

Excellence in Technical Education: The Pathway of Quality Management

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Abstract

Education and especially technical education is recognized as a builder of both society and the nation. However, the precondition that it is fit in all respects must have been satisfied. The haziness in the definition of quality and hence 'the fitness' notwithstanding, requirements and expectations have been rightly raised to so called 'excellence' in education. The present work seeks to map the roadmap of improvement of (technical) education towards excellence, using quality, and/or quality management as the stimulus. By underpinning the triad model of Juran, the development of a case of quality utilizes the Joiner's model to achieve total quality improvement. This may not have excluded the paradigm of TQM in (technical) education, and rather considers it as a label or as an ardent part of the same package within the conceptual initiative. The modulation of requirements of quality management makes a case that the total quality improvement process accents on the various core activities associated with the knowledge transfer to students through an environment which sustains the proliferation of 'quality culture' and plethoric use of quality, its management, through the optimal use of the quality management standard. The quality of their exploration as core technology, use of quality management (standard) as a tool and pursuance of quality as advised by Juran's model and the institution's quality culture shall determine what level of excellence will be achieved.

Keywords: Quality assurance, TQM, quality management standard, Thareja's adaptation of Joiner's model, 4-A model, PDCA

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INTRODUCTION CHALLENGING SCENARIO OF EDUCATION

The sudden expansion in the growth of engineering institutions, backed by rapid strides of especially ICT technology related employment spread world over, gave a big push to engineering profession. A plethoric expansion consequently threatened the standards and quality of technical education, which was severed by the unavailability of required infrastructure and trained faculty [1]. At times, this poor-quality perception of students adversely affected academic atmospheres in the institution. Albeit low quality and employability pressurized closure of the non-conforming institutes, the latter did resort to 'quality management' as a market demands. Like a drowning man catches at a straw, 'Quality' brings a hope of life. It is because improving quality of education itself offers exceptional benefits to the society. The contribution of 'Management' in 'quality management' still remains elusive.

Investments made to improve education quality promise various direct and indirect economic benefits in much the same way as an investment in modernization by an industry would do. These both additionally promise better 'conformance to stated and implied outcomes', which all in turn improve capability to qualify for better quality ratings that will enhance its profits, productivity, and employability, as advised by Deming's chain reaction [2]. High quality of education equips learners with a diverse set of knowledge and skills that are relevant to the nation on one hand, and to attain levels of international recognition and reputation on the other. Such is the global perception of educational performance.

In order to ensure the quality of technical education, All India Council for Technical Education (AICTE) has established the National Board of Accreditation (NBA) to formulate the criteria or standards, by which individual programs in any engineering

institution can be evaluated [3]. Secondly, the international trends at Europe (Bologna) and Washington accord both called for avenues to make education standards comparable across the world, the former wanting to ensure value for money to woo students from across the world. NBA strives “to promote and recognize excellence in technical education” as she perceives “benefits from the process of continuous quality improvement that is encouraged by the NBA’s developmental approach (is designed) to promote excellence in technical education” [4]. Yet, a ‘Higher Education in India: Vision 2030’ slaps “We are in the 21st century with a mid-20th century regulatory architecture” [5].

Even on the process front, our insufficiencies become descript when our curriculum appears as being out of tune from various industrial practices and requirements. The change from industrial to knowledge economy is increasing such dichotomies where finding of optimal solutions may have been slower than the developments. In a market where the quantity and quality of learning is central, with the accompanying concern that traditional educational approaches are insufficient, makes a call for a suitable approach to ‘responsible action’ to control the change [6].

Cheng identifies three aspects of change that seems to apply real pressure on educational systems [7]. These are: (a) the growth of student numbers which required a quantum leap in education capacity; (b) the widespread, real revolution in informatics and communication technology, that should have profound effects on the way education need be reconceptualized; and, accompanying this phenomenon, is (c) the virtual explosion of available information to the average person so that the learner is no longer in a desert. Thus he believes future educational reforms will be driven by the notion of world-class education movements [8]. Given “Where quality management has been applied to education, it has made a huge difference” [9]. There arises a need to evaluate as to which is the real pathway for improving the quality of education to excellence [10]. The various pressures and promises are not likely to bring respite, but assuredly a systematized and well researched mechanism will. The other option

to improve bottom line, sustainability, and seeking of various financial supports from governments and/or elsewhere are drivers for such an initiative.

IMPERATIVES OF IMPROVING QUALITY TO LEVEL OF EXCELLENCE

Whereas the various initiatives viz. advancements in technology, the enabling of superior provisions (modern equipments) for the future classrooms [11], the innovations that attempt to improve environment in institutions, albeit superficially, all have boomed expectations of stakeholders of education, the root causes of dissatisfaction sustain [1]. The several industrial successes have proved that ‘Quality’ paradigm helps to swim out of both problems from root cause itself and also customer dissatisfaction. Rightly so, as quality is defined as consistently meeting customer’s needs and expectations, conformity to expectations (Zeithaml) and a journey to excellence, its use in academics is the hope for putting all above said implications to derive potential advantages through effective deployment [12–14].

