Adapted Model to Improve E-Learning System output by Improving Total Quality Management in Egypt

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Abstract

This research, the reasons for the being of a gap between the electronically higher education output and the employment market needs and requirements has been examined, by trying to improve the higher education inputs which, in go, include four main factors: staff members, students, course contents, and the facilities. An integrated model was designed including 3 main elements in the three factors of inputs in the light of quality management concept. The current gap was proved by the information collected through the exploratory study at hand and the increasing number of the unemployment rate in the Egyptian economy in the last few years was identified. The study discovered the quality concepts related to improving the quality of higher education output, including the quality of staff members, course contents, students, and facilities. Also, the research also explains the different types of models in higher education. The future work will show the three important factors in proposed system will provide to be positive; this means that there is a significant relationship between the quality of staff members, course content, students and higher educational output at education systems in Egypt.

Keywords : *CT,E-Learning, Quality, TQM, VLE, CQI, SQM, LMS, MLE, EDM, DSS, DM, MIS,Visualization.*

1. Introduction

Higher education on virtual learning or as called on E-learning currently places greater importance on meeting student's expectations and needs. As universities continue to become more student-oriented, learners' perceptions of higher educational facilities and services are becoming more important [1]. Universities, in particular, represent one of the important supports that modern civilizations depend on in order for them to understand social and economic development in the most comprehensive way. The role of universities, in the current age, has been concluded with the speed of scientific discoveries and technological innovations speeding that is the matter which has a massive effect on labor market's requirements [1]. The researcher examines the reasons accounting for the existence of a huge gap between the higher education output and the labor market needs or requirements in Egypt, and how far this surprise is established in the increase of unemployment rate. Unemployment happens when an individual has the will to work or is seeking a job but does not have any tangible opportunities to have any. The frequency of unemployment can be measured by means of identifying the unemployment rate which, in go, is defined by the percentage of individuals who hold no jobs in the labor force. Exploratory Data Analysis (EDA) is an approach adopted by the researcher to analyze data for the purpose of formulating worthy of testing and complementing the tools

of conventional statistics for testing results [2]. The researcher conducted an exploratory study to assess the output of the higher education in the labor market in Egypt to find if there is a gap between the output needs and the labor market requirements. The researcher further investigates the requirements needed as well as the weaknesses interviewers face in dealing with higher education graduates seeking new jobs in these companies which represent the output of the higher education process. The research generally arranged that, in most cases, they find a gap between the higher education output and the requirements of the available jobs within the organizations. The common requirements and problems that face most of the managers can be summed up as follows. Graduates should:

- Have a good command of one/more languages.
- Project a high degree of responsibility and due carefulness at work.
- Work properly under stress.
- Be presentable.
- Have passable computer literacy skills.
- Develop effective presentation skills.
- Be trustworthy, and find work challenging and interesting.

Most of the quality models commonly practiced in the business world have been adapted and used in the education sector. The research is proposed to examine the quality issue in higher education from the marketing perspective; that is, to understand the customers' needs by means of their perception of quality.

The main aim of the study is to assess the quality attributes of higher education from students' and faculty members' perspectives. The study then classifies these quality attributes using the Input–Process–Output framework. With the information obtained from this study, an approach is further proposed, which include a variety of quality practices that help manage quality issues in higher education. The fundamental motive behind the present study is represented in contributing and improving the efficiency of the outputs of academic education to be matched with the labor market's requirements. In a casing, the objectives of the study are to:

1. Construct an integrated model to improve the higher educational output in Egypt.
2. Recognize the degree of satisfaction of the graduates in regards to the educational services given.
3. Realize the comprehensive quality application on education's inputs.
4. Recognize the mode of improving the educational inputs, to be matched with the labor market requirements.

2. Related Work

There are several previous studies discussed related issues in quality of education.

The study suggests that an essential prerequisite to the design of instruments for measuring quality in higher education is an appreciation of the complexities associated with the nature of quality measurement and enhancement in higher education. The central role of perceptions and expectations and the complexity of the contributions of the different types of customer are crucial. It explores the following issues: what quality is, which quality is important, and the ownership of quality. It identifies aspects of the educational experience that differentiate education from other service experiences as including exclusivity of access, the role of the customer in the process, and the longitudinal nature of the educational experience.

