-19 School Closures in UasinGishu County, Kenya

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Abstract:

As the world is grappling with COVID-19 Pandemic, education sector has been greatly affected. Schools have been closed. Therefore, strategies on how to recuperate from the damage caused by school closure should be developed to help in the schools re-opening process. The study therefore sought to scrutinize the outcome of application of TQM theory on supervision of COVID-19 pandemic matters in UasinGishu County, Kenya. Mixed research method, ex-post facto research design was engaged. The study targeted 184 principals from which 18 principals were sampled methodically to play a part in the enquiry. Survey form and surveillance checklist were engaged as data assortment instruments. The enquiry established that schools that will utilize Deming 14 principles of TQM will successfully uphold health and safety of students and staff in aftermath of COVID-19 school closure. The enquiry also established that there was a positive and noteworthy affiliation between communiqué ($\chi^2=7.325$, $df=4$; $p=.001$), top administration dedication ($\chi^2=10.087$, $df=4$; $p=0.039$) and training and improvement ($\chi^2=8.196$, $df=2$ $p=0.017$) on maintenance of health and safety of staff and students. The enquiry applauded that supplementary prominence should be place in ensuring valuable application of TQM principles in schools to assist in the supervision of the COVID-19 pandemic when schools revive. The enquiry also commended that there ought to be training of both instruction and non- instruction staff on administration of COVID-19 even prior to the schools re-opens to guarantee their safety and that of the students.

Keywords: Total quality management, COVID-19 pandemic, management of health and safety

1. Introduction

Total Quality Management (TQM) is an approach of refining the efficacy and tractability of schools as a whole. It is an indispensable approach of establishing and encompassing the whole school, every department every activity every single person at every level. Total Quality Management is acknowledged as one of the superlatives means in effectively achieving edifying goals and objectives. Total quality management is a holistic approach to long-term success; however, it has not been widely used in school organization. Even the schools that espouse the TQM practices, they are still confronted with defies such as nonexistence of a guiding TQM framework, derisory human resource and resources, lack of governance and the discernment of TQM as a platform instead of a philosophy of unremitting enhancement. Juran's rule of thumb says that '85% of an organization's quality problems lie with management, as they have control over the system of the organization.'

In the wake of COVID-19 pandemic, most countries around the world have temporarily closed schools in an attempt to contain the spread. Many also began to plan for recovery, a phase that involves much more than reopening the gates and readmitting students. In this context, education policymaking is particularly difficult but will be strongest when it is: informed by accessible scrupulous verification; approached with a long-term perspective that prioritizes elasticity, communiqué, and trust; and is able to be adapted based on new data and information gained from neighborhood rendezvous and monitoring (Carvalho, Rossiter, Angrist Hares & Silverman, 2020). In United States of America, Schwartz (2020) highlighted that schools could have reopen in Fall but there was need to amend their health and safety practices. According to Schwartz (2020) there was need for the involvement of all education stakeholders in the country so as to uphold a supplementary cohesive response to the COVID-19 directives and protocols. Implementation of COVID-19 health protocols is more complex than placing desks six feet apart. In order to combat re-infection of COVID-19, education stakeholders had to strive to guarantee all systems and practices are intended at ensuring schools merchandise which fit for their purpose-innovative, proficient and of benefit to the societies (Schwartz, 2020).

In Europe, there were two problems when it came to reopening of schools (Furlong, 2020). The problems were the risks of opening the gates in opposition to the impending damage done by keeping them closed. Even additionally challenging was persuading anxious parents that now was the time to send their children back to school. These realities were not different from the Kenyan situation. When schools remain closed, there has been an increase in the risk of total loss of children education. School closure has led to an increase in early pregnancies which implied that the girls will be left out of school when schools re-open. Many more students could drop out of school due to lack of school's fees accredited to complicated financial factors among the parents. This is a pessimistic spiral to the progression that have previously been made in promoting Education for All (EFA) policy in the Country. Maintaining the health and safety of people and environments will be more important than ever before in the aftermath of the COVID-19 school closures. To make school environments safe, additional health and hygiene measures should be implemented in the schools. Priorities for education-focused efforts after the COVID-19 pandemic should include ensuring that school infrastructure and facilities are safe, that rooms are clean and disease-free, and that staff members are prepared to prevent the spread of disease in the event of a future outbreak. Evidence on the impacts of improving school-based health and safety measures remains thin and it should be strengthened as schools around the world reopen. Existing evidence points to the importance of making sure that schools are equipped with adequate health and hygiene infrastructure and monitoring capabilities this will involve students and staff practicing regular hand washing, accessibility of sufficient hand sanitizer and continuous screening of temperature and symptoms of students and staff (World Bank Group, 2020).