While quality was defined by Juran as fitness for use, for education ball perceived it as fitness for purpose [15]. This definition embraces fitness towards effectiveness in achieving institutional goals, meeting aspirations of customers respond towards the degree to which education prepares students to be personally effective and capable within the circumstances of their life and work. On the other hand, the concept of total quality management (TQM) avoids the direct definition of quality; its focal emphasis is client satisfaction and continuous improvement.

Cheng cautions that improvement in some parts of management process is not sufficient to achieve excellence or total quality performance, and calls for a holistic (termed Triplized Learning) approach for future [8], and concurs OECD “education has been reformed and reformed again in most OECD countries, leading many to wonder whether we need new ways to influence the very interface of learning and teaching?” [6]. Thus the sense

of reaching the limits of educational reform invites a fresh focus on learning itself. Consequently, enhanced attention on learning with greater focus on measuring learning outcomes is rendered futile as the diagnosing of achievement levels and shortcomings asymptote. OECD laments “far too much research on learning is disconnected from the realities of educational practice and policy making”.

On the ground, learning cannot happen without adequate student engagement, slaps a survey based on teacher opinions organized by Pearson India [16]. The teachers (29%) felt that notwithstanding in the spate of technology boom the excessive use of personal gadgets by students and lack of parental support (12%) deterred the student from active engagement in learning which on the average has declined to 55%. In higher education, it is merely 50%. Such is the global trend and reality of education system worldwide [17]. Increasing use of internet, social media, and technology addictions of students are troubling and may be hurting them, the higher education in general, and their chances of getting jobs after graduation. Regardless of the reason, the fact remains that any student not fully present in their classes is missing out on the full value of their education [11, 18]. OECD endorses “the rapid developments and ubiquity of ICT are re-setting the boundaries of educational possibilities [6]. Yet, (while) significant investments in digital resources have not revolutionized learning environments; to (investigate) how they might require attention to the nature of learning (will be worthwhile)”.

When ‘Aspiring Minds’, a New Delhi-based employment solutions company stipulates: of 150,000 engineering students, barely 7% students were found suitable for core engineering jobs; which for software based jobs reduces to 3% [19]. It is because 70% of engineering colleges in India are providing poor-quality education which has led to reduced interest in the subject, views Raju Davis Parepadan, chairman of Kerala-based Holygrace Academy [20]. Thus both the quality of education and employability, have suffered. Pre-empting the gap, Gosling explains: “While a greater numbers of students

now arrive in higher education with excellent IT skills which can sometimes outstrip those of their tutors, a substantial number do not have these skills or the level of confidence in using IT that their course demands” [21]. This informs of Juran’s ‘fitness to use’, the lack of which denies employment [22]. The meeting of gap between the needs/requirement and the on-the-ground presentation is seen as what that should comply with ‘fitness to purpose’. An apt exploration is attempted between the two in author’s another work [23].

This level of un-employability is likely to cause serious instability in the economic and social conditions in the country, along with wide scale dissatisfaction and disillusionment in the society including students. It endorses that the lack of quality education persists, caused by profit-hungry managements, resplendent corruption, and shortage of faculty (both in quantity and quality). Major issues plaguing higher education include lack of skill education, focus on rote-learning methods, and poor awareness of quality philosophy and quality management concerns.

The various issues on educational practice as above indicate that there is a dire need to reengineer the quality of engineering education.

The need for improving the quality not only becomes more crucial and critical for survival amongst institutes as a compulsion, but it also spells a need to deploy the above said provisions rightly quality wise, viz. the provision of split air conditioners in class rooms tends to put learning ability to sleep because of increasing CO₂ levels [24]. This example is only cited as a pointer to assert that quality initiatives provided can never really be useful unless there is a robust ‘quality management’ programme at its back. As an advisory, the universities must accept the challenge of developing quality in their operations in order to be able to accomplish these actions [25].

LADDER OF QUALITY AND ‘QUALITY MANAGEMENT’ TO EXCELLENCE

Excellence evokes a number of positive and sometimes negative emotions [26]. Keeping

this aspect in view, we attempt to understand quality downwards from the perspective of excellence. Though in the last 30 years the two concepts have been at center stage of the transformation of higher education, meaning high academic standards; with both excellence and its close kin, quality, have changed meaning and content [27]., for e.g. in the 1980's and 1990's, emphasis was placed on high quality inputs and producing "excellent" outcomes [28]. Khandwalla states that organizations are deemed excellent because of their uniqueness, their pioneering spirit and innovation [29]. Lahiri states that excellence means introduction and implementation of creative and novel methods of curriculum planning, design and implementation, teaching learning methods, assessment techniques, management etc. [30]. In short, launching of the innovation programmes everywhere. Freed argues "striving for high quality is not a new strategy [31]. Institutions have always held academic excellence and high quality as the highest goals". Earlier both referred to individual (outstanding) quality or a virtue respectively; today they have increasingly come to refer to two different organizational characteristics. Excellence is getting institutionalized and 'quality' alludes to quality assurance whereby a minimum quality standard is required for a higher education institution to be officially licensed to operate. Summing up, despite the potentially contested

nature of such concepts, weight is given to criteria by the use of 'qualifiers' such as 'excellence', 'outstanding', 'distinguished' and respected [32].