The study also proposes the concept of a service contract to be established in the first instance with students, as one approach to managing expectations and perceptions in order to generate more positive quality judgments [3].

The study introduced an analytical report on higher education in Egypt arguing that the Egyptian policy must take into account the realities of declining government budgets and employment, and the increasing need to rely on the private sector, which must become more competitive internationally. Previous policy, which expanded higher education rapidly (despite a persistently high rate of illiteracy) and guaranteed jobs to university graduates, resulted in over-enrollment and poor educational quality. Currently, the government strategy is to stabilize the number of university students and raise the quality of instruction, expand the role of two and four-year technical institutes, increase the use of pedagogical materials in instruction, and promote innovative interdisciplinary programs that stress problem solving and applied work. A concluding section examines current responses and reforms of the government, employers, students and universities [4].

The study explores the notion of quality measurement and describes the role of an enterprise-wide, technology-based continuous Quality Measurement System (QMS2000) in the quality assurance program at the University of Louisville. QMS2000 is a relational, interactive information system that includes data from 273 students, alumni, faculty, staff, and employer satisfaction surveys that are linked to corresponding databases at the university [5].

The study reports findings on teaching effectiveness and feedback mechanisms in Kenyan universities, which can guide management in developing a comprehensive quality control policy. The study adopted an exploratory descriptive design. Three public and two private universities were randomly selected to participate in the study. A random sampling procedure was also used to select 79 respondents to participate in the research [6].

This study reviews recent research, literature, and the views of a small sample of senior managers and academics in English higher education institutions on the challenges associated with embedding quality. When implemented by a university, quality enhancement models such as total quality management and the European Foundation for Quality Management need to be fitted in sympathetically with the organization's culture and structures. If embedding is to occur, there needs to be a careful consideration of the opportunity costs of the various options that could bring about the necessary transformative change. The importance of transformative leadership and the creation of a conducive organizational culture are also explored, as are the major indicators of success. Senior managers and other change agents face major challenges but, by achieving the goal of embedding quality, students would receive greatly improved higher education and, as a consequence, their country's economy and society would also prosper [7].

3. Quality Management Concepts

The research tries to relate the higher education inputs on E-learning to quality management concepts which are staff members, students, course content and facilities. There are various well-known definitions of quality. Quality as conformance to requirement while quality as fitness for use [8]. Quality as a predictable degree of uniformity and dependability at low cost and suited to the market is more towards quality in operation. Many organizations found that the old definition of quality, "the degree of conformance to a standard", is too narrow and consequently have started to use a new definition of quality in terms of "customer focus". It is reported that many companies had initially concentrated all their efforts on improving internal processes with little or no regard for the relationships between those processes and the organization's ultimate customers. This failure to include the customer focus

had resulted in companies struggling hard to survive and resorting to fire-fighting situations. In the context of higher education, due to the intangible nature of their processes, there is considerable discussion on the notions of educational quality. Quality perspectives have evolved in higher education over the years by going through a shift from experience to technique to style and finally to process [9].

There are a number of researchers who have formulated frameworks for quality improvements. These frameworks have been given different names such as Continuous Quality Improvement (CQI), Strategic Quality Management (SQM) or Total Quality Management (TQM). Even though there might be some differences among these approaches, the term TQM is considered to be more general to capture the essence of quality improvements. There are many definitions of TQM. TQM as a strategic architecture requiring evaluation and refinement of continuous improvement practices in all areas of business. TQM is a management philosophy that builds a customer-driven, learning organization dedicated to total customer satisfaction through continuous improvement in the effectiveness and efficiency of the organization and its processes [10].