Crises and prolonged school closures has a negative impact on the well-being of children and adolescents. Evidence suggests that armed conflict and environmental disasters had multiple negative impacts on children and their families, including the potential to increase children's engagement in dangerous forms of work (Carvalho, *et al.*, 2020). Evidence from the Ebola crisis suggested that women and girls were disproportionately affected with increased cases of sexual exploitation and early marriage as a result of prolonged school closures (World Bank, 2020). Countries such as South Korea, Israel, Sweden and Denmark just to mention but a few that reopened schools without comprehensive safety protocols experienced a quick school closure because many teachers and learners became exposed to COVID-19 (Kuguyo, Kengne & Dandara, 2020). Based on the evidence that these countries are more developed than Kenya, Kenyan students and educators' vulnerability to COVID-19 pandemic cannot in anyway be underrated. It is worth to organize education departments and schools prior to reopening schools. Even if the focus is now on emergency measures, it is important to start designing post-pandemic actions to mitigate potential social and learning inequalities resulting from confinement. It is important to establish strategies for reopening schools taking into consideration higher or lower risk areas and create protocols to clean school premises before the beginning of classes.

In educational terms, it is important to establish ways to help students who had poorer access to distance education and assess which distance learning practices can be kept taking advantage of the structure that was put in place during the pandemic. It is also important to establish centralized actions for at risk groups such as youth at high risk of school dropout and highly socially vulnerable families, in addition to supporting low-income families to reduce the economic shock of the pandemic, which also affects children's return to school. It is against this background that the study was conducted to investigate how application of Total Quality Management (TQM) theory affect maintenance of health and safety of students and staff in aftermath of COVID-19 school closure in UasinGishu County, Kenya.

1.1. Statement of the Problem

Since schools were first shut down in mid-March, educators have struggled to offer distance learning and adapt to the unique challenges COVID-19 poses. Schools have resorted to distance learning programmes to facilitate dissemination of knowledge to their students (Barrero, Bloom, & Davis, 2020). However, this novel way of learning has been frothed with a myriad of challenges. Consequently, many students, educators and families have called for the reopening of schools. However, reopening of schools in a manner that is safe and responsive to the needs of families and communities could be faced with innumerable challenges. The Ministry of Education needs to sketch a blueprint for reopening of schools. Unquestionably, educational workers, especially teachers must be fully prepared and psychod to ensure safety and health of the students when schools re-open. The Ministry of Education needs to ensure that all public and private educational institutions are fumigated and disinfected. Therefore, the study was conducted to investigate how TQM theory could be applied to ensure safety and health of staff and students in the aftermath of COVID-19 school closure in UasinGishu County, Kenya.

1.2. Research Questions

The study was guided by the following research questions:

What is the effect of implementation of Deming 14 points on safety and health of students and staff Post-COVID 19 pandemic in public secondary schools in UasinGishu County, Kenya

To what extent does communication affect management of COVID-19 pandemic after reopening schools in UasinGishu County, Kenya?

To what extent does top management commitment affect management of COVID-19 pandemic after reopening schools in UasinGishu County, Kenya?

To what extent does training and development affect the management of COVID-19 pandemic after reopening secondary schools in UasinGishu County, Kenya?

1.3. Research Hypotheses

The study hypothesized that:

- H₁ There is a relationship between implementation of Deming 14 principles on safety and health of students and staff after reopening in public secondary schools in UasinGishu County, Kenya.
- H₂ There is a relationship between communication and health and safety of students and staff after reopening schools in Uasin Gishu County, Kenya.
- H₃ There is a relationship between top management commitment and health and safety of students and staff after reopening schools in public secondary schools in UasinGishu County, Kenya.
- H₄ There is a relationship between training and development on health and safety of students and staff aftermath of COVID-19 school closure in UasinGishu County, Kenya.

2. Literature Review

Winn and Green (2018) indicated that TQM is both a philosophy and a methodology. It can assist institutions to manage change by putting in place strategies for dealing with new external pressures. TQM when properly applied in education can bring out a transformation. It helps in the creation of an organization culture committed to continuous improvement (Krietner, 2000). However, TQM cannot solve all problems in a system and does not bring results overnight. It is a set of tools that can be employed in the management of educational institutions. Thus, if TQM is effectively implemented in the management of COVID-19 pandemic in public secondary school it will yield results. In Philippines, Llantos and Pamatmat (2016) investigated the Total Quality Management and school-based management practices of principals in Philippines. The study established that most of the TQM and SBM practices had significant impact to school leadership and improvement in high, average, and low performing schools in the Philippines. However, the study was conducted in the Philippines a more developed country as compared to Kenya. The study also focused on TQM and SBM on leadership and improvement of schools while the current study focused on application of TQM on the management of health and staff in the after COVID-19 school closure.