Rostan and Vaira posit "Excellence is the new vocabulary and rhetoric embodied by institutions to present and represent themselves in the global competitive arena" [33]. The more the vocabulary and the rhetoric of excellence are enacted by political and university actors, the more it becomes legitimated, the more it gets institutionalized. Institutionalization is defined not as a state reached by a socially constructed 'object', but as a process by which such an 'object' gains a growing degree of legitimation and taken-for-grantedness given to it by social actors [34]. The process part is in agreement with how Aristotle perceives it: "Excellence is an art won by training and habituation. ... We are what we repeatedly do. Excellence, then, is not an act but a habit". If we add to this: "Quality is never an accident. It is always the result of intelligent effort." Achieving excellence would require more than an intelligent concerted effort with due synergies in hard aspects of competence, quality management tools, and a culture towards pursuance of the soft side of human evolution. This is schematically illustrated in Figure 1.

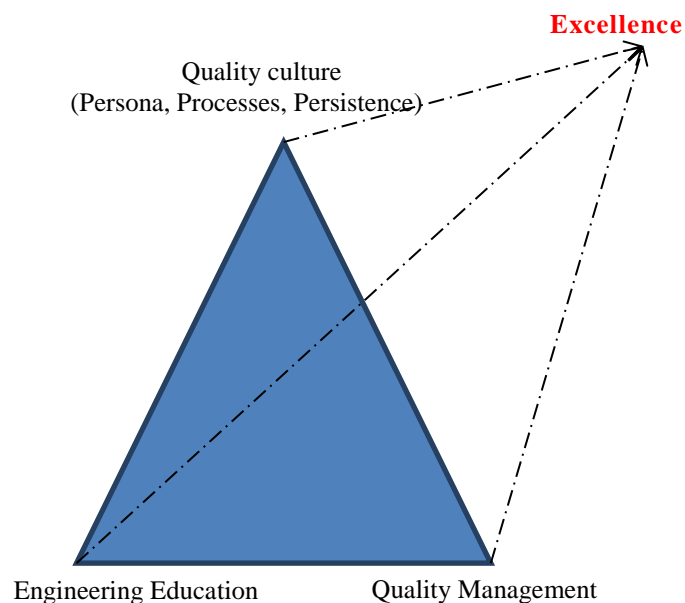


Fig. 1: The Constructs of 'Quality Education' for Excellence as per Joiner's Paradigm.

The soft side requirements were duly accented by Henry Ford, who envisaged the dependency of efficiency and effectiveness of the man-machine management system on the work culture of people comprising the organization. The larger role of people there has been analyzed in author's dedicated series on 'total quality organization thru' people, from part 1 through part 51 [35]. On the other side, people aspect is much stronger in 'education' than that of the 'industry'. Moreover the quality of former has a large impact on the quality of latter, as Bhaduiy posits supporting development of a positive work culture, concluding it as "the most vital issue which must be tackled if the Indian organized sector wants to reverse the current trend of erosion of productivity, lack of innovativeness and the rising cost of end products" [36]. It is also obvious that human side has the cultural endowment vis-à-vis the man-machine system.

Across any academic institution, excellence imbibes the perception of student experience, society's productivity, suitability to employers, integrated across the varying missions of an institution in making. They together create a culture for academic excellence [37], provided quality principles are rigorously followed. It is also because quality management facilitates a connection between outcomes and the process by which outcomes are achieved [38]. It thus functions as an ideal systemic process for managing change and thereby improving education [39, 40].

In essence, quality management is the act of overseeing all activities and tasks needed to maintain a desired level of excellence [41]. It is a discipline that ensures outputs, benefits, and the processes by which they are delivered, meet stakeholder requirements and are fit for purpose [42]. The management here is the attribute that qualifies the determination of a quality policy, creating and implementing quality planning and assurance, for meeting desired objectives followed by due quality control for consistency and further ongoing quality improvement. On the other hand, ongoing improvements go missing with higher dependence of quality assurance, which leads to status quo. With good quality assurance

results, Jeliaskova and Westerheijden find out that well rated programmes felt no impulse for change [43]. The stance of slower teacher innovation and lower impetus for improvement is explained as "the Peter Pan effect": while the use of student feedback depends on the lecturers' perception of their process reliability and validity, teachers may not believe in quality assurance to allow latter to work.

Quality assurance task force stipulates that quality is operationalized in several ways including: (a) fitness for purpose (mission), (b) exceptional, and (c) value-added. This pathway sets in the mood for due institutionalization for excellence [44].

In fact, the term quality itself demands performance standards, which have over time lagged vis-à-vis excellence. Rostan and Vaira maintain that conscientious deployment of quality principles serve to create a culture for academic excellence. Since understanding of quality is hazy, its notion of quality remains vague and unshared internally [45]. A better approach is to first explore the kind of education students should possess upon graduation, for which, understanding it better is imperative. We review in Table 1 the various stipulations of quality in the two scenarios of business and higher education, with cognizance to the section served by respective scenario.

