European Journal of Business and Management
ISSN 2222-1905 (Paper) ISSN 2222-2839 (Online)
Vol.5, No.31, 2013

Evaluating the Accra Polytechnic Examination System for Total Quality Management Principles

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Abstract

A critical review of the examination process of Accra Polytechnic was done in order to generate flowcharts which could be used in improving the process of the examination system. A qualitative descriptive research was used to examine the examination process of Accra Polytechnic using TQM principles. A Cross-Sectional Study of a sample of employees of Accra Polytechnic. Structured questionnaire were used to elicit responses from a non-random sample of 100 members of staff. Out of this, 96 members of staff, made up of 32 Administrative staff and 64 lecturers including current and former Deans and former Vice Rectors of the institution filled and returned their questionnaires. Questionnaires were distributed by hand to a sample of 100 staff of Accra Polytechnic. Flowcharts were assessed for compliance to the principles of TQM. Three stages were identified in the Examination process as "Before Examinations", "During Examinations" and "After Examinations". There was leadership commitment and employee participation, but no operational Quality Policy, recognition and reward for deserving staff, customer satisfaction surveys, and benchmarking, and training limited to invigilators only.

Keywords: Total Quality Management (TQM), Examination, Flowchart Assessment

1. Introduction

Examination is a written, practical and spoken test that schools and colleges organise in order to get their students a promotion or a qualification. It is the only way the Polytechnic assesses its students in order to determine the type of grades they obtain which in turn determines the students' status in the Polytechnic during the school years i.e. either to be withdrawn or to continue. After completion, the grades the students obtain are also determined mainly by their examination results. From the above, it could be seen that Examination is a very important process in the effective running of a tertiary education including the Polytechnic.

1.1 Statement of the Problem

Examinations are a core function of educational institutions and Quality is considered to be very important in Examinations.

In Ghana, the National Board for Professional and Technical Education (NABPTEX) is the body mandated to supervise the conduct of polytechnic examinations, releases results and issues Higher National Diplomas (HNDs) and other certificates.
Each Polytechnic has its own unique procedures for assisting NABPTEX to fulfill its mandate.
However, there have been several complaints from the public concerning the late release of results by NABPTEX (Takoradi Polytechnic, 2010). This indicates shortcomings in the examination systems in the Polytechnics.

The examination system can be improved through the application of TQM. Total Quality Management is a systematic way of guaranteeing that all activities within an organisation happen the way they have been planned. It is a management discipline concerned with preventing problems from occurring by creating the attitude and controls that make prevention possible. It is also about efficiency, productivity and long-term success.

According to Smith (1994) process improvement is the backbone of a successful TQM programme and must be clearly understood by all those involved.

The critical steps of process improvement are:

1. Create a flowchart of the process.
2. Measure performance
3. Collect and analyse the data.
4. Formulate the improvement proposal.

The aim of this study was to do a critical review of the examination process of Accra Polytechnic in order to generate flowcharts which could be used in improving the process of the examination system.

2. Literature Review

Literature review focuses on Total Quality Management in service industries. Most organisations are interested in the quality of their products or services due to its potential to market share expansion, lower cost of production, productivity improvement, increase in turnover and prestige.

2.2 TQM in service industries

According to Saunders and Graham (1992) TQM originated in a manufacturing environment and its terminology and techniques have largely been developed in that environment. Its application in a service environment therefore requires adaptation of the ideas to a different set of circumstances.

The major distinctions between service and manufacturing organisations are that the product: is intangible and ephemeral; is perishable; frequently involves the customer in the delivery of the product; is not perceived as a product by employees (Enrick, 1986):

The intangible nature of the service as a product means that it could be very difficult to place quantifiable terms on the features that contribute to the quality of the product. This could make measurement of the quality of the product a problem for TQM.

As service products are perishable, they cannot be stockpiled and must be produced 'on demand'. The result is that the process for delivering a service may be highly complex involving the co-ordination of primary and support systems in what is usually a very time sensitive relationship with the customer. In the case of a service organisation time is regarded as an assessable quality or feature of the product. Total quality management (TQM) focuses on quality as the key to success.

The 'Quality Triangle' summarises the components of TQM.