Sulistyorini (2015) conducted a study to investigate the Application of Total Quality Management in Islamic Education in Indonesia. The study sought to investigate how Total Quality Management in Islamic School fulfilled market demands of quality graduate. The study established that Islamic schools in Indonesia had been able to provide service management which involved weproviding service to the students by not charging them any fees for educational operational costs, accommodation, health assurance, and educational facilities such as books and courses in relation to educational process management, teachers taught their students using various teaching methods and strategies. In addition, teaching processes are conducted both indoor and outdoor. In terms of product management, there was continuously improvement of educational quality through various ways. The study findings illustrated that the application of Total Quality management was beneficial in providing Islamic graduate quality education. The study was however conducted in Indonesia a more developed country as compared to Kenya. The findings from Indonesia could also not be generalized on the Kenyan Situation due to their religious background differences based on the fact that it focused on Islamic cultures while the current setting has a mixture of both Christians and Muslims culture. The study also focused on application of TQM on education while the current study focused on the application of TQM on handling matters related to COVID-19 pandemic when schools re-opens to maintain health and safety of staff and students. The different timeline and difference challenges TQM was applied to handle makes the current study relevant and important to be carried out

In Malaysia, Taahyadin and Daud (2018) conducted a study to investigate the Total Quality Management in School. The study was conducted in a cross-sectional survey. A total of 375 teachers working in secondary school in Kedah were selected as respondents to answer the Total Quality Management in School questionnaire by West-Burham (1992). The findings of the study showed that there was a correlation between application of total quality management and school quality indicators. The findings also showed that some improvements were necessary in order to create a positive school culture environment and to generate student's excellence performance. The study commended that school leaders should be more proactive and wiser in managing a school.

In Thailand, Krataytong and Laksana (2015) conducted an evaluation of Development of Total Quality Management Model for Management of International Kindergartens in Bangkok. The research methodology was a mixed method involving both quantitative and qualitative data collection from content analysis and survey from school administrators. The study investigated the preference of school administrator based on Total Quality Management theory for management of international kindergartens in Bangkok. The result revealed that school administrators approved Total Quality Management as appropriate for international kindergarten management. The findings showed school administrators agreed with five elements which were ranked as the highest mean score which were Total involvement, Process control and improvement, Statistical process control, Evaluation and Education and training for international kindergarten managements areas. The findings also revealed that school administrators agree with the six considerations of Total Quality Management which were ranked as the second highest mean scores, namely, Leadership, Customer focus, Communication, Supportive structure, Reward and recognition and Supplier quality management could reinforce to international kindergarten management areas.

Ampofo, Ampomah, Amisah, Ebo and Manu (2020) investigated the role of teachers as frontline workers in the upsurge of COVID-19 Cases Amidst the Reopening of Schools in Ghana. This was attributed to increased cases of about 24% of teachers being increasingly infected with the novel disease. The study established that the major factors accounting for COVID-19 infections among teachers included inadequate preparation before reopening of schools, lack of understanding of the epidemiology of the disease, unavailability of PPEs, and psychological stress. The study recommend

that protection of students, teachers and non-teaching staff should be of topmost priority of the government through the education and training, provision of appropriate incentives, provision of PPEs and the requisite psychological support. In Nigeria, Salami and Ufoma (2013) conducted a study to investigate the Application of total quality management to the Nigerian education system. This was in the light of recognition that Total Quality Management (TQM) is an important management philosophy. Although many people assume that TQM model applies only to profit-making organizations, it can also be applied to non-profit organizations, service organizations, as well as the different levels of education. The study sought to describes the principles of TQM with emphasis on identifying the customer and analyzing the processes. The 14 points of Edwards Deming which form the framework for the implementation of TQM were individually applied to the academic environment based on the experience gained in higher education in Nigeria.

The study established that Universities had been slower to see the value of using TQM in their operations. One factor that is most critical to the success or failure of a TQM implementation effort is the universal endorsement, particularly at the top. If management is not completely sold on TQM, it is unlikely that the effort will be successful. The question of quality in education is directly related to the quality of teachers, students and infrastructure provided to them by the system. It can be argued that within the context of TQM it is the system that fails, not the individuals. TQM should be built upon a set of core values and concepts. A set of fundamental core values which form the building blocks of TQM include leadership and quality culture, continuous improvement and innovation in educational processes, fast response and management of information and partnership development, both internally and externally. TQM is capable of providing opportunity to conceptualize a systematic change in the education subsector.