The extrapolations in defining quality will continue unabated till a universally acceptable definition emerges. However, it is pertinent to mention how and how well these were initially grounded by the two quality gurus Juran and Deming. Deming provided a systematic view of the organizational upliftment, while Juran prescribed an analytical approach to managing for quality. Through the triad of quality planning, quality control, and quality improvement Juran advised a management practice that will foster improvements. Deming's compliment of PDCA (Plan, Do, Check and Act) and Juran's two latter stages namely control and improve are more apt vis-à-vis Deming's check and act.

Table 1: Definitions of Quality in Business and Higher Education [46].

Business		Education		
Definition		Definition		Stakeholders
Transcendent	Quality results from producer’s expertise	Exceptional Harvey and Knight (1996)	Quality results from expertise of professoriate	Faculty
Manufacturing	Product conforms to specifications	Fitness for Purpose (mission)	Institution is capable of based	External stakeholders
	Fitness for purpose		Meeting educational aims and objectives	Accreditation agencies
Product-based	Quality is determined by the presence or absence of an ingredient	Transformative Value-added Bogue (1998)	Linked to assessment; evidence of quality is increased student learning	Accreditation agencies employers
Value-based	Acceptable performance at an acceptable price	Value for money	External rankings, such as Macleans Resource orientation	Administrators, parents, students
User-based	Quality defined by consumers’ needs and preferences	Fitness for purpose (customer specification)	Outcomes meet specified requirements	Students, government (depending on who is identified as the “customer”)
		Quality as perfection or consistency Harvey and Knight (1996)		
		Limited supply		
Results		quality in results, Astin (1985)		

SYSTEM APPROACH TO QUALITY MANAGEMENT IS TOTAL

The definition of quality management as above saw it as ‘the act of overseeing all activities and tasks needed to maintain a desired level of excellence’, and the system definition sees all-encompassing activities and tasks (processes, along with inputs, resources) aligned around the quality requirements in an integrated way. Essentially, such network of ‘interdependent components, working together to try to accomplish the aim of the system’, implies their components and interdependencies must be ‘understood and managed as a system’ and directed at a well-articulated aim, in case of desired situation [47]. To bring about effective change in education, the system of ‘quality’ must be managed, strategically managing the individual quality of each of the component of the system. This requirement is complicated and needs a rigorous management of activities of the

system. To begin with, in case of the educational setting, it must entail a detailed ‘Articulation’ of the quality requirements of each component of system. While articulation is progressed, the practitioner must maintain due ‘Alignment’ towards objective. Post articulation, it is time for detailed ‘Analysis’ of the functions for ascertainment of adequacies, and finally ‘Actions’ as per the prescription of quality management. These 4-A’s must work in an integrated way, as schematically illustrated (Figure 2).

This 4-A paradigm conforms to the popular (i) Deming’s PDSA (Plan, Do, study and Act) approach essentially for the industry, if and when applied to the defining of quality as a system. The articulation needs to incorporate (ii) the erstwhile eight quality management principles (now seven QMPs), appropriately modified in 2015 concurrently with revision of ISO 9000:2015 series of quality management system standards [48].



Fig. 2: The Thareja's 4- 'A' Paradigm for 'Quality Education' for Excellence as a Compliment of Deming's PDSA Paradigm.

Application of quality management to education is tougher because 'hundreds, if not thousands, of variables influence the educational processes and ultimately the achievement of students'. This is though in line with Senge's stipulation that "business (read education –because today it assumes the characteristics of business and other human endeavors are systems, they too are bound by invisible fabrics of interrelated actions), which often take years to fully play out their effects on each other", say, despite the 4 year undergraduate programme in engineering interpolates to the quality attributes of the engineering student (alignment/knowledge foundation acquired in K1 to X+2), the results would only be validated after many years of graduation which may endorse adequate lifelong learning and deployment of the prescribed skills which is complex [49].

While viewing a school as system of systems, the complexities further arise because of (i) the difficulty to define the student, who is a raw material being processed towards graduation (e.g. in engineering (say Civil Engineering), an operator who takes charge of assimilation of learning inputs into her knowledge inventory, or meta-learning or qualte-k-nology (quality, technology, knowledge with the science of learning), a customer, a consumer, and also a product (service) whose competencies are available for deployment at a price (employability).

Morris adds that the complexity in education is due to the persistence of mental models and possibly their interventions through the larger prescribes of the system [50]. Doyle posits "a systems perspective that changes the mental models" that enabled and empowered school district personnel to follow a systemic and systematic change strategy based on quality principles and to seek and institute solutions that were outside the bounds of the institutional cultural framework of "education as usual" are two complex paradigms that further complicate the 4-A system as discussed in the beginning of this section. These articulation, alignment, analysis, and actions may be regressed in many ways as that of PDSA or PDCA.