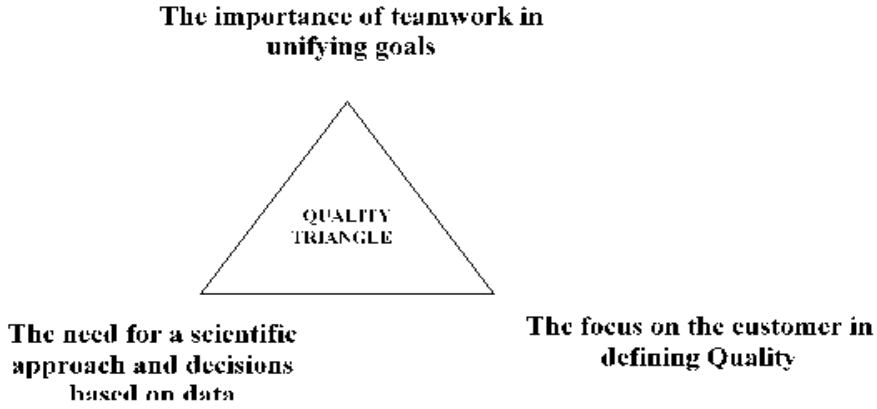

Figure 1: Quality Triangle (Saunders & Graham, 1992)

The 'Focus on the Customer' is very much a part of the provision of a service. The concept of 'Teamwork' is less immediate. The intangible nature of the product may make it harder for each individual to see that they are contributing to a common goal: Whereas a person making a physical object can usually readily identify the next step in the process, and identify their contribution to the final product and its quality, a clerk in the accounts receivable section of a hospital may find it difficult to identify their customers and see how the quality of their work will affect the final product. However, the difference is one of degree and simply requires, as in manufacturing, that each person be made aware of the value of their role in producing a quality product and be allowed to contribute to continuous improvement in the product.

A more fundamental difference between manufacturing and service industries lies in the third corner of the triangle: the 'Scientific Method'. The critical difference between manufacturing and service industries in the application of TQM is in the area of quality measurement. This involves the use of measurements and a scientific

approach to problem solving in the search for ongoing improvement in quality.

The issue of measurement still remained a problem. Only feedback from 'How do you rate us?' Indirect measures of employee satisfaction were used to measure their performance. Like all such measures, they are received too late to prevent a problem affecting a customer.

Service quality, which always involves the customer as part of a transaction, will therefore always be a balance: the balance between the expectations that the customer had and their perceptions of the service received. A 'high quality' service is one where the customer's perceptions meet or exceed their expectations.

According to Smith (1994) the process improvement process is the backbone of a successful TQM programme and must be clearly understood by all those involved. He proposed the following steps for process improvement.

2.3 The critical steps of process improvement

2.3.1. Create a flowchart of the process.

Translating an existing process into a flowchart form is a critical element of understanding the steps involved. The flowchart breaks the process down into component parts and identifies suppliers, customers, and time-frames for each step. In order for a flowchart to be useful, it must contain sufficient detail to show who does what, at what time during the process.

For a process that is fairly broad in scope, it may be necessary to do a main flowchart and then separate flowcharts for sub-processes. After outlining the steps, each step should be analysed to determine whether or not it adds value for the customer. The ultimate goal of process analysis is to identify opportunities to eliminate non-value-added steps, reduce the time it takes to complete others, and reduce the amount of rework to correct errors.

2.3.2. Measure performance

The flowchart describes the existing process. Performance measures provide objective ways to quantify the work being done at each stage of the process.

Performance measures generally involve assessments of time (delays, time to perform a task), rework (rejects or deviation from acceptable standards), output (work done per person or department), customer satisfaction (complaints, renewals, and survey results), and costs (work hours saved, materials wasted or saved).

3. METHODOLOGY

The purpose of this study was to create flowcharts of Accra Polytechnic Examination System and assess them for TQM principles.

This chapter focuses on the study design, the population from which the respondents were selected, the sample and sampling procedure used in collecting the data study instruments and it finally discloses the analytical tools or techniques used for the data analysis procedure. .

3.1 Research Design

The research design shows how the research questions are connected to the data, and the tools and procedures use in answering them.

