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The Feasibility of Quality Function Deployment (QFD) as an Assessment and Quality Assurance Model

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Business schools are globally often seen as structured, purpose-driven, multi-sector and multi-perspective organisations. This article is based on the response of a graduate school to an innovative industrial Quality Function Deployment-based model (QFD), which was to be adopted initially in a Master's degree programme for quality assurance purposes. The approach is based on the premise that individuals ought to take responsibility for the quality of their own work. A structured qualitative case study approach was used with the deployment of one-on-one and focus group interviews, document analysis, and observations. Convenient sampling assisted in reaching 27 respondents (five from the Ministry of Higher and Tertiary Education, eight academics and university managers and 14 students and alumni), documents and facilities that had the most pertinent information on the research focus. A validation study was used to test the value of the research findings to business and the practice of quality assurance. The main findings of the study attest to the feasibility of QFD as an assessment and quality assurance tool in higher education, and as a compact and holistic model for quality assurance that subsumes the many fragmented models available. QFD appears to supersede most models, where it compounds the market, social and management dimensions in terms of quality. In addition, Six Sigma Road Mapping can be linked to QFD to balance the quality requirements in terms of planned quality, offered quality and expected quality.

Keywords: Customer Satisfaction Performance; Graduate School; Quality Function Deployment; Six Sigma Road Mapping; Six Sigma Roadmaps; Theory of Constraint; Voice of the Customer

Introduction

The broader literature is ambivalent regarding the performance of business/industrial-models that have been migrated into Higher Education (HE). Much of the research on business models has focused on separate elements rather than the models in their entirety. Reports gathered from these, whether they fail or succeed, mislead research, policy and practice. Ahmed (2006) and Al-Kassem, In'airat and Al Bakri (2013) explain that in a quixotic sense, a claim regarding the use of a model should be made only when the model is adopted in its entirety. What the international Education fraternity should await is research on the use of these models in teaching and learning. This does not only apply to the global and international landscapes, but also to Southern African curriculum developers and programme evaluators, as the majority of practitioners still rely heavily on traditional programme evaluation practices (see Carl, 2009). The proposed QFD explored in the article, is a valuable strategy by means of which to align business, industry and education, and has the potential to bring novelty and innovation to our existing curriculum and programme evaluation approaches. The true value of QFD stretches beyond the boundaries of developing countries, and brings new insight to scenarios where quality management has become synonymous with industrial benchmarks, quality and standards. However, Haggis (2009) laments the fact that research in HE lags behind industrial research by decades. It therefore appears as if models of quality assurance at institutional level might not have been sufficiently addressed in the literature in the past. Furthermore, research theory analysts like Jackson and Mazzei (2012) complain that much theory that has guided research in organisations has been argued and developed by theorists who have, themselves, not tested their arguments empirically. The implication then is that our current international and national perspectives on the links among HE, the models, and research are, at the very least, unstable.

In 2005, the Chinhoyi University of Technology Graduate Business School, hereafter referred to as CUTGBS, adopted a QFD-based model in the hope that this would improve its competitiveness in a market increasingly characterised by massification (Altbach, 2002; Altbach & Salmi, 2011:12; Brittingham, 2009:7; Salmi, 2011; Shah, 2013:359; Stensaker & Harvey, 2011); marketisation (Bolland & Fowler, 2000; Considine & Painter, 1997:5-6; Gopinathan & Lee, 2011:287; Susanti, 2011:209; Szekeres, 2004); commoditisation (Clark, 2011:1; Deem, 2001; Dixon, 2006; Mok & Cheng, 2011:231); globalisation (Altbach & Knight, 2007:291); diversification (Coaldrake, 1998:1), and increasing stakeholder activism and stakeholder quality literacy in driving changes in HE (Santiago, Tremblay, Basri & Arnal, 2008:3-4). With this said, we present the overarching research problem and contextualise the research questions.

Research Problem and Supporting Rationale

The introduction above has highlighted the contextual sense of the research problem. In terms of its 'action sense', the goal of this research is to contribute to our appreciation of quality and quality assurance, and to the growing but still limited understanding of the adoption and implementation of New Public Management (business) models such as QFD and 'Six Sigma' to HE. This is done by examining how the CUTGBS adopted and diffused the various stages and tools of QFD, and its implication on the quality of a Masters of Science

(MSc) Programme. To transform current theory and data, and to keep meaning in motion in what Jackson and Mazzei (2012) call the 'threshold' of business models' adoption in the services sector, we crafted a set of analytical research sub-questions. This approach helped the study to stretch meaning beyond the pedestrian sense. Thus, a better understanding of programme quality management in terms of Quality Function Deployment (QFD) and market-orientation should create a new dimension of quality management in HE.

Questions that Steered the Study

To make data collection more manageable and easy to analyse, the research question 'how was quality function deployment managed in the masters programme?' was disaggregated into the following six research sub-questions: (a) What is the nature of QFD?; (b) What strategic planning issues motivated the choice and adoption of QFD in the CUTGBS?; (c) How did staff respond to the QFD model and its institutionalisation in the CUTGBS?; (d) How effective was the implementation of the QFD tools in the MSc Programme?; (e) What were the perceptions of staff to both internal and external quality assurance interventions?; and (f) How did management respond to the results of the implementation of QFD?

Theoretic Perspective and Conceptual Framework that Underpinned the Study

In essence, the research project falls within the realm of qualitative organisational research of the case study type. We see an organisation as a soft system, of dynamic relations among multiple unequal sectors who seek their diverse objectives, which derive and ought to feed back into the organisational goal. We relate these issues in Figure 1, which is an original construction based on the synthesis of literature on organisational psychology and behaviour.