One may deduce from the above analysis that a system approach to quality management leaves nothing out of its gambit which could have been a part of the TQM (total quality management) frame. The 'total' implies organization wide, impacting all activities, processes, people and so on, for e.g. 'total' includes the management of all the elements of an organization processes, practices, systems, methodologies and of all those who are involved or damage in any way the quality of product or service [51]. The process of achieving agreed requirements by increasing quality at the lowest effective cost utilizing every resource optimally is every body's responsibility which involve parents, students, faculty, the top management, supporting and administrative staff in all the activities.

However, previous studies report mixed and ambiguous results of the relationship between TQM practices and performances, Sousa and Vossclout TQM principles are not universally applicable across all contexts but are contingent on contextual factors [52, 53]. However, Murad and Rajesh perceive that TQM is a general management philosophy and a blend of various tools which induce educational institutions to pursue a description of quality and the means to achieving to which peak adds specifics, viz.: (i) improving education process, (ii) making the educational environment motivating, (iii) improving educational curriculum, (iv) boosting the speed of training services, and (v) reducing

costs. TQM reduces callousness, improves harmony, efficiency and efficacy, and improves transparency and predictability [54–56]. TQM has the capacity to improve strategic quality planning which includes vision, mission, and values of the firms, and founded by taking into account the quality concept [51]. As principles like continuous improvement, open communication, fact-based problem solving and decision making, etc. are pinned with TQM; academic institutions should adopt a more customer oriented approach in dealing with their student [57]. However, it is contested that “most of the decisions in the organizations are made without the awareness of the operative work culture that leads to the unanticipated and undesirable consequences within and outside the organizational boundaries” [58].

Though TQM is deployed to provide practical solutions, these are more often grounded in the organizational culture for quality. So prescribes Deming, “TQM is a management philosophy that requires a radical cultural change from traditional management to continuous improvement management style in an organization” [2, 7]. As quips Dalota, TQM is all about fostering a culture that is continuously (improvement) oriented towards increasing customer satisfaction while minimizing the real cost of production (read activities)”. For the latter parts, Sirvanci recommends the use of quality function deployment (QFD) to incorporate the preference of customers and other stakeholders in program design [59]. Saleh *et al.* add, these tools and techniques are subject to fine tuning while applying in education [57].

The paradigm of fine tuning is integrated in the system standard in clause 10.3 (continual improvement, earlier 8.5.1 in 2008 version) of ISO 9000:2015 QMS standard, wherein it is built in as an objective [60]. The mechanism is illustrated as a normal cultural phenomenon replicated from nature (with an exemplar of Mount Everest, the highest peak) in an earlier work of principal author [61].

In order to see how the theme of ‘Quality’ and its constituents (QM or TQM) and the ‘tools and techniques’ (like Quality Management

System standard, QFD) overall contribute towards excellence, we take cognizance of B.L. Joiner’s (University of Wisconsin, USA) conceptual model who prescribes ‘Technology’, ‘Tools and Techniques’ and ‘Culture’ as the apexes of the triad, duly superimposed on the Juran’s triad of plan, control and improve. As clarifies the above discussion, TQM is greatly seen to serve in strategic planning, improvement and organizational culture. On the other hand, the tools like quality management system standard enable the quality assurance and control by way of assessments, both formative (internal audit) and summative (accreditation, excellence awards like EFQM) etc. The complex of triad as per framework conceptualized by Thareja, as shown in Figure 3, enjoins the Joiner’s constructs over the Juran’s elements of his triad [62].

We further attempt to supplant the Juran’s elements of analytical approach on B.L. Joiner’s (University of Wisconsin, USA) conceptual model to define quality in education setting and explore these further, duly guided by technology, tools and techniques and quality (motivation for quality management/culture); viz. the planning would entail in its technology part strategizing for improving the competence, which is more at the behest of teaching and learning. The principle author of this paper designed and ascertained daily lesson plans for the various teachers which were used for formative assessment of teaching plans. For the transformatory part of quality improvement, we exercised continual coaching of faculty and inculcated a culture for improving personal quality by facilitating indulgence in continual learning and of outreaching by participating in tutorial programmes. The other measure adopted of improving knowledge applications (writing technical papers) was, both a planned and improvement venture. The same exercise is assessed through the API score of the academe, and contributes towards that of the institute. Slowly the research and academic pursuits become a second nature of most academe, who has been sincere in these.

In nonprofessional’s language, the work culture is dependent on the thought process

and attitude of the employees, which further decides the ambience of the organization (Ideologies and principles of the organization) [63, 64]. Academically, since the foundation of any quality improvement is to develop a mindset which becomes "quality culture", the

quality of its alignment w.r.t the determinant or quality of purpose will actually determine the quality of output [65]. An interface of quality (with its various definitions) with culture is reproduced in Table 2 [66].