For conducting empirical research, there are two research approaches of data collection: Qualitative and quantitative. The qualitative approach allows researchers to study selected issues in depth and in detail. The quantitative method, on the other hand, requires the use of standardised instruments so that the varying perspectives and experiences of people can fit a limited number of predetermined response categories, to which numbers are assigned. The advantage of a quantitative method is that it is possible to measure the reactions of a great many people to a limited set of questions, thus facilitating comparison and statistical aggregation of the data.

A qualitative descriptive research was used to examine the examination process of Accra Polytechnic using TQM principles.

A Cross-Sectional Study approach was used which involved a one-time survey of a sample of employees of Accra Polytechnic.

3.2 Population

The population of this research comprises 100 the employees of Accra Polytechnic whose work schedule are related to the organisation of examination and those in managerial positions. Based on this predetermined criteria, the purposive or judgmental being a non-random sampling technique was used to collect the data. This was chosen because it enables the researcher have a reliable answer to research questions.

3.3 Sample and sampling procedure

Structured questionnaire were used to elicit responses from a non-random sample of 100 members of staff. Out of this, 96 members of staff, made up of 32 Administrative staff and 64 lecturers including current and former Deans and former Vice Rectors of the institution filled and returned their questionnaires. Sample was judgmentally selected to enable the researcher answer her research questions. Unlike random sampling which gives a population size an equal opportunity for any element in the population to be selected; judgmental sampling is done using the discretion of the researcher. Judgmental sampling also known as a non-random sampling or purposive sampling uses the researcher's personal judgment in selecting the participants for the survey based on certain characteristics (Fraenkel and Wallen, 1990). The basis for selecting judgment sampling over random sampling is to ensure accurate and representative information is gathered for the research area (Marshall, 1996). The sample for the study had to be members of staff whose job schedule are examinations related in the Polytechnic.

According to Patton (1987) the sample should be large enough to be credible, given the purpose of evaluation, but small enough to permit adequate depth and detail for each case or unit in the sample. The research however far exceeded the minimum desirable sample size of 20.

3.4 Data Collection Procedure

Information was obtained by questionnaires and interviews. Questionnaires were distributed by hand to a sample of 100 staff of Accra Polytechnic.

4. RESULTS AND DISCUSSIONS

The results were analysed in order to identify the sequences of events involved and to evaluate the events for TQM principles.

This was done by first creating flowcharts (Fig 2-10) of the examination system and evaluating them.

4.1 The Examination Process of Accra Polytechnic

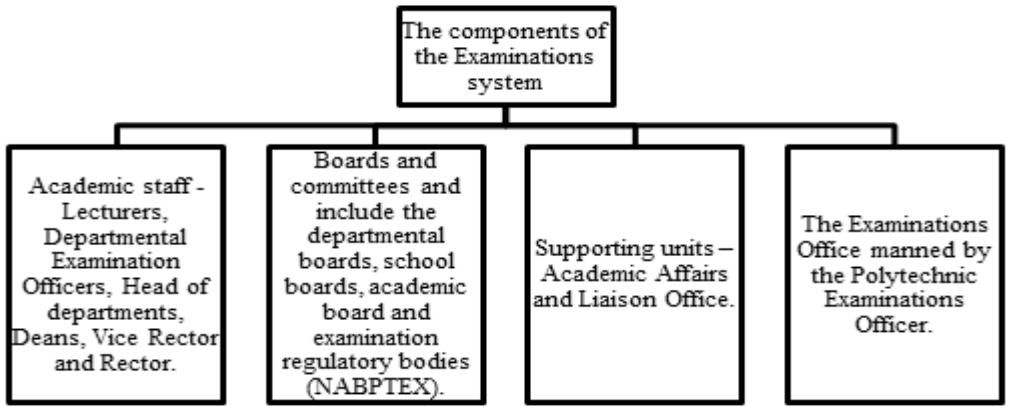

Figure 2: The components of the Examinations system of Accra Polytechnic:
Source: Field Survey, 2010

The process can be divided into three sequences.