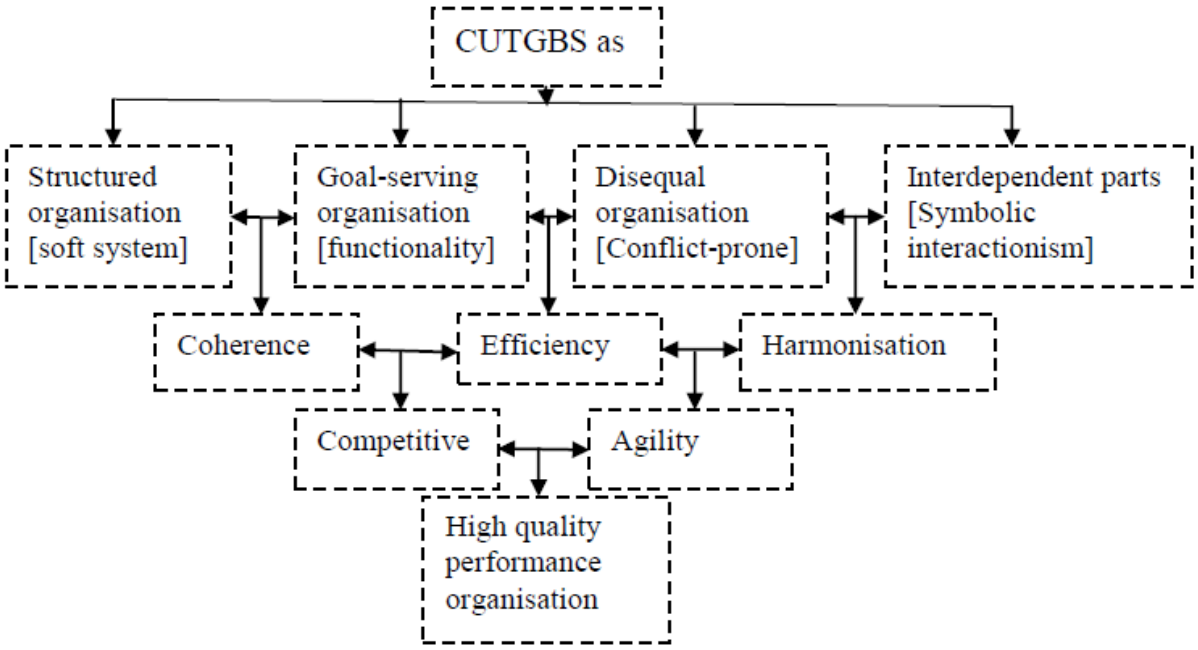

Figure 1 Theoretical perspective serving the research

Each organisation is structured in its own way. An organisation's structural configuration can enhance or constrain it in its pursuit to meet organisational and social expectations (Jones, 2014). A business school may be considered to be internally coherent when its structure and operational capability help it to be economically and financially viable and to meet educational quality expectations of students, society and industry. On the other hand, the expectations of constituencies may persuade or pressure business schools to adopt particular models, structures and management styles. Sizeable business schools are likely to be layered (top, middle, operational levels), and horizontally divided into departments or roles and have a multitude of external stakeholder groups. If these layers and sectors are not sufficiently well-managed as a coherent entity, the organisation may degenerate into dysfunction due to competitive, fragmented and reactive behaviours as each sector tries to outsmart every other constituency. Without vertical and horizontal harmonisation of structures, processes and interfaces business schools can lose their structural, market and cultural agility as well as their competitiveness. High quality performance business schools are boundary-less, soft systems,

whose organisational goal infrastructure aligns with the objectives network of the numerous levels, sectors and jobs.

Six Sigma and QFD methodologies consider take the lack of coherence, efficiency and harmonisation as constraints, sources of defects or performance risks and subject them to tools of analysis like the Failure Mode Evaluation and Analysis. Six Sigma can be used within QFD to integrate Voice of Business, Voice of Market, Voice of Customer and Voice of Technology in detailing (design, processes, technology-use and marketing) Six Sigma Roadmaps in ways that achieve greater idiosyncratic and strategic bundling among all stakeholders of HE (see Figure 3). Revere and Black (2003:377) are more specific about this when they write that this so-called 'Six Sigma' should be regarded as a "new management philosophy" that "seeks a non-existent error rate". Six Sigma was introduced by Motorola and General Electric (GE) in the 1980s to improve quality in-house. Today it is generally viewed as a system of quality standards/metrics, quality assurance methodology and as a business initiative (Hoerl, 1998:40). Its main purpose is to evaluate the capacity of an organisation or given processes to perform 'defect free', and 'a defect' is seen here as 'anything that results in customer dissatisfaction' (Kwak & Anbari, 2006:708; Revere & Black, 2003:379). Klefsjö, Wiklund and Edgeman (2001:32) write that "…sigma [sic] is a measure of process variation referred to as the standard deviation and 'six sigma' [sic] generally implies occurrence of defects at a rate of 3.4 defects per million". Revere and Black (2003:378) claim that Six Sigma makes Total Quality Management (TQM) more successful by improving organisational focus on the critical strands of its Strategy plan. When discussing Figure 2, it becomes possible to appreciate how QFD and Six Sigma create a conceptual framework, and the methodological guide for enhancing assessment and quality assurance in a business school and a program in particular. We designed Figure 2 from fragments drawn from the literature and drew it into the research.

