A Study of Quality Management Systems in Serve Education Assessment: Meaning and Implications

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Abstract

This paper stretches the characterisation of quality management systems and models that is abundant in literature by assessing the capability of the most common of the systems and models. Multiple data gathering and processing techniques were used within the context of a constant comparative approach in which data, theories and cases were plugged into each other. Based on the performed research, obtained outcomes suggest the presence of numerous opportunities and benefits in using quality management systems. Based on the findings, further work needs to be done to create the conceptual, managerial and behavioural competences that should facilitate the embedment of the quality management models into the daily lives of education institutions. A critique of quality management through the lenses of the disciplines of team learning, systems thinking, shared vision and mental modelling and of the Six Sigma, roadmaps should engender a new approach to improving quality in education. It should be of interest to explore the potentials of hybridising quality management models in education.

Keywords: *Quality Management Systems, Six Sigma Roadmaps, Creative Tension, Systems Thinking, Mental.*

1. INTRODUCTION

Quality management systems (QMSs) abound in literature with much of it focusing on describing them and the contexts of their inceptions. Performed research indicates that a number of scholars have described social imageries of World Class Universities (WCU), Better Schools Programs (BSP), Star Schools Projects (SSP) and other versions of the imageries of types of best performing education institutions. Literature has however, reported on numerous ingredients for high quality performance but remained ambivalent about whether there is a singular methodology of accomplishing high-level customer satisfaction in education. This chapter uses a synthetic-evaluative approach to critique the capability of the various QMSs used in education. It also explores how institutional quality performance can be bettered by paying attention to the context in which the model is adopted. The next section starts by dissecting the concept of QMS, detailing the three constituent elements: quality, management and system. Understanding each component of a QMS in its individuality should help in building a picture of how a QMS can be at the service of a student-focused and market-oriented education delivery system. The chapter presents a comparative structural analysis of the various quality management models and critically analyses the meanings and implications in each category.

2. QUALITY MANAGEMENT SYSTEMS

There are three perspectives to QMS which will be discussed below so as to appreciate the scope of what a QMS should sound like in its philosophical perspective, methodological outlay and performativity implications. The perspectives are quality, management and system. Each acts as a gear engaging with the others and yet powered each by an overarching question about its purpose in a QMS infrastructure. a. Quality—What is the institution's conception of quality and the methodology of doing 'quality'? b. Management—Is the institution's strategy plan on quality integrated and aligned with its vision of quality? c. System—How does the institution's strategy, culture, structure, rewards, behaviour, etc. support its own model of quality? A QMS is as useful as its ability to serve as a coherent framework for systematically integrating, aligning and focusing institutional and business processes. The

focusing of business processes should help the institution in accomplishing its network of objectives and infrastructure of goals effectively and efficiently. Effectiveness and efficiency of processes ensure maximisation of customer satisfaction. Such a scope of QMS has intriguing implications on the structure of the organisation, its culture, knowledge management practices and customs. It has further implications on the technological co-efficiency of the organisation at all levels of the processes deployed across the institution.

Quality

Literature variably refers to quality as 'slippery', 'mobile', 'elastic' and 'elusive' [1]. Notwithstanding, the chapter conceives quality as referring to an expression of satisfaction with the constitution, form and performance of a good based on the beholders' conditionality of time and space. The value or worthy a person assigns to a good can appreciate or depreciate dependent on time and environment or space in which one finds himself. Nonetheless, quality is generally perceived as a representation of complex mix-and-match of qualities and variables embodied in products and services. The functional relationship has been captured by [2] in Eq. (1).

$$EduQuali = \sum_{j=1}^{k} (P_{ij} = E_{ij}) \quad (1)$$

where EduQUAL is perceived education quality of student 'i', k is the number of education attributes/items, P is perception of student 'i' with respect to performance of an attribute 'j' of institution, E is the education quality expectations of student 'i' for an attribute 'j'. It should be noted that customers do not always assign the same importance to any characteristic or feature permanently. The ever increase in the numbers and peculiarity of substitute and complimentary products/services and even features complicates the Education system's comprehension of the package of features that would best meet customer needs and wants. Thus, the measure of quality education depends on the skill with which the various stakeholder voices are integrated, processed and escalated into features of the institution and its related deliverables such as courses and programs. Such features include, but are not limited to:

a. institutional structure,
b. institutional facilities,
c. program and course content,
d. delivery modes and
e. instructional interaction at the student-teacher interface.