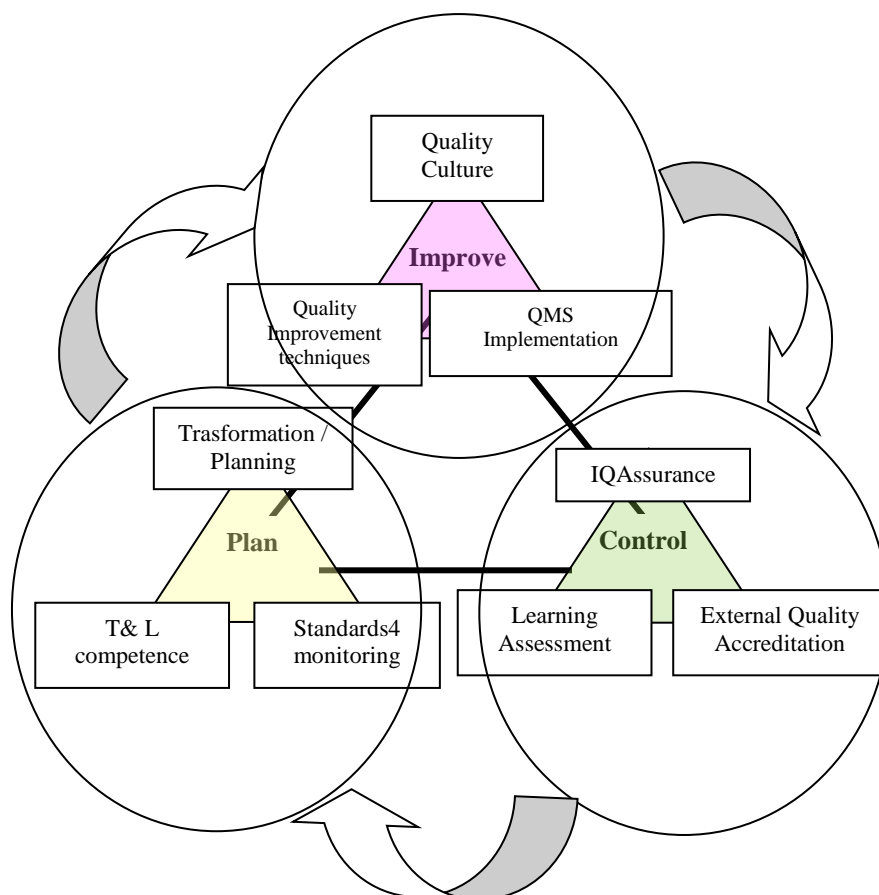


Fig. 3: The Juran's Elements of Triad-Plan, Control and Improve, Superimposed with their Explorations of 'Quality Education' as per Joiner's Paradigm (Guided by Thareja's Paradigm [62]).

Table 2: Harvey, L. and Stensaker, B. (2008), Intersection of Quality Definitions and Elite and Democratic Concepts of Culture [66].

Quality	Culture	
	Elitist	Democratic
Excellence	Creating an environment in which the best prosper irrespective of others	Developing a set of shared, lived understandings of how to project, support and aspire to excellence
Consistency	Making sure that areas of high reputation perform consistently	Everyone takes responsibility for ensuring their own work meets expectations and specifications.
Fitness for purpose [9]	Specifying an elitist purpose and ensuring everything conforms to it.	A common understanding of purpose and how to achieve it.
Value for money	Using reputational leverage to attract money from high profile resources and ensuring that it is spent effectively, or at least to the satisfaction of donors	Developing an internalized set of values that ensures resources are used efficiently and effectively
Transformational	Ensuring that top-graded students are prepared (enhanced and empowered) for significant graduate jobs and that top researchers are fully supported and enabled to attract and deliver major research projects	A stakeholder-centred approach that endeavours to enhance and empower students and researchers: prioritizing the development of participants in the learning and knowledge development process.

Harvey & Stensaker [66].

However, since culture needs to be understood more deeply, implementation of quality may not be without hiccups; given culture, “is one of the most complicated words in the English language” [67]. It is difficult to define and characterize. For instance, the rhetoric of “quality culture” in European higher education is often referred to as elements of its search for excellence, but the changes Europe should make to achieve this quality culture remain unclear; viz. the “Quality culture” project (2002–2006) of European Universities Association (EUA) stipulates that quality culture was based on two distinct elements [68]:

- (i) A set of shared values, beliefs, expectations and commitment towards quality; and
- (ii) A structural/managerial element (viz. implementation of QMS standard) with well-defined processes that enhance quality and coordinate efforts.

In order to promote the environment of these and honest disposition to quality management, the organization must offer a positive ambience to the employees (motivation for teachers and students) for them to concentrate on their work (teaching, learning and others). Given, all the employees (including students) of the organization strictly follow the organization’s rules and regulations, the organization is said to have a strong work culture [69]. Any inadvertent deviation or failure (say, because of environmental aberrations) may be construed as unsolicited part of culture.

Quality culture is reported to help identify challenges to become “reflective practitioners”, enabled by the requirements as per the inventory from Figure 4. Rather than first answering the question of their current identity, it calls for designing and using a systemic change process @ cultural alignment to present social structures or handling or quality assurance issues as the technology side of triad. The three apexes are shown in the top part of Figure 4.