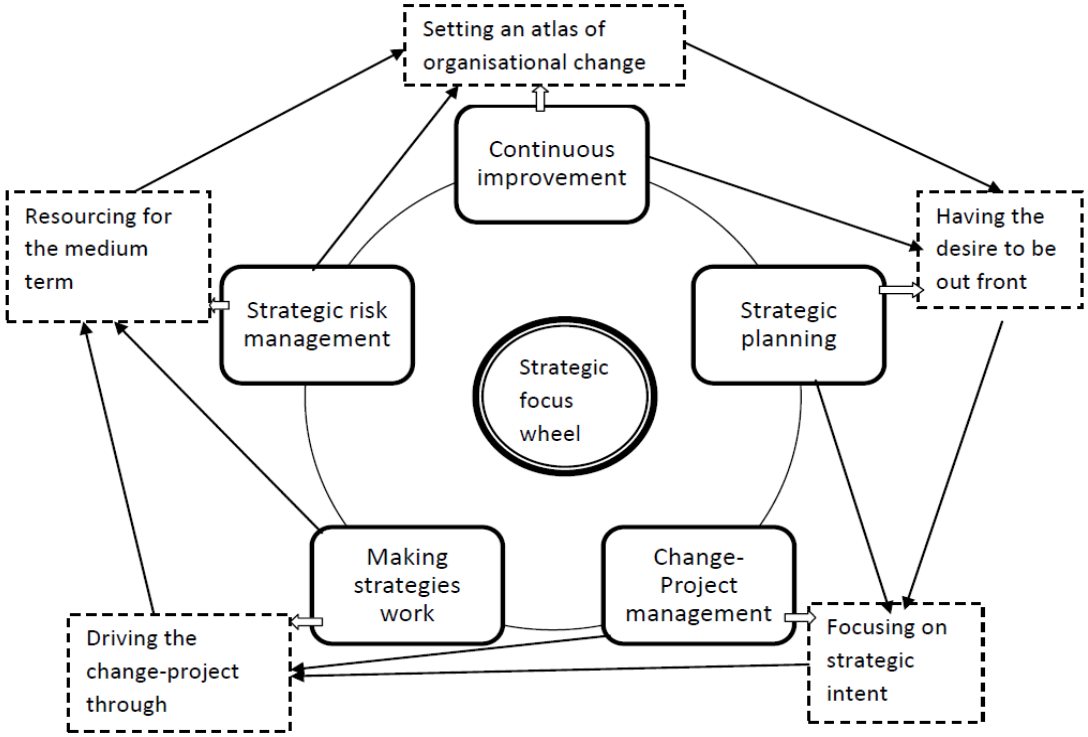

Figure 2 Conceptual framework for the study

Application of Senge, Cambron-McCabe, Lucas, Smith, Dutton and Kleiner's (2012) five disciplines of 'systems thinking', 'shared vision', 'team learning', 'personal mastery', and 'mental model' would help organisations in applying QFD and Six Sigma to perfect each strand of the Strategy Focus Wheel. Setting the infrastructure for continuous improvement in HE requires some level of redesigning and rethinking of the conceptual and pragmatic meaning and implications on assessment and quality assurance across the organisation.

Continuous improvement implies mapping an 'atlas of change', in some cases quite profoundly. With traditional models, continuous improvement is about 'doing the same thing, better', where in TQM, it involves refocusing towards customer expectations. In QFD and Six Sigma, it involves aligning offered quality with

expected quality, without failure. QFD and Six Sigma provide the metrics, methodology and the motivation (Chang, 2006; Ficalora & Cohen, 2009) for working away any defects in structures, functions, processes and their interfaces, of which there exist so many in HEIs, as well as any master's programme (Ramírez, 2013; Ramírez & Berger, 2014). A desire for continuous improvement must be hinged on a strategic plan, lest people forget the mission, lose sight on strategic intent and let things fall apart.

Strategic planning involves identification of strategic issues, such as the 'why', 'what' and 'how' of assessment and quality assurance in HE. Apparently, there is much talk and appreciation of 'why' quality is needed, but less so of 'what' actually is that we mean by quality and little of 'how' we ought to make high quality education happen. The Best Practice Principles (BPPs) that facilitate this strand of the Strategy Focus Wheel are: (a) ensure integration of effort; (b) being disciplined; (c) create customer value; (d) being time-based; and (e) create strategic capabilities. Strategic planning gives a comprehensive scope of the change and projects that focus on the strategic intent of continuously improve student, industry, and society satisfaction. **Change-project management** allows for the implementation of the quality desired by the customers. There are BPPs that optimise this strand of the Strategic Focus Wheel: (a) gaining alignment; (b) embracing change; (c) establishing a learning culture; (d) relating the micro to the macro; (e) measuring and reporting; (f) supporting distributed leadership; and (g) being up front. Once the necessary changes and projects are fully specified and understood the next challenge is making them work and this must be confronted earnestly. Achieving quality in a master's degree can only work out by co-ordinating the activities of the management, professoriate and quality assurance agencies.

Making strategies work is about managing operational risks, enabling and catalysing every desired change and project. Most change efforts stall or drift off, because there is not enough courage to deal with emerging problems and difficulties. The BPP of 'resourcing for the medium term' facilitates the working of the strategic plans. As each strategic plan rolls out, it is imperative to ensure that the current actions do not scupper future prospects. Often, excessive focus on the short-term and the desire for visibility constrain sustainability of quality assurance efforts in the long-term.

Strategic risk management means that risks must be managed at the strategic, management and operational level, so that every objective accomplished turns into a resource, and is a premise for the accomplishment of future goals and objectives. However small a risk appears, with QFD and Six Sigma, it must be managed, and the space for continuous improvement should be continually expanded. When Jauch and Orwig (1997), Srikanthan and Dalrymple (2003), and others claim that business models do not work, their explanations surprisingly turn to shortfalls pertaining to the practice of general management, and not to any specific stage, or tool, of these models.

In a nutshell, to emerge, diffuse and propagate continuity in programme improvements, it requires an 'Atlas of Change' that specifies the strategic issues needing attention, from whence we define the strategic intent and the changes and projects that make the desired quality happen. To create and sustain a momentum for continuous improvement the organisation needs a shared map of how new ideas can influence redesigning and rethinking and what it takes for an organisation to co-adapt with its environment. In sizeable, yet well thought-out and articulated leaps, educational quality gets assured. This is the quintessence of Figure 2.

Growth and Philosophy of QFD

QFD was birthed in Japan in the 1960s (Akao, 1997). The generic purposes for which organisations have been adopting QFD have not changed to date. However, some of the tools and techniques used at the time have been improved or altogether replaced by newer and more efficient ones. Generally, QFD was and is still being used for:

- guiding the establishment of QFD teams, and quality cycles;
- running Voice of the Customer and processing the gathered data;
- escalating processed Voice of the Customer data into marketing, management, services and products strategies;
- using Voice of the Customer in product planning matrices; and the planning, design, development and delivery of products and services; and
- designing correlation matrices and using these in interface mapping, strategic categorisation and cartography when establishing lean competitive organisational genomes.