Defining quality in terms of the integration of different 'voices' disarms higher education institutions (HEIs) of the prerogative to define quality in their 'own terms' and the quality assurance agencies from single-handedly imposing the yardsticks of quality assurance (QA) [3].

3. MANAGEMENT

Management has been focused through the lenses of a planning process, provision of leadership, staffing, organising, monitoring and controlling, all with the aim of achieving effectiveness and efficiency across the institution. Good management is about boundary spanning and gluing people of same and different dispositions around the institution's vision, mission and operations. The proclivity for turf-warring, group-think and de-generation into clinches is high in multi-stakeholder and multi-layered institutions [4]. In such contexts, management needs to be good at dealing with political game-playing and the emergence of power-seeking mates. It therefore must be effective and efficient on two main strategies: encouraging and resourcing favourable ideas and actions and weeding elements of negative monolithic politics. Balancing the two strategies creates the space for maturation of quality management infrastructures. QMSs are more effective and efficient in the hands of experts and those willing to become better by de-learning, (re)learning and supporting alternatives to their own proposals as long as such alternatives are more sound and productive [5]. The personal quality of allowing personal positions to be contested and fecund by others (constructive vulnerability) is a critical success factor in consulting for and co-creating institutional values, missions and visions [6]. This disposition to defencelessly and proactively feel at ease with 'constructive vulnerability' however takes long to develop. There are some 14 Best Practice Principles (BPPs) that [7] argue that they smoothen the management for quality in institutions:

a. Being disciplined: this BPP refers to the application of a strong systems perspective in all structural, functional and behavioural aspects of the institution. The systems perspective must be vision-driven and buttressed by policy and standards.
b. Being time-based: this BPP means the institution values time as a competitive tool and resource of critical developmental value. Therefore time should not be wasted, for instance, in pursuing non-value creating ideas and activities.
c. Being up-front: a BPP that expresses employees' high moral probity in their valuing of honesty, humility and sincerity in all their interactions and relations.
d. Creating customer value: a BPP expressing the strength of the institution's mental model of customer needs and wants, and how management, products and services delivery should be derived therefrom. The implication is that management; teachers and everyone in the institution must treat the other as their customer and understand what the other treats as value at their role level.
e. Creating strategic capabilities: a BPP that expresses how institution-business capabilities are defined, understood and shared as key determinants of continuous improvement (CI) and customer satisfaction performance plans.

SYSTEM

A system is an organised, purposive structure consisting of interdependent components that perpetually, but variably influence one another. Education and QM infrastructures are both deliberate purpose-driven systems. Any education is bestowed with a number of goals and objectives just as any quality management model is charged with a number of goals and objectives. A QMS applied to education should consist of a corpus of integrated, aligned, complex elements that relate in some sophisticated way. Educational systems consist of personal or human elements and impersonal or non-human components like buildings, machines, etc. While the 'hard elements' dealing exclusively with impersonal categories of systems are easy to measure, the personal issues or soft elements of a system (sociological, behavioural and relational aspects) are somewhat not measureable in simple quantitative terms. Because of this shortcoming, whatever standards are assigned in attempting to measure them will remain subjective, relative and therefore highly prone to contestations. Elements of a system can be further dichotomised into either quantitative or qualitative. The critical issue is that a systems perspective sees education as a collection of institutional-business processes focused on achieving quality policy and quality objectives designed to meet customer requirements and needs.