4. E-learning

E-learning therefore is an approach to facilitate and enhance learning through, and based on both computer and communications technology. Such devices can include personal computers, CD-ROMs, Digital Television, PDA.s, and mobile phones. Communications Technology (CT) enables the use of the Internet, email, discussion forums, collaborative software and team learning systems. The use of web-based education systems has grown exponentially in the last few years, encourage by the fact that neither students nor teachers are bound to a specific location and that this form of computer-based education is virtually independent of any specific hardware platforms [11]. Specifically, collaborative and communication tools are also becoming widely used in educational contexts so, as a result, Virtual Learning Environments (VLE) are installed more and more by universities, community colleges, schools, businesses, and even individual instructors in order to add web technology to their courses and to supplement traditional face-to-face courses. Such e-learning systems are sometimes also known as a Learning Management System (LMS), Course Management System (CMS), Learning Content Management System (LCMS), Managed Learning Environment (MLE), Learning Support System (LSS) or Learning Platform (LP) [12].

These systems can offer a great variety of channels and workspaces to facilitate information sharing and communication between participants in a course, to let educators distribute information to students, produce content material, prepare assignments and tests, engage in discussions, manage distance classes and enable collaborative learning with forums, chats, file storage areas, news services, etc. [11][12].Some examples of commercial systems are Blackboard, WebCT, TopClass, etc. and some examples of free systems are Moodle, Ilias, Claroline, etc. Nowadays, one of the most commonly used is Moodle - Modular Object Oriented Developmental Learning Environment- which is a free learning management system that enables the creation of powerful, flexible and engaging online courses and experiences. These e-learning systems accumulate a vast amount of information which is very valuable for analyzing students' behavior and could create a gold mine of educational data [13]. Learning management systems accumulate a great deal of log data about students' activities. They can record whatever student activities are involved, such as reading, writing, taking tests, performing various tasks, and even communicating with peers.

The traditional development of e-learning courses is a difficult activity in which the developer usually the course teacher has to choose the contents that will be shown, decide on

the structure of the contents, and determine the most appropriate content elements for each type of potential user of the course. Due to the complexity of these decisions, a one-shot design is hardly feasible, even when it is carefully done. Instead, it will be necessary in most cases to evaluate and possibly modify the course contents, structure and navigation based on students' usage information, preferably even following a continuous empirical evaluation approach [12].

E-learning system can use different technologies that describe and predict the knowledge and improving TQM from student's usage, to concern on devolving education system such as data mining techniques and called Educational Data Mining (EDM). EDM is an emerging discipline, concerned with developing methods for exploring the unique types of data that come from educational settings, and using those methods to better understand students, and the settings which they learn in. A key area of EDM is mining computer logs of student performance. Another key area is mining enrollment data. Key uses of EDM include predicting student performance, and studying learning in order to recommend improvements to current educational practice. EDM can be considered one of the learning sciences, as well as an area of data mining. A related field is learning analytics [15] as shown in Figure 1.
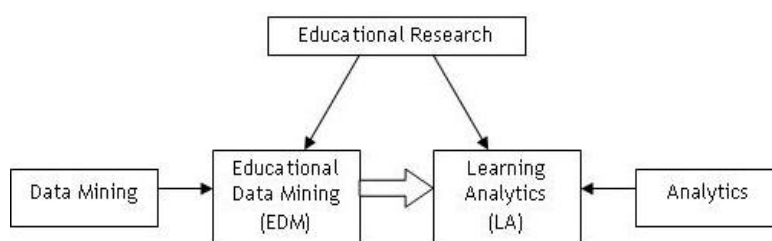

Figure 1. Educational Data Mining (EDM) [14]

5. Implement Quality Management in E-learning

Many researchers from higher educational on E-learning institutions are still uncertain about adopting TQM in education [16]. There are pointed out that one should differentiate between education and business. The usage of images by researchers while comparing education with industry, he emphasizes that in higher education, achieving high grades as a measure of success in implementing TQM is a major misunderstanding of the principles of TQM. Therefore the following blocks are important to stand in mind:

The first major block for the application of TQM in education is the misunderstanding of TQM philosophy and the lack of understanding the processes that are different in education as compared to industry. This could be due to lack of the necessary knowledge about TQM.

Another block to both industry and education in implementing TQM is lack of proper leadership [17]. Leaders should be able to set viable corporate vision and be willing to initiate change and provide the resources needed for team efforts directed towards achieving the vision. TQM should be included as a strategy by the top management and they should get clearly committed to its philosophy.