Processes before Examinations

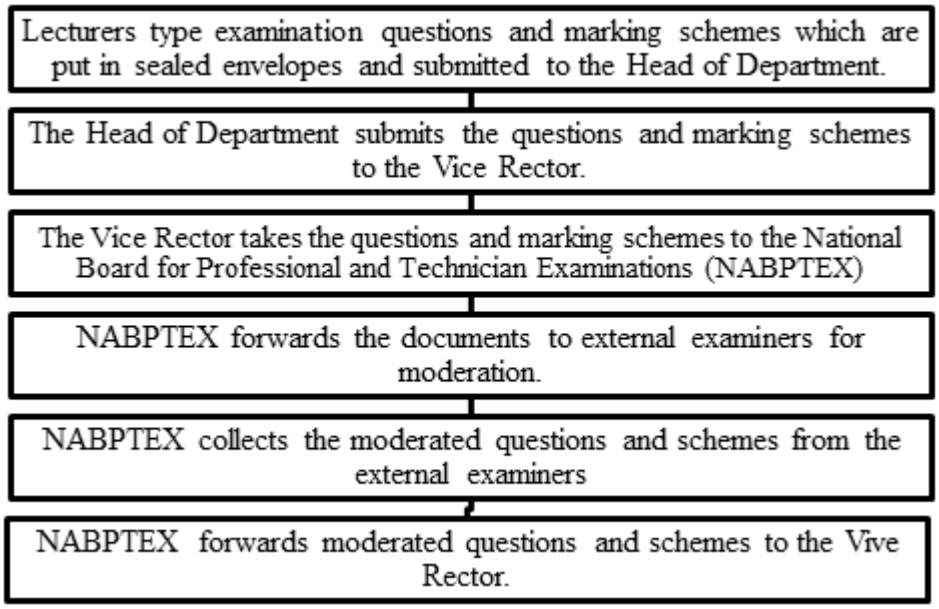

Figure 3: Flowchart of the processes before examinations
Source: Field Survey, 2010

In the event that the external examiners report indicates that corrections have to be made to the questions before they are administered to the students, then the lecturer goes to the Vice Rectors Office and does the corrections on the computer. In this case the questions do not leave the Vice Rectors office before they are sent to the Exams Office.

In the event that the external examiner accepts the questions and schemes as set (i.e. without need for corrections) the questions only are handed over to the examinations officer one day before the paper is written.

A provisional examinations timetable is made available to the lecturers and students. The student's copies are posted on the general notice board together with the allocated seat numbers for individual students.

The necessary logistics like stationery (answer scripts, supplementary sheets, graph sheets, drawing sheets, etc), printing inks, writing material (markers, pens, pencils, etc), are procured before the examinations begin.

An orientation seminar is organised for Potential Invigilators to train them on their duties and responsibilities during examinations.

After getting feedback from the students and lecturers on problems identified on the provisional timetable the necessary modifications are done to obtain the final examination timetable.

Copies of the final timetable are then made available to the lecturers and students. The HCIM Department, Estates Office and Accra Polytechnic Security Office are also provided with copies of the final timetable to enable them plan for refreshments, venues, and security during the examinations.

4.1.2 Processes during the Examination:

This stage has five steps outlined in the flow charts.