4. MAKING A QUALITY MANAGEMENT SYSTEM SERVE EDUCATION

A meta-synthetic analysis of research in both the private and public sectors indicate that the generic focus of QMSs is on the planning, directing, organising, monitoring and controlling of the education provision system or processes. At the input stages, the focus is on the selection of input factors of the highest quality. At the throughput stages, the focus is on the correct matchand-mixes that will provide the highest quality processes aligned with producing the correct and accurate outputs and outcomes. The throughputs routes and their inherent transformative activities must show concerns on wastage, increasing business opportunities, effectiveness and efficiency. At the output stages, the focus is on outputting products and services that satisfy and delights the customer. A clear institutional paradigm on quality education should determine the quality of inputs selected and how they get transformed in ways that approximates hypothesised quality as close to perceived quality as possible. It is the author's view that the route to high quality education should be designed down from the institution's vision which must be explicitly clear on quality objectives and metrics. Subjecting educational outputs to the scrutiny and validation of the customers helps in setting and sharing meaning and standards against which to design a corpus of criteria for success. Modern industry-based QMSs like Six Sigma, Total Quality Management and quality function deployment among others have, since the 1980s, become widely used in education. The success of such adoptions depends partly on the ability of protagonists to make the focus of the QMS overlap with the focus of their education. Examining the alignment of the assumptions of a quality model with the key performance indicators in education would tell whether a model suits the expected array of results. The quality management model must embody the sub-systemic issues that matter to quality education. Thus, an encompassing QMS must be hinged on a system-based mental model in which individuals accept responsibility to learn with others and to partake in a shared vision about how to create, manage and deliver quality. Models previously used in education are now stunted as they focus on small-scale aspects of the education system: a. The four-level model and the goal-free evaluation model both focus on measurement. b. The behavioural objectives approach focus on results. c. The responsive evaluation model, the consumer-oriented

approach and the empowerment evaluation model focus on the customer. d. The organisational learning model focus on knowledge management while. e. The participatory/collaborative approach focus on partnerships. The author acknowledges that there is something of each model or approach in every other model but what matters is a clear mental model of how they integrate and sustain the effort for quality education. Because educational institutions are complex interactions of sub-systems, a model that improves a singular part of the entity will not accomplish the goal of overall institutional quality performance.

Management of educational assessment: meaning and implications

There is need for a focused strategic approach to choosing assessment methods and in implementing them. This is because the mix-and-match of assessment techniques should respond to the age, curriculum contexts and teacher qualities among other factors. The assessment methods need to be the most appropriate and be accurately operationalized. An array of assessment methods, exemplified below, can be used on the same students, same programme and within same or staggered periods. An educational institution's assessment methodology should encompass direct and indirect strategies, techniques, tools and instruments for the collection of information that strategists use to measure the level, scope and depth of learning experienced by the student. The concurrent use of multiple data gathering and processing techniques in assessment of teaching and learning improves the quality of information assessors will gather from the students and other sources. The triangulation approach strengthens the relevance, validity and reliability of strategies derived from such data. Among direct assessment methods are:

a. Capstone course (projects)
b. Certification exam
c. Comprehensive test
d. Embedded techniques
e. Entrance interviews, etc.

Among the indirect assessment methods are:

a. Focus group
b. Institutional data
c. Reflective student essays
d. SWOT analysis
e. Syllabus review
f. Surveys (course evaluation, graduate, alumni and employer).

Assessment that asks students to demonstrate (direct) is as critical as those asking them to reflect (indirect) on their learning.

5. MANAGEMENT OF QUALITY CONTROL AND QUALITY ASSURANCE INFRASTRUCTURE: MEANING AND IMPLICATIONS

Managing of the educational quality assurance infrastructure encompasses seeking the best fit among the various assessment methods and the rest of the activities that in their own ways determine quality of educational outputs and outcomes. Educational QA (quality assurance) has various activities, including assessments and quality controls (QCs) that are designed to track and resolve deficiencies, optimise inputs and processes to ensure that emergent customer needs and requirements are met continually. While QC (quality control) tends to focus on comparing inputs, throughputs and outputs against some scheme of criteria and specifications, quality assurance goes a little further in recognising that customer needs are complex, diverse and mobile [8]. Thus, in a fast-pacing world the need for focusing on quality assuring than QC is imperative. Because of globalisation, changes in resources types, processes and skillsets are giving rise to floods of styles and fashions. New Business Models have become more invasive in HEIs (higher education institutions) than in primary and secondary education institutions.