A third block could be employees' resistance to change. In the case of higher education, most of the employees are mostly professionals who by custom expect autonomy and academic freedom. Academic staff may not like being asked to rethink their teaching styles [18]. Educational professionals may be more devoted to teaching than to TQM. Further, it is a common belief that TQM adds unnecessary layers of bureaucracy [19] which is not a preferred domain amongst academic professionals. Hence, it may not be possible for them to adopt TQM principles in a short span of time.

Fourth, in higher education, poor curriculum design could lead to quality failure. There could be unsuitable academic systems and procedures that serve as a bottleneck while imposing changes in curriculum or course delivery [20]. [21] Feels that much of TQM implementation in education fails to address the fundamental questions about learning and more specifically whether the curriculum is engaging in the relevant learning processes. Further, with TQM, there could be too much of documentation of processes, which consumes time and effort.

A fifth barrier for TQM in education could be the lack of sufficient funds and resources. TQM involves a paradigm shift in the mindset of the entire organization. This can be achieved through systematic and strategic training of all the employees. The educational organization may not have the required expertise to train the staff and may look for external consultants for training, especially to suit the requirements of education. Hence, TQM involves high cost, effort and time [22].

A. Quality of the Academic Staff Member in E-Learning

In first hand, teaching quality factors [23] believes that in order to enhance the teaching quality of instructors, it is essential that instructors know what factors and criteria are closely related to the professional development of an instructor. These factors have been studied from different perspectives. From the perspective of instructors' behavior, some believe that the following five behavior characteristics can be used to measure the teaching performance of instructors: clarity of lecture, vividness of teaching material, enthusiasm of instructors, methodical course arrangement and willingness to help students in their studies and self-development. From the perspective of quality management, believe that a set of excellent teaching provisions should have: clear institutional aims and curricular content, good preparation/structuring by the instructor, and active involvement from the students and the institution's concern about the overall effectiveness of administrative and management structures.

From the perspective of teaching, [24] believes that qualified instructors should be able to upgrade students' capability effectively, enhance their knowledge and skills, improve their behavior and attitude, and encourage them to make contributions to the organizational goal. From the perspective of learning scenario design, [25] believe that instructors should attach importance to the following factors: students' perception, their motivation and sensibility, development in the society and Individual differences

In another hand, The management cycle of teaching quality Since [26] put forward the concept of "Wheel of quality improvement (management cycle)", many theses related to the project management, processes management, cycle control and organizational framework of the system have successively applied the concept to help decision-makers get control of the functions and characteristics of the system. The "Wheel of quality improvement" includes four steps, Plan, Do, Check and Action (PDCA). In the "Plan step", the decision-maker will first get to know the core of the issues and determine the policy and target for the solution and further plan the organizational function and relevant tasks. In the "Do step", besides the relevant tasks and assignments being carried out according to the plan, the completeness of the operating process will also be confirmed. During the "Check step", besides the activity results being assessed by the established assessment factors, new issues will probably be discovered. Finally, in the "Action step", besides those with excellent achievements rewarded, the improvement direction and issues for the cycle will be determined. In general, the "Wheel of quality improvement" has the function of eliminating or improving different issues, and represents the collective strength of an organization for the accomplishment of a common goal [27].

B. Quality of the Course Content in E-Learning

In course evaluation in process assessing the quality of teaching is a complex process as it involves many incorporeal factors. [38] Have adopted survey questionnaires as the method for assessing the quality of teaching.

- Step 1: Select the course to be evaluated
- Step 2: Prepare the terms of reference for course evaluation
- Step 3: Conduct the course evaluation
- Step 4: Prepare an evaluation report of the findings
- Step 5: Prepare an action plan with improvement measures
- Step 6: Implement the action plan for continuous improvements
- Step 7: Monitor the action plan for continuous improvements

C. Quality of Students in Higher Education

TQM movement, TQM originated in manufacturing; however the mechanistic standardized production emphasis inherent in the movement causes considerable discomfort when applied to education [28]. The application of TQM principles to higher education was seen as a way of making the sector more relevant and responsive to the needs of employers and other sectors of society including funding agencies [29]. The basic principles of TQM as applied to higher education are as follows: Delight the customer, People-based management, Continuous improvement and Management by fact.