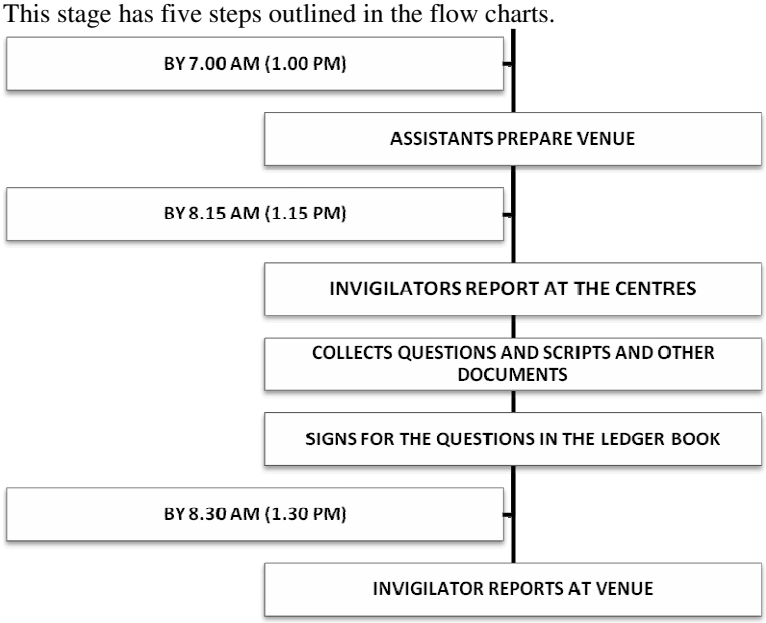

Figure 4: Step 1 of the processes during examinations
Source: Field Survey, 2010

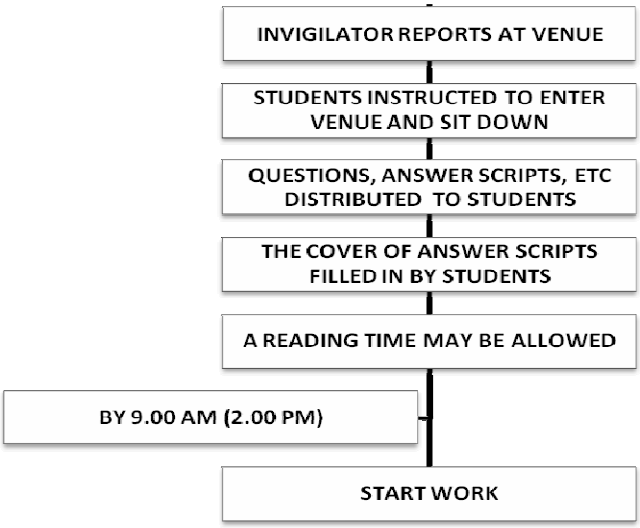

Figure 5: Step 2 of the processes during examinations
Source: Field Survey, 2010

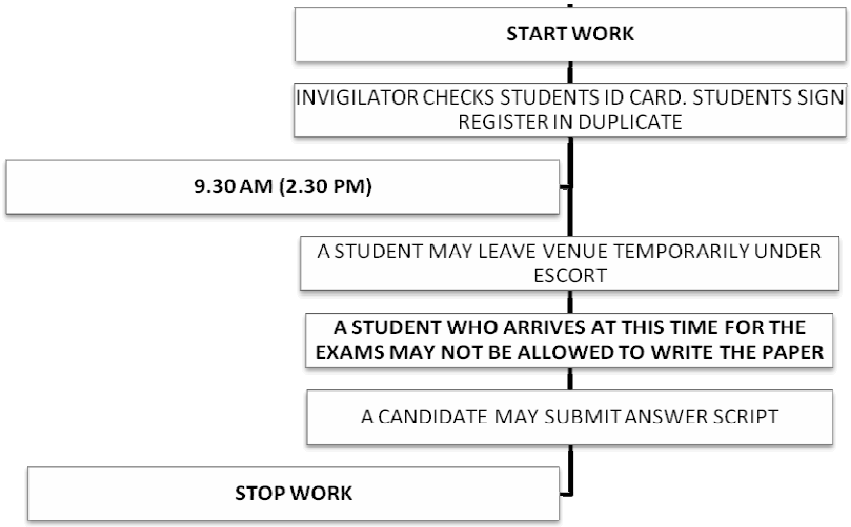

Figure 6: Step 3 of the processes during examinations
Source: Field Survey, 2010

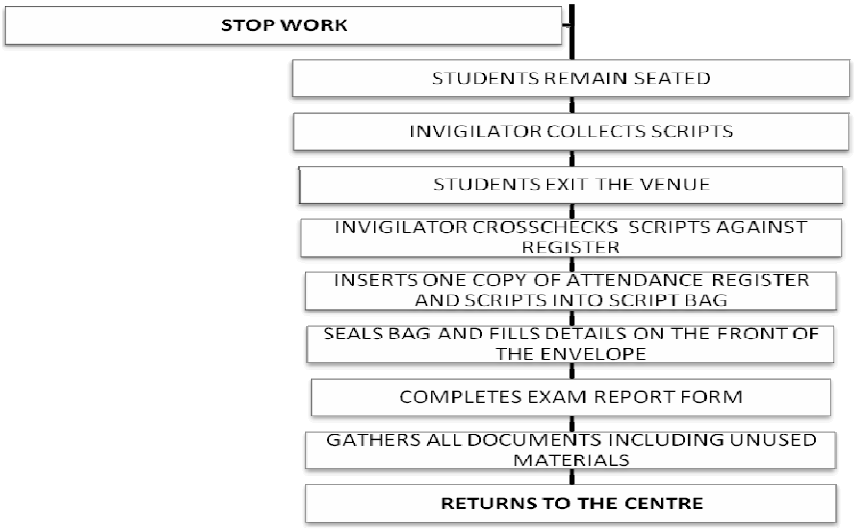

Figure 7: Step 4 of the processes during examinations
Source: Field Survey, 2010

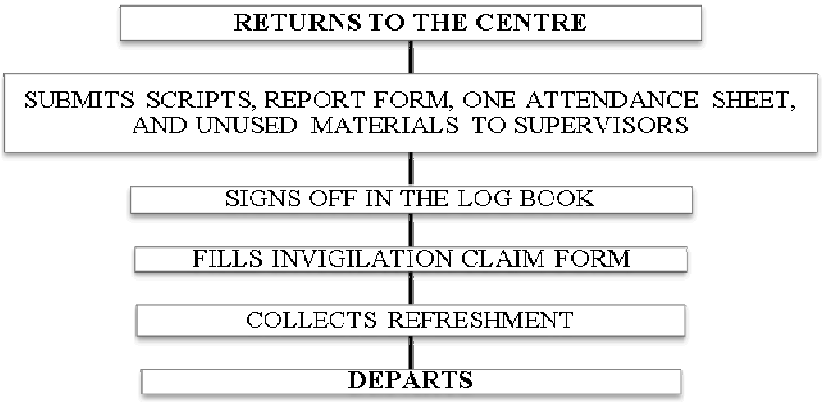

Figure 8: Step 5 of the processes during examinations
Source: Field Survey, 2010

4.1.3. Processes after the examination:

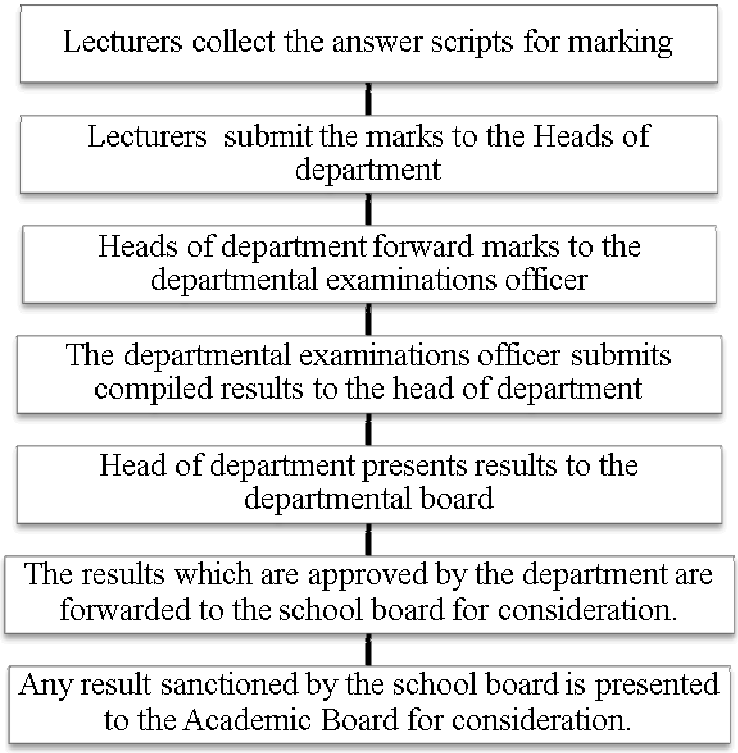

Figure 9: Flow chart of the processes after examinations
Source: Field Survey, 2010

When the results are ratified by Academic Board, the department then has the authorisation to publish the results for the students. Copies of the ratified results are submitted to the Department of Academic Affairs for preparing transcripts for students.
The ratified results of final year students are sent to NABPTEX for the issuance of certificates.

Three major stages were identified in the Examination process of Accra Polytechnic: before examinations, during the examination and after the examination.