The research questions were also based on these functions of QFD. This was done so that whatever the findings of the study were, they would at least be grounded in some theory of QFD. This paper argues that the failure or success of QFD ought to be debated in terms of these functions. Most prominently, QFD ought to be used to improve strategy planning and implementation, as well as for aligning BPPs with Quality excellence principles and practices.

In HE, apparently the use of QFD has been limited to curriculum design and review (Matorera, 2015). Little has been documented on the aspects of assessment and evaluation using QFD in its wholeness. Some have claimed use of QFD, yet in actual fact, what they refer to are QFD's com-

ponents, tools or techniques. These claims regarding the use of QFD arise from the perennial ambiguity of QFD, both as a mode of thinking, and as a methodology of enacting the 'thought' or mental model. ReVelle (2004:152) finds that quality professionals refer to QFD "by many names, including matrix product planning, decision matrices, and customer-driven engineering". This is a typical example of how a QFD stage/-tool/technique is referred to as QFD itself. A hermeneutic analysis of these terms show that matrix product planning (also called Product Planning Matrix), Decision Matrix (also called Goal Setting/Correlation), and Customer-driven Engineering (also called Customer Satisfaction Performance) are but stages of the QFD model. A hermeneutic analysis of the failures and disconnects in HE show that a disciplined application of QFD elements, tools, and techniques should improve the delivery of HE.

QFD versus Traditional Quality Assurance Approaches

Most traditional assessment and quality assurance models fall within the scope of some of the QFD stages, for instance, the gathering of stakeholder data is touted by almost every quality assurance model in HE. However, QFD goes further to assume that such data remains of no value until it has passed through the appropriate Six Sigma Roadmap, and has ultimately impacted the organisation's management, services, or product strategies. Traditional quality assurance models highlight the broad-based participation of both internal and external stakeholders. QFD distinguishes 'shallow' participation as inadequate. What is meaningful about participation in QFD is the continuity of the participation, inclusion of the points of view from the different participants in strategy and decision-making, and what Senge et al. (2012) refer to as "presencing". The implication of this is that QFD-based models ought to focus on how to keep an organisation in the most active interaction among internal constituencies, and with external stakeholders. This connectivity allows for joint validation of the alignment of processes and structures associated with the needs and wants of the customer groups (Akao, 1997).

Other models place emphasis on the quality of products and services. In QFD, quality does not receive focus until it has been validated by the customer, who, in terms of education, would be the student, industry and society. When we link QFD to Six Sigma as a measure (Revere & Black, 2003:379) we wish to achieve a zero error rate (p. 377), and reduce all defects in the institution (Kwak & Anbari, 2006:708). The key shortcoming of other models is their continued recognition of universities as having the key, if not sole prerogative, to define quality. In QFD, quality is conceptualised in terms of 'fitness for purpose'. This fitness for purpose is built on the foundation of the Voice of the Customer being translated through Six Sigma Roadmaps of Technology for Six Sigma (TFSS), marketing for Six Sigma (MFSS), design for Six Sigma (DFSS) and Six Sigma Process Design (SSPD) into a transformative type of education (Matorera, 2015). The 'design' for Six Sigma is embraced by five actions, namely: Define, Measure, Analyse, Design and Verify (Kwak & Anbari, 2006:710; Revere & Black, 2003:379; Yang, 2010:3-4). The transformation, of course, leads to fitness for purpose of the programme, as it betters the student's knowledge, understanding, skillset, attitudes, and belief system (Meirovich & Romar, 2006).

The Use of QFD in Programme Quality Assurance (PQA)

Whether or not QFD can serve the interests of Programme Quality Assurance (PQA) can be examined at different levels. On a philosophical level, the article argues that the use of QFD as a tool for PQA should be feasible. At a methodological level, QFD can only help in PQA when the QFD-model and the PQA-perspective share a common understanding of the nature of quality. If quality, in QFD is understood to be 'fitness for purpose', then QFD cannot be used in quality assurance for a programme that understands quality as 'excellence'/'value for money'/'consistence' (Matorera, 2015). In this sense, you cannot be frustrated if a thermometer fails to measure the air-pressure in a tyre, since it is not designed for that purpose. In HE, the purpose of QFD and of PQA is to ensure that the customer (student, industry, society) is perfectly satisfied. This means both QFD and PQA ought to be in agreement that Customer Satisfaction Performance refers to when the HE products and services are fit for the purposes of the student, industry and society.

The implication, then, is that HE should have robust strategies for hypothesising quality, for planning that quality and offering it as expected by the customers. This is where the various BPPs come in to ensure focus, integration, linkages and alignments. In fact, managing for the integrity of the BPPs is as important a strategic intent as is assuring high quality education. This is not the case when Voice of the Customer is inadequately processed, or inappropriately escalated to management and quality strategies, or where the metrics and standards of quality are in disconnect with the throughputs.

The next argument is based on a kind of gradation. Writing about the structural nature of QFD, Ficalora and Cohen (2009) talk about QFD at 20,000 feet, 10,000 feet, and the ground-floor. This resembles the structure of PQA: strategic level, management level, and the operational-technical

level. It is not enough, however, to have this resemblance. With traditional models and HEIs, the three levels operate as fragmented reactive functions. In QFD, the three are operated as aligned, integrated, disciplined entities aimed at creating customer value (Zairi & Youssef, 1995).

Linguistic issues will be discussed next. It is widely and erroneously understood that QFD is a 'manufacturing aspect', and that HE is exclusively a service matter. In the HEIs, as in factories, goods are produced; for example, HEIs produce texts, modules, and handouts, amongst others. These are but a means to a goal. The goal in education is to transform lives by adding value to the knowledge, attitude, understanding, and behavioural competences of the student so that he is able to understand his world better. In this way, the student is better able to do more meaningful research, and thus able to create goods that improve the livelihood of all society. A person who reasons through what he experiences, and who is able to create solutions for his problems, has reason to be more satisfied with the HEI that has developed those skills, and not with those that were unable to develop them.