In South Africa, Rampa (2014) investigate the Relationship between Total Quality Management and School Improvement. This was attributed to the poor functioning of a large number of the black schools and the urgent need to transform them was identified as a problematic phenomenon particular to post-apartheid South Africa. Notwithstanding various government interventions/initiatives (COLTS, Tirisano, Call to Action, Batho-Pele) for the improvement of schools aimed at correcting this situation, many schools remained dysfunctional and/or operated within a negative culture of teaching, learning and services. The purpose of the study was to determine whether or not the adoption of a TQM philosophy that complemented previous interventions could rectify the current situation.

To this end, an exhaustive literature review was conducted on COLTS, Tirisano and TQM prior to and during the empirical survey of dysfunctional schools in District D3 - Tshwane-North schools. The empirical design was eclectic in the sense that it included both qualitative and quantitative elements. Survey questionnaires, semi-structured interviews and unstructured observation were used to collect data in a case study of the District D3-Tshwane North schools, a triangulation process that enhanced the reliability and validity of the research findings. University of Pretoria etd – Rampa, S H (2005) Emerging from the survey and the literature review was the need for a different intervention strategy, one that would accommodate differences in and between schools rather than assuming the appropriateness of a 'one size fits all' intervention model. Based on the research findings emerging from the literature review and empirical survey it was concluded that such a model should be integrated into a TQM intervention framework that would be flexible enough to accommodate differences in schools with regard to contexts, needs, strengths and weaknesses. Drawing role players into new managerialism - and so into the new episteme may enhance the improvement of schools. The primary outcome of this research project, and the contribution made to new knowledge in the field, is the development of such an integrated framework, one which is not only theoretically sound but one which has been customized for South African conditions.

Kabendera (2018) conducted a study to investigate the extent to which Total Quality Management (TQM) Theory principles were being practiced in Government Secondary Schools in Ngara District, Tanzania. Mixed methods design was used, specifically convergent parallel mixed methods, whereby descriptive survey and ethnographic designs were employed for quantitative and qualitative data respectively. The research sample consisted of 8 heads of schools, 64 teachers, 160 students, 16 parents and 1 District Secondary Schools Education Officer (DSEO). The study employed questionnaires, interview guides, and observation guides to collect data from the participants. Both descriptive and inferential statistic was used to analyze data. The findings revealed that a good number of the principle's TQM were being practiced to less extent in Government secondary schools in Ngara district and most of the schools were not familiar with the common techniques which are used to implement TQM. Findings also showed that quality assurance and standards in schools in Government secondary schools in Ngara district was ineffective. In order to enhance quality education in Ngara district, the researcher recommended to the Government to emphasize TQM practices in its education system; increase capitation grants to the schools to enable the schools to buy adequate teaching and learning resources; to ensure that the suppliers (teachers, students in primary schools, book providers, etc.) meet quality standards among others. The study was however conducted in Tanzania while the current study was conducted in Kenya. The study focused on the extent to which TQM principles were being practiced in government schools while the current study focused on how TQM could be applied to handle matters of health and safety of students and staff members in Uasin Gishu County Kenya, post COVID-19 pandemic. Just as the current study the study employed mixed research methods and targeted the principals, teachers, students and quality assurance officers.

Kigozi and Yuen (2019) conducted a systematic review of literature on Total Quality Management (TQM) Practices Applied in Education Institutions. This study used a systematic review of the literature contained in the three databases ERIC, Science Direct and emerald insight. An analysis of the literature identified that top management commitment; continuous improvement and customer focus are the major total quality management practices applied in education institutions. This study was limited by three databases and search engines used and by the restricted number of keywords used in searching these sources. This systematic review of literature shows a gap in the existing research in that most

Total quality management researchers put more consideration to higher education and secondary education and less to primary and secondary education concerning total quality management practices.

3. Research Design and Methodology

3.1. Research Design

The study employed mixed research methods; ex-post research design and ethnography design. Ex-post facto research design, the allowed the researcher to investigate the variables of the study without manipulation. Ethnography design was used in this study to observe and find out measures that were being incorporated in secondary schools to ensure safety of students and teachers when schools re-open. The ethnographer observed measures to ensure social distancing, hygiene such as washing hands point, development of infrastructures to accommodate more students so as to ensure social distancing just to mention but a few.