4.2 Flowcharts Assessment
The flowcharts were assessed for compliance to the principles of TQM indicated by Saraph, Benson, Schroeder (1989); Flynn, Schroeder and Sakakibara (1994); Ahire, Waller, and Golhar (1996) which are Leadership Commitment, Policy and Plan Statement, Evaluation, Process Control and Improvement, Quality System Improvement, Participation of Staff, Recognition and Reward, Education and Training, Customer Focus, and Benchmark.

4.2.1 Leadership commitment
This is evident through the involvement of various levels of leadership in the examination process. Departmental heads ensure that results are compiled and discussed at departmental board meetings (Fig 9). They ensure that deadlines are met for the submission of marks to the department and submission of compiled results to the school board for consideration. The deans convene school board meetings where the results of all departments in the school are discussed. The deans submit the schools results to academic board. The academic board which is chaired by the Rector is the final authority on the release of results in the Polytechnic (Fig xxx). The board is made up of the leadership of the institution and includes the Vice Rector, Deans, Heads of Departments, etc.

4.2.2 Quality Policy
The examination process does not make reference to any operational Quality Policy. According to the ISO 8402 (1994) an examination quality policy would indicate the overall intentions and direction of the examination system with regard to quality, as formally expressed by the top management of the institution (ISO 8402, 1994). The quality policy would involve statements that would be brief, clear, and believable. In order to improve the

conduct of examinations the policy should also indicate detailed quality goals, tactical goals and strategic goals. Quality goals are statements of the desired quality results to be achieved within a specified time. Tactical goals are short range (e.g., 1 year) and strategic goals are long range (e.g., 5years) (Feigenbaum, 1991; Juran and Gryna, 1993). Some Quality goals for examinations may include performance, reliability, and conformance to benchmarks, and internal failure costs.

4.2.3 Evaluation

There are various steps in the process where evaluation is done. Examination questions and schemes are sent through NABPTEX to external examiners for assessment. At the departmental board, school board and academic board levels examination marks and compiled results are evaluated in order to verify their accuracy and to assess the overall performance of the students. It was noted that process of evaluation is limited only to the results. Other areas of the examination process like submission of questions, invigilation, marking of scripts, timely submission of marks, and other operations are not evaluated.

4.2.4 Process Control and improvement

According to Juran and Gryna (1993), a process refers to the unique combinations of machines, tools, methods, materials, and people engaged in production. Process control and improvement therefore refers to a set of practices which are implemented to control and improve the utilisation of machines, tools, methods, materials, and people engaged in production or the delivery of services. Before the start of the examinations, potential invigilators are taken through an orientation as a means of improving their delivery during the examinations. Students are also sensitised on examination rules and regulations through seminars and notices. This plays an important role in controlling the behaviour of the students during examinations.

4.2.5 Quality System Improvement

The examination process outlined (Figures 2 - 8) do not indicate any steps meant to achieve quality system improvement. According to ISO 8402 (1994), the examination quality system comprises of the organisational structure, procedures, processes and resources needed to implement quality management of examinations. ISO 8402 (1994) and ISO 10013 (1995) indicate the importance of having a documented quality system with written procedure which would contain the purposes and scope of all activities during examinations; what shall be done and by whom; when, where and how it should be done; what materials, equipment and documents shall be used; and how it shall be controlled and recorded. The document shall also describe the activities of individual functional units (e.g. Examinations Office, Invigilators, Examination Assistants, Vice Rector's Office, Academic Departments, and Deans Office) needed to implement the quality system elements. There should also be Work instructions containing detailed work documents to guide people in conducting specific works (Randall, 1995; Mirams and McElheron, 1995). For example, there should be instructions detailing the sequence of activities that an invigilator should do so that every invigilator would follow the same procedure in the discharge of their duties. However, there are no documented Work instructions available for examinations.