QFD has thus erroneously been allocated to the engineer just as education has been to the teacher/professoriate. The two protagonists (engineer and teacher) work quite similarly. Both deal with the application of social, economic, scientific and practical knowledge, and models as they research, invent, design, develop and improve structures, processes and new modes of thinking (Matorera, 2015).

What is in PQA that QFD can modify?

The hallmark of a QFD approach is, as explained by Ficalora and Cohen (2009), to flag gaps in processes and knowledge, and further, to show how these can be closed so that total Customer Satisfaction Performance is kept high. The major clefts in the practice of service delivery, including in education, are the inconsistencies between organisational configuration-and-strategy; strategy-and-culture; and culture-and-market demands (Abdous, 2011; Pearce & Robinson, 2009). Directly, or otherwise, these disconnects multiply the cracks among hypothesised, planned, marketed, offered, expected, and perceived quality (Franceschini, 2002).

Hypothesised quality and planned quality

This gap is the result of a lack of vertical alignment between the strategic and management levels. This relates to: (a) DFSS, where there are inadequate quality plans, because of insufficient quality culture; top management is only marginally committed to quality; economic and quality objectives are mutually exclusive of each other; (b) SSPD, where quality concepts are not effectively translated into operational specifications; (c) MFSS, where strategies are excessively inwardly focused; and (d) TFSS, where the organisation is low-tech, or using obsolete and inadequate technology.

Planned quality and marketing quality

This discrepancy arises mainly from a disconnect between general or niche market demands, and the institution's capacity to, at least, break even. This normally results in over-marketing, excessive marketing bluff, and market signalling, and even outright lying. What is claimed and marketed is far better than what is planned.

Marketing quality and offered quality

This gap is caused by the internal, interface, and aggregate inadequacy of the Six Sigma Roadmaps either due to poor DFSS, SSPD, MFSS and/or TFSS.

Offered quality and expected quality

This gap arises from poor communication within the organisation, and between the organisation and the customer market, or because the student joined the 'wrong' programme because s/he did not do sufficient market research or shopping for programmes. This may happen when budgets cannot sustain the 'critical to quality' aspects of education delivery.

Hypothesised quality and expected quality

The above variance is normally due to the inadequacy of market research, including translating MFSS, SSPD, TFSS and DFSS into quality and management strategies. For instance, inadequately conceptualised DFSS leaves the organisation highly administrative, a situation that can stymie the bottom-up flow of ideas.

Planned quality and offered quality

This gap is generally due to a confused definition of roles and objectives (DFSS), under-skilled personnel, clogged interfaces (SSPD), poor teamwork quality (TWQ) and low team intelligence, top-heavy decisional infrastructure, and inefficient control and evaluation systems (Franceschini, 2002).

The institutionalisation of QFD confronts the aforementioned governance, strategy and diffusion issues, which in turn has to do with one or more of the following: DFSS, SSPD, TFSS, and MFSS. The strong emphasis on in-house training and moving staff right from white to blackbelt status, dissolves the issues of skills shortage. Interface mapping, apart from assisting with resources and time, shows which strategic categories and capabilities matter the most, as well as the infrastructure of the most competitive genomic organisations.

The Customer in QFD Higher Education Contexts

Building a compact, embracive and singular app-

roach to quality in HE is usually constrained by the different constituencies, each having their own idea of who the customer is, and to whom they should be bound. This would fragment and disintegrate the organisation, turning the focus to a turf war rather than TWQ institutions. By adopting a Six Sigma approach that treats Voice of the Customer on its merit, rather than clout or role of the proponent, QFD gives the 'qualifying' process an enhanced opportunity for greater Customer Satisfaction Performance. Figure 3 shows how QFD could balance the concerns of everyone involved. The four pillars (voices) captured in the model were drawn from Ficalora and Cohen (2009). The details of the participants that reflect in the model emerged from our own experiences as we contextualised QFD to the Higher Education scenario.