3.2. Target Population

The target population in which the researcher generated the results was 184 principals in all the public secondary schools in UasinGishu County, Kenya.

3.3. Description of Sample and Sampling Procedures

Systematic sampling technique was employed to select a sample of 18 principals to participate in the study. The sample size was in conformity with Mugenda and Mugenda (2012) who asserts that for 10% of the accessible population is enough. The decision on the sample size was based on proportional allocation to ensure that the ratio of schools in the County was reflected in the sample.

3.4. Description of Data Collection Instruments

In this study, questionnaires and observation guide were used as instruments for data collection. Questionnaires were used to collect data from the principals. Both closed-ended and open-ended questionnaire were employed. Structured or closed-ended questions were used best for obtaining demographic information and other data that could be categorized easily. The researcher also used non-participant observation. This was preordained to scrutinize actions put in place to guarantee that there is wellbeing of teachers and students in public schools when schools re-open at the opportune time. In using observation technique the researcher used a structured observation checklist to observe: school and classroom environment (on cleanliness of school compound, availability of hand washing points in the schools, availability of water just to mention but a few); the researcher also observed measures being put in place to increase physical infrastructure to allow for room for social distancing when schools re-open.

3.5. Validity of the Instruments

Validity refers to that degree to which a test or research instrument measures what is expected to measure (Kothari, 2004). It therefore, attributes to the extent to which an instrument asks the right questions in terms of accuracy. Determining validity of the instrument is one indispensable characteristic of measurement that is considered in establishing the appropriateness and usefulness of instruments of measurements. To confirm the content validity of the instruments, the researcher consulted three experts from Ministry of Education and Quality Assurance.

3.6. Reliability of the Research Instruments

Reliability is a measure of degree to which a research instrument yields consistent results or data after repeated trials (Mugenda & Mugenda, 2003). The study employed test-retest technique. Answers obtained in the two administered tests were computed using the Pearson's Moment Correlation coefficient. A reliability index of 0.75 was considered reliable according to Orodho (2009).

3.7. Description of Data Analysis Techniques

Once feedback has been received the completed questionnaires were sorted to select the properly filled forms to ensure completeness and consistency in order to fulfil the research questions a descriptive analysis was employed. Data was coded and entered into the computer using Statistical Package for Social Science SPSS version. Descriptive statistics inform of means and standard deviation was used to analyze quantitative data. Chi-square was used to test the hypotheses.

4. Findings of the Study

4.1. Application of Deming 14 Principles of TQM and Health and Safety of Students and Staff

The study sought to investigate the extent to which application of Deming 14 principles affects health and safety of students and staff in the aftermath of COVID-19 pandemic school closure. The researcher requested the principals to indicate their opinion on how application of Deming principles would assist in the on maintenance of health and safety of students and staff. The response was rated on a five Likert scale and the findings were presented in table 4.2

Statement	Mean	S. Dev.
The school has created constancy of purpose for improvement of product and service to cater for the need of managing COVID-19 pandemic	3.64	1.29
The school is adopting to the new philosophy to help respond to COVID-19 pandemic	3.32	1.27
The schools will not depend on inspection to ensure it comply with the quality required to ensure safety and health of staff and students in post-COVID-19 era.	3.26	1.20
The award of tender to supplier to supply COVID-19 response materials such as hand sanitizers, personal protective equipment just to mention but a few will depend on quality and not price.	2.99	1.38
The school will improve constantly and forever every activity in response to COVID-19 pandemic in order to improve quality.	3.45	1.44
The schools will institute on-job training on COVID-19 evolution to ensure that the stakeholders are at par with every new information.	3.60	1.41
I, as the principal will Institute leadership on ways to respond to COVID-19 pandemic	3.39	1.42
As the principals I will driving out fear of the teachers and staff by allowing them to suggest on ways of managing their safety and health and that of the students	3.51	1.41
The schools will strive to eliminate barriers for role players to work efficiently and effectively in promoting safety and health of staff and students post-COVID-19.	3.45	1.42
The school will eliminate slogans, exhortations, and targets that demand zero defects and new levels of productivity and instead improve the school system to effectively promote health and safety of students and staff post-COVID-19 pandemic	3.47	1.41
Eliminate numerical quotas for the staff and goals for management such as performance appraisal and merit in post COVID so as to support team work in the management of COVID-19 Pandemic	2.93	1.47
The school will remove barriers that rob staff of their pride of work	3.39	1.40
The school will institute a vigorous program of education and retraining for everyone to new methods of school-based management, including group dynamics, consensus building, and collaborative styles of decision making to help combat COVID-19 pandemic	3.65	1.52
The school is planning a way in which all the educational stakeholders are put to work to accomplish the transformation geared towards the management of COVID-19 pandemic	3.24	1.42