Most of the decisions in the organizations are made without the awareness of the operative work culture that may lead to the unanticipated and undesirable consequences within and outside the organizational boundaries [70].

LEARNING OUR LESSONS

The generic system approach, which is essentially prescribed in input→ process→ output format, is quite akin to the planning (of inputs, processes, and all activities w.r.t outputs), their control and also for continual improvements. It is increasingly watched that the will to improve the quality of product is strong. But unless such an objective is system oriented, and orchestrates from the processes, the outcome will be only product friendly and not necessarily society friendly [71]. Cheng advocates that education should be adjusted (often strongly) to meet the changing needs of both individuals and the societies they live in taking education and educators out of the catch-up mode and placing them at the leading edge of the development process [8].

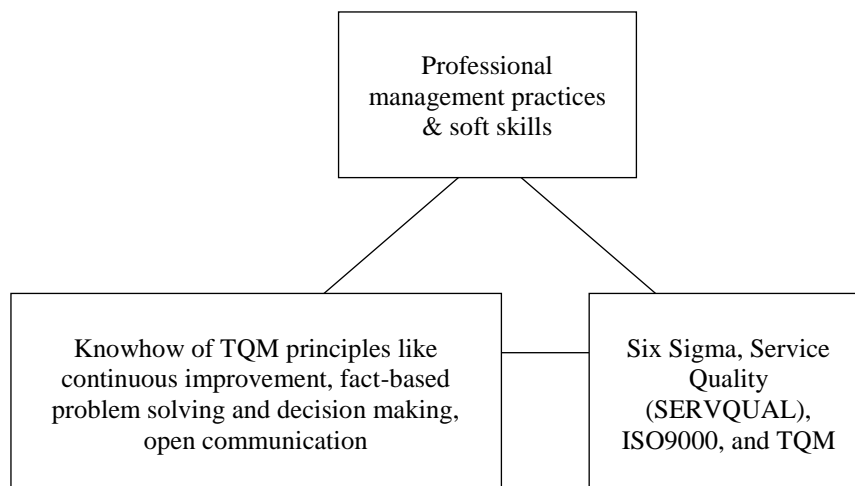


Fig. 4: The Tasks of ‘Quality Development’ (Soft Skills) as per Joiner’s Paradigm.

If effectiveness and improvement of education should be defined by world-class standards, then every event should be systematically graduated to such standards [5]. Use of quality management system per ISO 9000 series standard is the way out to plan, assure conformance and even examine the effectiveness of the system or individual processes. It shall even enable one to respond to change provided “if the organization has a plan to develop its approach to the management of quality on the principles of TQM”, state Wiele *et al.* [72]. However, speculate Senge *et al.* that schools that learn and improve are those that approach change from a systems perspective 2000 [73]. The more systemic the change, the more the school embodies change in behaviors, culture, and structure, and the more lasting the change will be. However, wherever designs for quality assurance processes get chosen without taking into consideration of the present social structures or adequate handling or quality assurance issues [74], right quality culture cannot be developed [69]. This is because “A quality culture is not something that can be constructed irrespective of the context in which it is located” [66]. Thus it forms an element of each university’s core identity [45].

A research at Republic of Croatia concluded: “To improve education quality... it is crucial to reduce the huge amount of knowledge students are supposed to master, focusing their attention to a system of basic knowledge, on creativity, problem-solving and lifelong

learning” [76]. The study had involved aspects viz. (i) education quality based on total quality management (Plan), (i) the assessment of quality w.r.t quality management standards for education (Control), and (iii) the relation between TQM and the efficiency of education (for Improvement). The results reported TQM facilitated:

- (a) That the institution successfully distributed their accumulated knowledge and increased their efficiency.
- (b) Achievement of the goals and tasks of education
- (c) Improved the quality of management

Their conclusions asserted the role of tools and techniques by way of implementation of ‘quality management’ paradigm whose use was justified in the institution’s integrated educational system.

Again in case of the planning part, the inputs, and processes are integrated and need to be aligned w.r.t the outputs, for which teaching and learning process, the planning for transformation and the planning (design) of quality manual including vision, mission and policies are prescribed. These three attributes are shown in the left side of Figure 3 (i.e. transforming planning, T & L Competence and Standards and Standards for monitoring). Evidently a major part of operation encompasses the teaching and learning process, though the emphasis needs to be on the latter, i.e. learning. This part is further explored in the Figure 5.