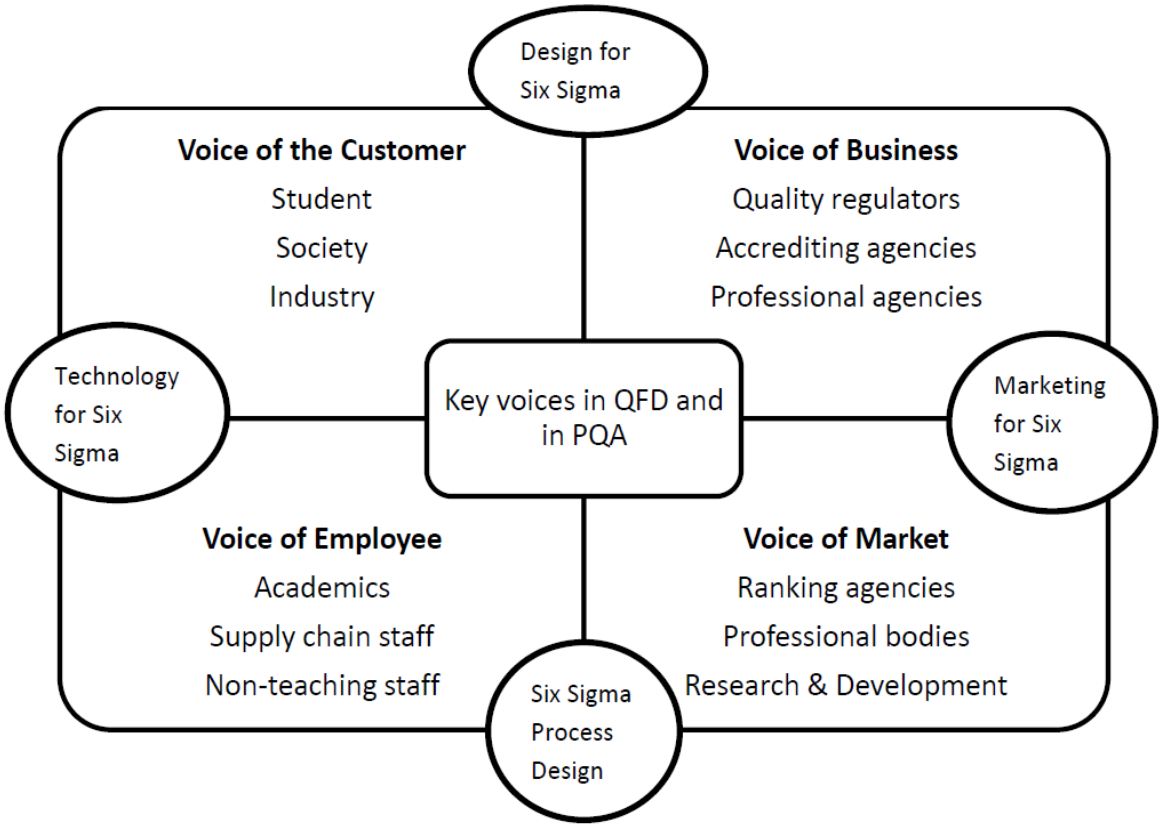

Figure 3 Combining Voice of the Customer for Six Sigma Roadmaps (Matorera, 2015)

Current practice apparently lacks a robust and more serious practice of 'peaceful', quality-driven engagements between students, business, and quality assurance agencies (QAAs); between the professoriate, students and QAAs; QAAs, the professoriate and business; the professoriate, business and students as shown in the combinations in Figure 3 (Matorera, 2015). Some higher education institutions (HEIs) tend to confuse themselves by treating the voices of the QAAs and their ministries as superior to the voices of students, of the academia, and of industry. Considering these voices first, then trying to adsorb the 'second class' voices, distorts any efforts towards customer orientation. Traditional HEIs apparently live on the fallacy that accreditation or compliance to the Minister matters. In QFD, they matter to the extent of their contribution to customer-validated Customer Satisfaction Performance.

Research Methodology

Introduction

A structured qualitative phenomenological case study approach (Maree, 2007) was followed. A quantitative approach was thought not to be able to mine out the nuances of model adoption and the diverse perspectives of all the constituencies regarding quality assurance and management within and outside of a business school. To edify a more complete understanding of how staff behaved in response to the QFD model, we crafted a set of analytical research sub-questions discussed earlier in this article which, where we treated as miniature cases within the bigger case constituted by the main research question. The disaggregation of the main research question allowed us to follow upon smaller elements of the adoption of QFD: the use of tools; the stages of the model that were followed, and how; as well as the response of management.

Research Sample

Using a theoretical sampling approach, the final purposive sample consisted of staff within management at both the mother university and the business school. Eight academics within the business school, three directors at the Zimbabwe Council on Higher Education (ZimCHE), and two officials within the Ministry of Higher and Tertiary Education (MHTE) in Zimbabwe were sampled for the study. Five single focus group interviews were held with five alumni, and nine current and prospective students, as well as some human resource specialists. Nine students and five alumni were also drawn into the focus group interviews. In total, 27 (n = 27) participants were samples for the study, the main criterion being participants' involvement, participation and understanding of total quality management in the business school, university and higher education environment. All participants were also involved, participated in or had an understanding of the dynamics of the masters programme under review. A validation study was finally undertaken towards the end of the study to check the validity and business potential of the findings. The validation incorporated those participants who had been most referred to as 'points of high concentration of data' and of greater influence on the different processes. We also validated the findings with a quality assurance specialist in the private sector and in the public sector, as well as students and alumni.

Data Analysis

A fundamentally soft systems analysis was used. We recorded and transcribed the interviews, and produced hard copies with lots of white space to jot down new findings, re-enforcers, comparatives, and contradictions. We compiled a portfolio of all the interviews, which accumulated ideas and symbols each time we reviewed it. We also transferred the recordings onto our tablets, smartphones and laptops, through which we played back the recordings several times to gain a deeper understanding of the interviews. Combining a soft systems analytic perspective and the constant comparative technique, we noticed a genealogical connectivity (negative and positive) between our perspectives from one point of view to another. Variably, we built new ways of thinking, deconstructed and in some cases replaced previous assumptions. The basis of the case study was to align the theories and establish how one piece of data fits in with the rest.

Findings and Analysis

Introduction

Findings are discussed and analysed starting with a focus on the nature of QFD (addressing the first research sub-question); then, the strategic motivations for its adoption; followed by staff response to QFD (addressing the second and third research sub-questions); effectiveness of its implementation (addressing the fourth research sub-question); staff perception of its relation to educational assessment and quality assurance (addressing the fifth research sub-question); and finally, management's response to the application of QFD (addressing the sixth research sub-question). The discussion reports the responses of senior staff members (SM) and academics (AC) teaching on the programme, as well as the comments of a student who participated in one of the focus-group interviews.

The nature of QFD: the nature of QFD can be gleaned from academic sources, practitioners' blogs, consultants and other specialised sources. Most academic sources tend to be monolithic, focusing on QFD as a system, an approach and a philosophy. Practitioners and consultants tend to look on QFD as a methodology, supported by a plethora of tools and techniques. Earnest adoption of QFD opens space for asking somewhat embarrassing questions about company-customer interfaces, company management strategies and products and services quality. For more effective operationalisation of QFD, its duality as a philosophy and the methodology for customer satisfaction needs to be appreciated (SM1; AC3). Each needs the other. Institutionalisation of the philosophy is as infertile as is barren the implementation of its methodology alone.