Table 1: Application of Deming 14 Principles and Health and Safety of Students and Staff in Aftermath of COVID-19 Pandemic
Source: Survey Data, 2020

The study established that schools that are employing Deming 14 principles of TQM have better chance of maintaining health and safety of students and staff in aftermath of COVID-19 school closure. The study established that the schools that have established constancy of purpose for improvement of product and service to cater for the need of managing COVID-19 pandemic and have adopted new philosophy to help respond to COVID-19 pandemic were better placed in the management of COVID 19 pandemic. The study also established that the schools will not depend on inspection to ensure it comply with COVID-19 containment measures such as social distancing, wearing of masks and provision of WASH facilities will ensure safety and health of staff and students in post-COVID-19 era. The study also highlighted that the award of tender to supplier to supply COVID-19 response materials such as hand sanitizers, personal protective equipment just to mention but a few should depend on quality and not price.

The study also highlighted that the schools will institute on-job training on COVID-19 evolution to ensure that the stakeholders are at par with every new information, institute leadership and driving out fear of the teachers and staff by allowing them to suggest on ways of managing their safety and health and that of the students will respond better to the health and safety measures in the aftermath of COVID-19 school closure. This will be achieved in institution that will strives to eliminate barriers for role players to work efficiently and effectively and improve the school system to effectively promote health and safety of students and staff post-COVID-19 pandemic by eliminating slogans, exhortations, and targets that demand zero defects.

The study also established that removal of barriers that rob staff of their pride of work and institution of vigorous program of education and retraining for everyone to new methods of school-based management, including group

dynamics, consensus building, and collaborative styles of decision making to help combat COVID-19 pandemic. The TQM principles will be effectively achieved in school that will plan way in which all the educational stakeholders are put to work to accomplish the transformation geared towards the management of COVID-19 pandemic. In the wake of COVID-19 pandemic, the purpose of the school system must be clear and shared by all stakeholders. There should be a clear understanding of the Pandemic by the school board members, administrators, teachers, support staff, parents, community, and students. Customer needs in this case the safety and health of students and staff must be the focus in establishing educational aims. The aims of the system must be to improve guarantee safety and health of all students and staff in addition to providing quality education.

4.2. Communication and Health and Safety of Students and Staff after Schools Reopen

To evaluate the effect of communication on students and staff safety and health after schools re-open post COVID-19, a chi-square test was conducted. To check if there existed significant difference, a chi square was computed at 95% confidence level and the results are presented in Table 2.

4.2.1. Decision Rule

If p- value is less than or equal to 0.05 reject the Null hypothesis. If p- value is greater than 0.05 do not reject the Null hypothesis.

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	7.325 ^a	4	.001
Likelihood Ratio	8.090	4	.132
Linear-by-Linear Association	3.126	1	.140
N of Valid Cases	18		

Table 2: Chi-Square Tests

The null hypothesis tested was that communication had no significant relationship with health and safety of students and staff in aftermath of COVID-19 school closure. The results show that the values are $\chi^2=7.325$, $df=4$ and $p=.001$ (Table 2) which was less than the level of significance 0.05 thus the researcher rejected the null hypothesis which suggests that there exists a significant relationship ($p<0.05$). The findings implied that there is a relationship between communication and maintenance of health and safety of staff and students in the aftermath of COVID-19 pandemic school closure in UasinGishu County, Kenya. The findings implied that effective communication with all the education stakeholders such as parents, students, teachers, support staff and administrators in secondary school would go a long way in ensuring that the staff and students are safe in aftermath of COVID-19 school closure.

4.3. Top Management Commitment and Health and Safety of Students and Staff When Schools Re-Open Post COVID-19

The study also sought to investigate the effect of top management commitment and maintenance of health and safety of students and staff in the aftermath of COVID-19 pandemic school closure. To check if there existed significant difference on the statistics presented above, a chi square was computed at (0.05) significance level the results are presented in Table 3.

4.3.1. Decision Rule

If p- value is less than or equal to 0.05 reject the Null hypothesis. If p- value is greater than 0.05 do not reject the Null hypothesis.