4.2.6 Employee Participation

The examination system at Accra Polytechnic promotes employee participation through job rotation, and team-based work. Staff from various departments are formed into various groups and assigned tasks during examinations (as evident in Fig.2 to Fig. 8). Top management usually delegates the teams and is therefore committed to assigning sufficient resources in the forms of time, money, and personnel to the teams. The teams are normally disbanded after their tasks are completed. Team work brings people from different departments to work together and learn from each other. Any problems encountered during examinations are solved easily this way (Dale, 1999; Mann, 1992). Centre Supervisors coordinate the work between the main Examinations Office and the Invigilators. These centre's are normally headed by the Academic Deans and are assisted by teaching staff from various departments and Invigilation Assistants who are recruited from outside the institution. The Invigilation Assistants work in groups, with each group assigned to a specific centre. The Assistants job is to assist the Estates Department set up the examination venues, and also assist the invigilators. The Printing Team is located in the Main Examinations Office and they assist the Polytechnic Examinations Officer to print the questions and bag them in sealed envelopes. The team responsible for managing and issuing stationery is located in the main examinations office. Their task is to issue answer scripts to the various centres and venues according to the number of students registered to write the examinations. The assigning of tasks to teams ensures that employees work in groups and it enhances job satisfaction (Finlay and Martin, 1995). Top management must also encourage staff involved in the examination system to submit suggestions for improving the system for consideration (Bergman and Klefsjö, 1994; Dale, 1999; Juran and Gryna, 1993).

Juran and Gryna (1993) stated that the most important benefit of quality cycle is their effects on employees' attitudes and behavior. Quality circle enable the individual to improve personal capabilities, increase the individual's self-respect, and help employees change certain personality characteristics. They increase the respect of the supervisor for the employees, increase employees' understanding of the difficulties faced by supervisors, and increase management's respect for employees. They change some employees' negative attitudes to the firm, reduce conflict stemming from the working environment, help employees better understand the reasons why many problems cannot be solved quickly, and instill in the employee a better understanding of the importance of product quality.

4.2.7 Recognition and Reward

The examination process does not make reference to any recognition and reward for staff that have excelled in the discharge of their duties during the examination process. Some of the areas which could be considered for recognition are staff who regularly submit their questions and marks on time, invigilators who report regularly and punctually for duty and discharge their duties in the examination rooms efficiently, examination office staff who manage to conduct examinations without any leakage of questions, departments and schools which are able to submit error free results, and on time, departments whose students are not involved in examination malpractices. Public recognition is an important source of human motivation (Deming, 1986). Quality can be improved by recognising the improved performance of any individual, section, department or division involved in examinations (Dale and Plunkett, 1990). The Polytechnic should also acknowledge excellent employee performance or suggestions in order to encourage employee participation in quality management (Ishikawa, 1985).

4.2.8 Training

According to Hackman and Wageman (1995), training is the second most commonly used TQM implementation practice in the United States. Companies invest so much to train their employees at different levels. Deming (1986) stated that without proper training workers would find it difficult to improve their work. According to the examination process quality related training is given to members of staff handling examination related issues, but this is restricted to the orientation of invigilators before examinations begin. Apart from invigilators no such training is given to inividuals of other functional units of the examination system such as the Examination Assistants, Answer Scripts Issuing Staff, Staff involved in the printing of questions, etc. Management should therefore make provision and encourage members of staff to accept quality awareness education in order to improve their commitment to quality in examinations.

4.2.9 Customer Satisfaction

The examination process does not include customer satisfaction surveys which would assist in taking immediate action on customer complaints, identify problems requiring general corrective action, and provide a quantitative measurement of customer satisfaction (Juran and Gryna, 1993). According to Kanji and Asher (1993), the future success or failure of examinations in the Polytechnic can be predicted from the satisfaction of customers (students, parents, Government, general public). The information obtained can help the institution improve the quality of its examination system

4.2.10 Benchmarking

Competitive benchmarking is the continuous process of measuring products, services, and practices against leading companies (DuBrin, 1995). Benchmarking is an effective tool for guiding companies of quality improvement goals, evaluating various activities within the company, and assessing customer requirements Hackman and Wageman (1995). The three leading tertiary institutions in Ghana are the KNUST, University of Ghana, and University of Cape Coast. The Polytechnic must therefore benchmark its examination activities to any of these.

5. Conclusions

TQM principles are not well developed for the examination system of Accra Polytechnic. This shows that a total quality management model related to the Accra Polytechnic Examination System has to be developed. TQM should be implemented to improve the quality of the examination system in Accra Polytechnic.

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