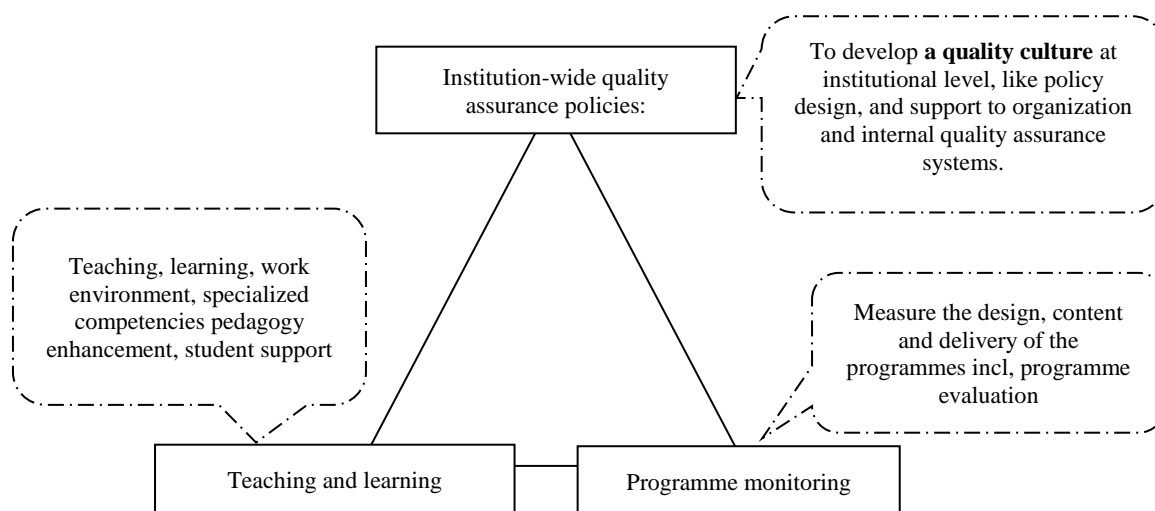


Fig. 5: The Tasks of ‘Quality Education’ (Teaching and Learning Process) as per Joiner’s Paradigm.

Table 3: Paradigm Shift in Learning [8].

Traditional Site-Bounded Paradigm	New Glocal (Triplization) Paradigm
Reproduced Learning	Individualized Learning
• Student is the follower of teacher	• Student is the centre of education
• Standard programs	• Individualized programs
• Absorbing knowledge from their teachers	• Self-learning with appropriate guidance and facilitation
• Receiving process	• Self-actualizing process
• Focus on how to gain	• Focus on how to learn
• External rewarding and punishment avoiding	• Self-rewarding and enjoyable
School-Bounded Learning	Localized and Globalized Learning
• Teacher-based learning	• Multiple local and global sources of learning
• Separated learning	• Networked learning
• Fixed period and within school	• Life-long and everywhere
• Limited opportunities	• Unlimited opportunities
• School bounded learning	• World-class learning
• School experiences	• Local and international outlook

It is implied that the operational part is more of student centred and the knowledge part towards optimal planning. Hénard recommends the support for quality teaching in the sample encompasses a wide range of initiatives that are grouped under three major headings [75]:

1. Institution-wide and quality assurance policies: including global projects designed to develop a quality culture at institutional level, like policy design, and support to organization and internal quality assurance systems.
2. Programme monitoring: including actions to measure the design, content and delivery of the programmes (through programme evaluation notably).
3. Teaching and learning support: including initiatives targeting the teachers (on the teaching side), the students (on the learning side) or both (e.g. on the work environment). Examples include continuing education for faculty, pedagogy enhancement, student support (e.g. mentoring and career advice), support for student learning (focused on inputs, such as the introduction of new pedagogical tools, or on outputs, such as the development of certain abilities for the students).

Cheng sketches the change the school system is likely to witness, incorporating a globalised and localized (glocalised) learning scenario using the individualized learning [7]. It is also

required that they deploy the glocal resources, support, and networks to create and materialize the opportunities for students' developments during their learning process. The perspective of such a change is visualized as tabulated as in Table 3.

CONCLUSIONS

The paradigm of achievement of excellence has been raised, based upon the Juran's trilogy of plan, control and environment, and as per the Joiner's diagram. It is implied that the quality of their exploration as core technology, use of quality management (standard) as a tool and pursuance of quality as advised by Juran's model and the institution's quality culture shall determine what level of excellence will be achieved. The elements of former have thus been explored further down in accordance with the mandates of latter. The final analysis asserts on the role of strategic planning, and of the quality management system whose design, awareness as an assessment tool and the hard and soft aspects of implementation.

To ease the understanding of the quality and culture, we have discussed their roles singularly and in integration with each other. Further the essence of 'quality culture' is raised, applied in the domain of education. Being an element of each university's core identity, the culture makes good of organizational values and the rightful application of policy design, and support to organization and internal quality assurance systems. Culture is reportedly handy

especially when the organizations chase zero defect or consistency/perfection as definition of quality. Thus the culture grounds strongly towards excellence.

The exercise of modulation of requirements of quality management advises that the total quality improvement process accents on the various core activities associated with the knowledge transfer to students through an environment which sustains the proliferation of 'quality culture' and plethoric use of quality, and its management, through the optimal use of the quality management standard [76].

On the whole, the application of quality management (with its conceptual synonyms of quality, quality assurance, quality management, and total quality management) has been considered towards execution of excellence in education.

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Cite this Article

Priyavrat Thareja. Excellence in Technical Education: The Pathway of Quality Management. *Omni Science: A Multi-disciplinary Journal*. 2017; 7(3): 7–22p.