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	10.087	4	.039
Likelihood Ratio	9.634	4	.047
Linear-by-Linear Association	1.740	1	.187
N of Valid Cases	18		

Table 3: Chi-Square Tests

The null hypothesis tested was that top management commitment had no significant effect with maintenance of health and safety of students and staff in aftermath of COVID-19 school closure in UasinGishu County, Kenya. The results showed that the values were $\chi^2=10.087$, $df=4$ and $p=0.039$ (Table 3) which was less than the level of significance 0.05. The findings revealed that there was a positive and significant relationship between top management commitment and health and safety of staff and students in aftermath of COVID-19 school closure. The findings implied that active participate of education stakeholders in decision making processes, promotion of work ethics, high morale and popularise the TQM model and top management leadership and demonstration of seriousness by top management to quality implementation in the school will help in maintaining the health and safety of staff and students in aftermath of COVID-19 pandemic school closure.

4.4. Training and Development and Maintenance of Health and Safety of Students and Staff in Aftermath of COVID-19 School Closures

The last research question of the study was to investigate the effect of training and development in maintenance of health and safety of students and staff in the aftermath of COVID-19 school closure. The findings were analyzed and presented in table 4.4. To confirm the significance of the result, a chi square was computed at 95% confidence level. The results are illustrated in Table 4.

4.4.1. Decision Rule

If p- value is less than or equal to 0.05 reject the Null hypothesis. If p- value is greater than 0.05 do not reject the Null hypothesis.

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	8.196	2	.017
Likelihood Ratio	8.012	2	.018
Linear-by-Linear Association	4.036	1	.045
N of Valid Cases	18		

Table 4: Chi-Square Tests

The null hypothesis tested was that there is no significant relationship between training and development and maintenance of health and safety of staff and students in aftermath of COVID-19 pandemic school closure. The results showed that the values are $\chi^2=8.196$, $df=2$ and $p=0.017$ (Table 4.5) which is less than the level of significance 0.05. The researcher rejects the null hypothesis. The findings implied that training and development of teaching and non-teaching staff on safety measures, use, cleaning and re-use of personal protective equipment, cleaning and disinfection of classrooms and areas of study were effective in maintaining health and safety of staff and students in the aftermath of COVID 19 school closure.

The researcher was of the opinion that strategies to prevent COVID-19 among educators and students in Kenya should start with the training and education of teaching and non-teaching staff safety measures according to the updated protocols as issued by the WHO. The education should include, information on the type of virus, its transmission, disease signs and symptoms, vulnerable groups and prevention and management protocols. Training workshop for teachers should include the proper use, cleaning, re-use of face masks and shields and personal hygiene. In addition, guidelines must be issued to protect individuals and prevent transmission of COVID 19 infection to teachers, nonteaching staff and learners. Moreover, standard cleaning and disinfection measures for classrooms, dormitories and staff bungalows should be performed religiously to further prevent the spread of the virus and minimize the risk of cross infection.

5. Conclusions of the Study

The study concluded that the schools that will employ the Deming's 14 principles will have an efficient and effective way in implementing containment measures to ensure the safety and health of the students and staff when schools reopen in the aftermath of COVID-19 school closure. The study also concluded that there was a positive and significant relationship between communication and maintenance of health and safety of students and staff in schools, the study established communication to all the stakeholders will go a long way in easing the anxiety among parents, students and staff on reopening of schools. Constant and effective communication will also ensure all the stakeholders are informed on the proceeding of schools in containment of COVID-19 pandemic.

In relation to top management communication and maintenance of health and safety of staff and students, the study concluded that schools that will have leadership strategies that will allow all the role players to participate in decision making will be at a better position to maintain the health and safety of students and staff in the aftermath of COVID-19 school closure.

In relation to training and development, the study concluded that training and development of teaching and non-teaching staff on safety measures, use, cleaning and re-use of personal protective equipment, cleaning and disinfection of classrooms and areas of study will be effective in maintaining health and safety of staff and students in the aftermath of COVID 19 school closure.

6. Recommendations

The study commends that more emphasis should be put in place to ensure safety and health of students and staff in schools when schools re-open after COVID-19 school closure.

The study also recommended that school administrators should employ more communication channels to ensure that the parents, teachers, students and all other stakeholders are well informed on the COVID-19 proceeding in schools when schools re-open.

7. References

- i. Altunay, E. (2016). The Effect of Training with TQM on the Perceptions of Teachers about the Quality of Schools. *Universal Journal of Educational Research* 4(9): 2126-2133.