Motivation for the adoption of QFD: QFD emerged from a protracted context, institutional and programme analysis akin to a Pugh Concept Selection process (Pugh, 1996). A number of pull and push, external and internal forces contextualised the birth of QFD in the CUTGBS. The Director of CUTGBS emphasised that they are "value driven, for instance they put emphasis on the product, and what they are teaching". He further argued that "it must be benchmarked, put emphasis on personnel, the people who teach, we put emphasis on service and we also put emphasis on our image". Staff mentioned marketing, market, economic, financial and quality motives. Operating in a free and highly competitive HE market on a traditional model would be unthinkable. A senior manager (SM5) had the following to say:

> *It was not a question of reconciling the national and the institutional. No. The main issue was understanding the context and aligning the programme to the broader trends and the particularities of the university context* […] *how do you carve-out a niche and steer in it, the kind of defining self in a context.* [sic]

Managing and portraying an image of uniqueness are strong marketing behaviours particularly in highly contested markets like the master's degree and the desire 'to look good' also influenced the choice for QFD. One lecturer responded as follows: "we work for it (quality), I think everyone is for the quality agenda, we are doing it, so it must succeed''. Another staff member emphasised

senior management's enthusiasm in adopting a new model as follows:

> *the Vice Chancellor is keen about quality, you know him, what he says he stamps his feet, yes* [...] *the good thing is he makes the resources available to chase that quality and bring it home.* [sic]

There was evidence of a shared vision about being the leader in Business education, where one academic explained how they were benchmarking from the best of Business schools in the United States of America (USA), the United Kingdom (UK), Asia and Africa. A senior staff member (AC2) reported the desire to "be the Harvard of Africa", and another (AC1) spoke of Yale University as a model. Salmi (2011), however, warns against excessive benchmarking, saying that it does not always create excellence. In their explanations of the "optimal distinctiveness theory" (Leonardelli, Pickett & Brewer, 2010), "strategic balanced theory" (Deephouse, 1999) and "market signaling" (Anderson, 2006), show that the "heat of the market" can generate very unique strategy models. In times for visibility and image management, individuals and companies find QFD, or Six Sigma of great service, mainly due to their reputation in the market. QFD was seen to serve these motives, including the communicative function, with both internal and external stakeholders.

CUTGBS staff showed an acceptance of the QFD model, with one staff member (AC1) expressing that its adoption was "…the best way forward, in the midst of many market and internal challenges". We analysed response to QFD with the assumption that response could be a rejection, or a partial or a total acceptance. Staff reached consensus that QFD created a fertile basis for competitiveness. On a methodological basis, staff became a functional QFD team. This was multi-functional in nature, and included some non-CUTGBS members. The team however needed to improve on its balance of representatives of Voice of the Customer, Voice of Business, Voice of Employee, and Voice of Market. In cases where an institution is constrained in its on-going representation of these voices, they ought to devise strategies for obtaining this representation from ad hoc membership, or they should establish virtual teams. There was equally positive response to the gathering of Voice of the Customer, and attempts to plough this into products, services, management decisions and strategies. Another academic (AC4) explained that the CUTGBS was "…holding full day sessions with students and other stakeholders to discuss institutional and instructional issues". Voice of the Customer is crucial and axial in construction of every stage of QFD. While the use of Six Sigma Roadmap analysis of Voice of the Customer was in place the adoption of some techniques for perfecting this stage left something to be desired. Meeting customer (student, industry, society) requirements by running Competitive Satisfaction Performance took place in the CUTGBS. The same academic (AC4) remarked that "things have changed greatly over the years, we now have meetings with students […] we get feedback per course per lecturer […] and we act on that data". Similar comments came from AC6. From one of the focus group interviews, student ST3 remarked that "…we may know what we want taught, but who do we tell […], and do we get that in the end?" It is, however, important to note that there was a need to find a balance of strategic fit between a market-in and a market-out perspective, noting that often, comparatives use volatile criteria and are more notional than rational. In summary, the adoption of QFD followed the logic of social legitimacy, economic gains and market supremacy, as emphasised by the CUTGBS mission of 2012 mentioning: (a) profitability; (b) growth and sustainability; and (c) market expansion, by 20 percent. QFD was therefore chosen as it appeared to be the best candidate model for solving the many strategic concerns that had arisen during the protracted market, and institutional and programme analysis.

Staff responses to the Implementation of QFD: CUTGBS staff showed an acceptance of the QFD model, with one staff member (AC1) expressing that its adoption was "...the best way forward", in the midst of "...many market and internal challenges". We analysed response to QFD with the assumption that response could be a rejection, a partial or a total acceptance. Staff was idiosyncratically bundled on that QFD, creating a fertile basis for competitiveness. On a methodological basis, staff had a working QFD team. This was multi-functional in nature, and included some non-CUTGBS members. The team however needed to improve on its balance of representatives of Voice of the Customer, Voice of Business, Voice of Employee, and Voice of Market. In cases where an institution is constrained in its on-going representation of these voices, it ought to devise strategies to obtain this representation from ad hoc membership, or virtual teams. There was equally positive response to the gathering of Voice of the Customer, and attempts to plough it into products and services and management decisions and strategies. An academic (AC4) explained that the CUTGBS was "...holding full day sessions with students" and other stakeholders, so as to discuss institutional and instructional issues. Voice of the Customer is crucial and axial, in construction of every stage of QFD. While the use of Six Sigma Roadmap analysis of Voice of the Customer was in place, the adoption of some techniques for perfecting this stage was insufficient. In the next two paragraphs we describe that the use of some data

processing techniques weren't up to scratch, notwithstanding that any organisation can adopt and use QFD to its own measures.

Meeting customer (student, industry, society) requirements by running Competitive Satisfaction Performance was taking place in the CUTGBS. It is, however, important to note that there is need to find a strategic balance between a market-in and a market-out perspective, noting that often, comparatives use volatile criteria and are more notional than rational. With reference to Competitive Satisfaction Performance of the MSc Programme a senior academic (SM1) noted, "… we don't teach MBA stuff here, we don't teach people to be general managers", and "this programme is for decision makers, Chief Executive Officers (CEOs)". While no tracer studies were done to establish the performance of graduates in industry and society, the assumed standards of success of the MSc Programme was hinged on industry and alumni feedback. One manager explained that alumni who had gone through the degree programme were best placed to say what they were finding transferable in the workplace and what did not work and had wasted their time. From such comments the CUTGBS would work out improvement plans (SM1).