D. The Adapted model for e-learning

The Adapted model in e-learning for higher education is the combination of processes used to ensure that the degree of excellence specified is achieved in higher education process. This model is the sum of the activities and information an organization uses to enable it to better and more consistently deliver products and services that meet and exceed the needs and expectations of its customers and beneficiaries, more cost effectively and cost efficiently, today and in the future.

The integrated model in e-learning for higher education designed this model to improve e-learning for higher education inputs which is the staff members, course content, students and facilities in order to reach desired output in the long term effect based on total quality management concept in each part of the model.

The integrated model in e-learning for higher education contains three main factors as described before staff member, course content and students. Every factor contain several points comprise improving by quality management, as shown in Figure 2.
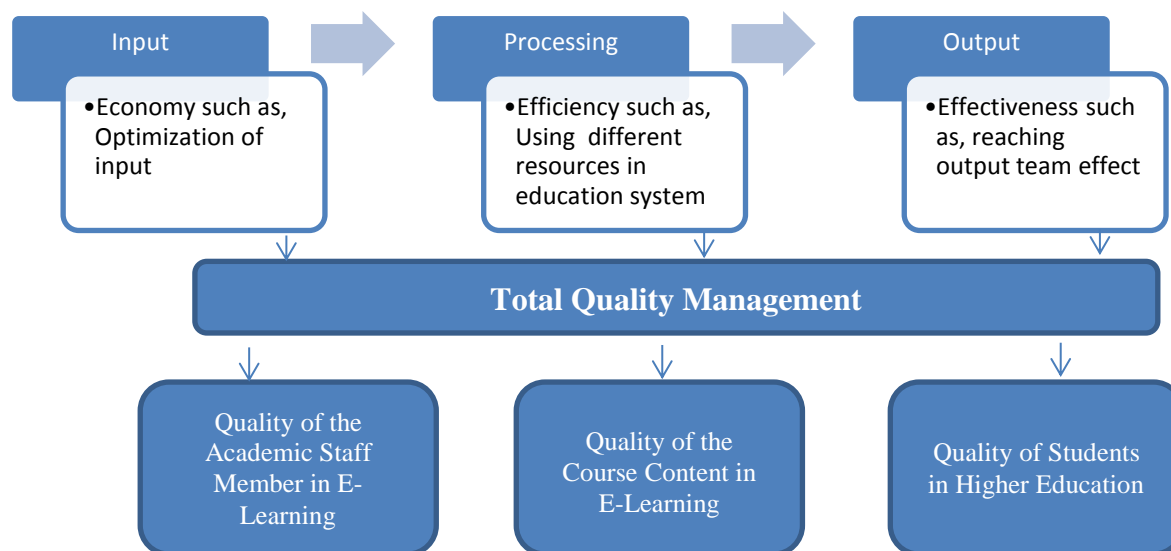
Figure 2. The Adapted model in e-learning for higher education

In first step of adaptive model is the input the expected data to insert to TQM system about quality of the academic staff member in e-learning, it will effect on economy side and increase optimization of input for student which will use e-learning. Second step the processing focus on important factor refer to course content which applied on e-learning system and the results will effect on efficiency such as different resources in education system. The third step, it considers the result and feedback of proposed system. It will increase the third factor or criteria called effectiveness on team. After implementing this model the result will measure and evaluate the value of proposed system.

6. Conclusions

The study building the quality concepts related to improving the quality of higher education output, including the quality of staff members, course contents, students, and facilities. Also, the research also explains the different types of models in electronically higher education. This means that there is a significant relationship between the quality of staff members, course content, students and facilities and higher educational output at education systems in Egypt, and significant relationship between the quality of staff members, course content, students and facilities and electronically higher educational output at education system in Egypt.

7. Future work

In future work apply an integrated model on a case study using questionnaires will aiming to reveal students' opinions about the quality of higher education in the E-learning system in Egypt. The data using questionnaires was further analyzed and comparisons were drawn between the opinions of the staff members and those of the students, using the Analysis of Variance (ANOVA) test to reveal if there is a significant difference between the responses of the staff members and students in the three branches. Also multiple comparisons between the three branches were made using the Least Square Difference method (LSD) to find which branch has the most discrepancies.

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