Management of resources/inputs: meaning and implications

The relation among inputs, processes and outcomes is not uncommon in educational management literature. The generic perception is that it is needful to ensure that the quality of inputs is as high as we would like the quality of outputs to be. Two assumptions come into play in this instance:

a. The quality or how well the processes will work out will be determined by the quality of the resources input into the transforming processes.

b. Assuming the input resources are favourable, the quality of outputs will be determined by the appropriateness and quality of the transforming operations.

But further to these assumptions is the need to ensure that the recruitment and selection of the inputs is subordinated to the framework of customer satisfaction performance. It basically means that the inputs and outlay of processes must be built from an analysis of the demands, needs and wants of the student, industry-commerce and society. A framework by which output requirements can inform input requirements through the Six Sigma Roadmap can be referred to as 'designing down'. Among the touted inputs are: a. Quality of teachers often defined by their level of certification rather than by their ability to make their students acquire and perform particular skills; b. Quality of the buildings often rated by the imagery in them than their appropriateness as facilitators to a process of learning and transformation and c. Quality of students often perceived through lenses of some assessment system that is little aligned to what the student will develop along the institutional experience. In essence the inputs in both quantity and quality must be derived from the 'voice of customer' and institutional vision on quality than anything else.

Management of educational processes: meaning and implications

Management of educational throughputs is a complex program because it calls for vertical alignment as well as horizontal integration of modes of thinking as of action. There is need to link the Strategy Plan from top-level goals to shop-flow operations and across the sectors and departments of the institution. It is therefore of paramount importance that strategists, managers and those at the operational-technical level appreciate the criticality of connecting every micro-activity with the bigger (macro-) picture of the institution. Linking the micro- to the macro- is a critical success factor in strategy implementation as it keeps every action looped with the strategy's objectives and goals. The positions of classroom practitioner, level head, head of department and upward have different job descriptions and assumed person competences that are, often in principle, 'proven' to facilitate good learning in the institution. These assumptions are combined to an array of standing and emergent policy regime that is meant to support or positively exploit the human skills. The delivery of high quality education may be constrained by inconsistencies in the policies and in their implementations.

Management of outputs: meaning and implications

'Management of outputs' may sound a rather inappropriate terminology for how the institution deals with the results of the learning-teaching processes. Educational outputs include the extant, the near and medium range results of an instructional experience. This includes the reflections undertaken by the teacher after encounters with the students and these focus on the reactions and responses of the learners. There is a need to differentiate educational outputs from educational outcomes. Educational outputs are more of the immediate and fairly near-term results of the education delivery system. Outcomes of an educational system and experience are rather difficult to winnow and claim in an exclusive fashion. Outcomes are a much delayed feature and their manifestation embodies the influence of other learning from society and the environment that the individual brushed with since the last instructional relationship. Outcomes reflect the deeper learning that resulted in the transformation of behaviour. It is important that the institutional process in the classroom does not limit itself to impacting content. It must as well focus on developing critical thinking skills, systems thinking and personal mastery. This transformative approach has implications on subject didactics and school pedagogy [9]. The next section compares six quality management models, evaluating their biases and thus, assesses their capability of improving quality of educational delivery.

6. CONCLUSION

Understanding each component of a QMS in its individuality should help in building a coherent picture of how a QMS can be at the service of a student-focused and market-oriented education delivery system. However, efforts to build an infrastructure for quality management and quality assurance are often constrained by the apparent inability of the stakeholders to share at least a near-common vision of how to do 'quality' in education. One way forward would be starting at the level of personal mastery and change the deep-sited attitudes and developing skills in strategic thinking so that the cause for team learning and reconfiguring our mental models becomes more urgent. The chapter worked on seven quality management models showing how they converge on nine categories. For effectiveness, these categories must be implemented in the framework of the 14 BPPs discussed herein. Important

would be for the institution to create strategic capabilities in each category and thereon has roadmaps for continual skills updating as the institution co-adapts with changing customer needs and wants. Profound co-adaptive change calls for consistent changes in strategic focus, set of key performance indicators, behaviour change indicators and the institution's bundle of critical success factors.

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