In analysing staff perception of QFD, we assumed that staff could might have different perceptions as to the different stages of QFD, and that issue perception relates to the extent of practice implementation. Staff generally perceived QFD as helpful in focusing CUTGBS strategies on assessment and quality assurance in the MSc Programme. There was, unfortunately, not always agreement on the choice of QFD. One participant (AC4) described the process of adopting the QFD model as 'emotive at very isolated instances' while another senior manager (SM6) explained how he was obliged to find strategies to deal with "…late adopters, and adamant resistors". But once the process started, lecturers were required to present detailed lesson plans, and upload them to a portal that would be accessed by students, lecturers and the Dean. Peer lesson visits and evaluations were now a requirement. Voice of the Customer analyses were jointly conducted. Student Evaluation of Teaching Effectiveness (SETE) were discussed one-on-one and in the boardroom. It had become common practice to draw issues from Voice of the Customer, SETE, Competitor Satisfaction Performance, and to devise individual and team Performance Targets for the Annual Performance Appraisals. In-house up-skilling projects and training were focusing more and more on the performance targets and learning needs analyses derived from Voice of the Customer rather than "... global nice for their sake, 'hit-or-miss' training", explained a CUTGBS staff member (AC1). There was a "comprehensive strategy" of improving and aligning "every facility", as explained by a CUTGBS staff member. Lecture rooms were being digitalised. Lecturers and students were at various stages of learning and implementing e-learning and m-learning technologies.

The response of Management to QFD was as follows: most touted response of management to QFD was that it enabled and facilitated its institutionalisation. Secondly, an academic noted that the CUTGBS was "...emerging as the model of innovation in the university" (AC6). Greater autonomy was also being granted, where the CUTGBS was operating "...somewhat like a small business and like a university department too..'' (SM1). Another staff member (AC5) explained the recent way in which the perception that a business school had to live by the example of thinking and doing business, had gained space in university management. However, this thought of business schools teaching business by being business themselves, was not unique to university management. A manager (M1) in the Ministry of Higher Education and Training explained that "...selling education was big business..." and that "...there was no free education in the world'' as long as "...any government gave it from taxpayer's money, which in fact is not a free donation". The ZimCHE was critical about bogus programmes and "subjects". A director (D1) within it explained that they were raising their stakes in assessment and quality assurance in HE. Senior management however, was more concerned about standards, quality and quality management. The Director of the CUTGBS had this to say about concerns about quality at the top management level:

> *I am in constant contact with the chiefs, the Registrar, the Vice Chancellor, and the Dean, these guys are hot about quality issues. They want standards, what is going on and what is stagnating, what are the alumni saying, you see all those things they think they can interpret quality from.*

Another academic stated:

> *we are all clear that we must achieve superior quality, yes, what we don't always have head-and-tail about is the methodology, can we look at what we are doing and say 'uh-uh', I am doing quality? Knowing and doing you see?*

There were some discrepancies found, mainly due to the existence of two centres of power: the mother University, and the Business School itself. An academic explained how the demand to raise funds through consultancy worked against their need to prepare detailed and well-researched lessons, and to provide mentorship to research students. Another academic pointed out that the demands regarding research output would not normally tally with their idea of research for institutional development. Nevertheless, others voiced the discrepancy between numbers and staff for the compulsory courses.

Conclusion

It is feasible to apply QFD and Six Sigma roadmaps in educational measurements, assessment and quality assurance. QFD proffers a philosophical basis for systems thinking, vision sharing, team learning, mental modelling and personal mastery, all of which are critical factors in sustaining profound change in HE. When Six Sigma roadmaps are used within QFD, they optimise the translation of stakeholder wants and needs into organisational strategies, products and services quality. Thus QFD provides the philosophy, methodology, tools and techniques for improving quality in HE by aligning hypothesised, planned and offered quality to perceived quality. QFD and Six Sigma challenge the prerogative to define standards of quality that has traditionally been enjoyed by university managements and quality assurance bodies.

The amount of QFD an organisation adopts ought to be based on the perceived net balance between the model's ability to create opportunities and to confront the current and future risk (threats) envelope of the organisation. In a summative way, the emergence and adoption of QFD in the CUTGBS was determined by the logics of technical efficiency, of social legitimacy and image management in a market heavily contested by many business schools. The overarching perception was that once the quality of the MSc Programme is properly sustained, all other benefits fall into place.

Ficalora and Cohen (2009) refer to QFD as a 'game-changer'. The transformations in the HE context create a necessity to redesign, reorient and rethink the meaning and implications of programme quality, in terms of assessment and quality assurance. Adopting models that are at par with these transformations improves adopter's social legitimacy, and strategically balances products and services to their customers' wants and needs. However, models serve as guides and their productivity is a function of the civility, creativity and professionalism with which they are metabolised at the strategic and operational levels of the adopting organisation.

Implementation of QFD was incrementally beneficial, optimising first on the easier-to-implement aspects, and each time creating strategic capabilities for the forthcoming tasks. If an organisation is able to create and sustain its own motivation, it implicitly empowers the diffusion and calcification of its adoption. Adoption takes a long time, and it requires certain patience.

The mechanistic perceptions of QFD and Six Sigma as engineering tools continue to constrain their adoption in the services sector. This notwithstanding, the impact of QFD as a management, social and marketing tool is becoming increasingly enticing in a HE landscape increasingly characterised by marketisation, commoditisation (weakening the ability of the manufacturer to price products competitively) and cut-throat competition. QFD flags such inconsistencies, and shows how they can be corrected, particularly by linking the design, management and development of technical descriptors to the requirements of market-oriented teaching and learning.

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