- ii. Ampofo, E.T., Ampomah, R. Kofi, P. A. R., Owusu, S. E., Opuku, M. M. (2020). The Upsurge of COVID- 19 Cases amidst the Reopening of Schools in Ghana: The Role of Teachers as Frontline Workers. *International Journal of Secondary Education*. 8(3), pp. 93-99.
- iii. Barrero, J. M., Bloom, N., & Davis, S. J. (2020). *Covid-19 is also a reallocation shock* (No. w27137). National Bureau of Economic Research.
- iv. Carvalho, S., Rossiter J., Angrist, N., Hares, S. & Silverman, R. (2020). *Planning for School Reopening and Recovery after COVID-19. An Evidence Kit for Policymakers*. Center for Global Development, Fifth Floor Washington, DC.
- v. Ejionueme, L. K. &Oyoyo, O. A. (2015). Application of Total Quality Management (TQM) in Secondary School Administration in Umuahia Education Zone. *Journal of Education and Practice*, 6 (27), pp. 102-111.
- vi. Llantos, B. G. M &Pamatmat, F. V. (2016). Total Quality Management and School Principals: Their Implications to School Leadership. *International research journal of social sciences*, 5(8), 1-7.
- vii. Jamaa, A.S. (2010). The effectiveness of applying total quality management in Public Senior High School in Indonesia. *Journal of Education*, 3(1), pp. 25-35.
- viii. Kabendera, D. (2018). Total Quality Management (TQM) Theory Practices in Government Secondary Schools in Ngara District, Tanzania: The Extent the Principles of TQM Are Being Practiced. *International Journal of Information Research and Review* 05(01), pp.4982-4992.
- ix. Kavutai, M. (2018). *Effects of Total Quality Management Practices on Performance of Public Secondary Schools in Makeni County*. Unpublished Master in Business Administration of South Eastern Kenya University.
- x. Kosgei, J. M. (2014). *The Extent and Practice of Total Quality Management in Secondary Schools in Kenya: A Study of Secondary Schools in Eldoret East District* Unpublished Master of Education of Moi University.
- xi. Kuguyo, O., Kengne, A. P., &Dandara, C. (2020). *Singapore COVID-19 Pandemic Response as a Successful Model Framework for Low-Resource Health Care Settings in Africa?* OMICS: A Journal of Integrative Biology.
- xii. Lindzon, J. (2020). *School closures are starting, and they'll have far-reaching economic impacts*. Fast Company, 11-13.
- xiii. Malik, R. S. (2018). Educational challenges in 21st century and sustainable development. *Journal of Sustainable Development Education and Research*, 2 (1), 9-20.
- xiv. Owusu-Fordjour, C., Koomson, C. K. and Hanson, D. (2020). The impact of Covid-19 on learning-the perspective of the Ghanaian student. *European Journal of Education Studies*, 7 (3), 88-101.
- xv. Ruinge, M. W &Kimani, G. N (2015). Relationship Between Selected Total Quality Management Practices Employed by Public Secondary Schools Principals and Students' Performance in Kenya Certificate of Secondary Education in Kiambu County, Kenya. *International Journal of Education and Practice* 3(2), pp. 66-79
- xvi. Salami, C. G. E &Ufoma, A. O. (2013). Application of total quality management to the Nigerian education system. *Global Advanced Research Journal of Educational Research and Review* Vol. 2(5) pp. 105-110.
- xvii. Suleman, Q. & Gul, R. (2015). Challenges to Successful Total Quality Management Implementation in Public Secondary Schools: A Case Study of Kohat District, Pakistan. *Journal of Education and Practice*, 6(15), pp. 123-134.
- xviii. Taahyadin, F. &Daud, Y. (2018). Total Quality Management in School. *IOSR Journal of Business and Management* 20 (6), pp.07-13
- xix. United Nations Education Scientific and Cultural Organization (2020). *COVID-19 Educational Disruption and Response*. Retrieved from: <https://en.unesco.org/covid19/educationresponse>.
- xx. Viner, R. M., Russell, S. J., Croker, H., Packer, J., Ward, J., Stansfield, C. &Booy, R. (2020). *School closure and management practices during coronavirus outbreaks including COVID-19: a rapid systematic review*. The Lancet Child & Adolescent Health.
- xxi. Wani, A. F. &Mehraj, K. H. (2014). Total Quality Management in Education: An Analysis. *International Journal of Humanities and Social Science Invention*, 3 (6), pp.71-78.
- xxii. Winn, C. R. & Green, S. R. (2018). *Applying Total Quality Management to the Educational Process*. Centennial Blvd., USA
- xxiii. World Bank (2020). Educational Policies in The Covid-19 Pandemic: What Can Brazil Learn from The Rest of The World? World Bank Geneva.