RETHINKING EDUCATION QUALITY: TOWARDS A PROCESS-BASED APPROACH FOR BOTSWANA'S BASIC EDUCATION SYSTEM

Shandulo Maphorisa
Inspectorate Services Unit, Ministry of Basic Education
smaphorisa@gov.bw

Abstract

Attempts to holistically reorient Botswana's basic education system towards quality hitherto remain a pipe dream. This paper posits a shift in thinking premised on the notion of understanding, managing and improving quality through a process-based approach; a methodology which for purposes of this study deliberately utilizes synergetic versions of the International Organization for Standardization (ISO) 9001: 2015 standard, the Management System for Educational Organizations (ISO 21001: 2018) and the Plan-Do-Check-Act model. The paper teases out the logic and potential of implementing the process-approach in Botswana's basic education system as a response to the globalization of education practices. A national survey purposively tapping into senior secondary school heads' perceptions was conducted. Relatedly, national inspection reports were reviewed together with literature available. A multivariate approach was applied to deconstruct the entire process matrix of inputs, outputs, processes and outcomes. Furthermore, two tracer studies at varying basic education levels were conducted to appreciate the philosophy of systems thinking with regards educational outputs and outcomes. Results of the study signal the model's potential to serve the basic education sector with minor modifications relating to compatibility. Education quality is in this hybridized process approach contingent to inputs, processes and outcomes. Outputs are factored in provisionally depending on contextual realities, quality control measures and maturity level of the education system over a continuum. The paper recommends that the process paradigmatic approach must be developed, documented, implemented and maintained for continual quality improvement in basic education.

Key words

Quality, Education system, Process-Based approach, Quality Management System, Quality Improvement

Introduction and Background

The process-based approach, though seemingly a new philosophy in basic education, is majorly perceived as a perfect model for understanding, managing and improving quality. This is primarily in response to the demands of the global economy that is premised on a competency based framework. The application of a system of interrelated processes within an organisation, together with the identification and interactions of these processes, and their management to produce the desired outcome, is referred to as the "process approach", ISO

9001: 2008 (2009); ISO 9001:2015 (2015); ISO 21001: 2018 (2018). At the heart of the process approach lies organizational effectiveness and efficiency.

The process approach is widely used in a series of Quality Management Systems standards including the more popular revised version of ISO 9001: 2008, that is ISO 9001:2015 and the more specific Management System for Educational Organization (EOMS) standard, ISO 21001: 2018. A deliberate synergy between ISO 9001:2015, ISO 21001: 2018 and the Plan-Do-Check-Act (PDCA) model introduced by Deming (1991) in Farooq et al. (2007) cannot be underestimated in this paper. By analogizing the education sector as a service industry to the production industry, the proposed model's potential to serve the former is critically deconstructed. This is simply because the concepts of quality and the process approach owe their origin from the production industry (Levina et al. 2015; Sohel-Uz-Zaman and Anjalin (2016). Understanding quality thus requires our full appreciation of its parameters as methodically a complex matrix of inputs, outputs, processes and outcomes hence the process approach. Quality is the degree to which a set of inherent characteristics fulfils (customer) requirements (1SO 9001:2008, 2009); Pokorni, 2004; Daniel and Berinyuy, 2010). Available literature has also amply demonstrated that quality is a broad, complex, contextual, dynamic and technical concept both in definition and measurement. This possibly explains why the quest for quality is yet to be meaningfully addressed within the global space (Education for All Global Monitoring Report, 2015).

What is perhaps more attention-grabbing is the fact that at the heart of the process-based approach, ISO 21001:2018 and ISO 9001:2015 standards have infused risk-based thinking. The logic here is premised on the assumption that not all the processes of a quality management system represent the same level of risk in terms of the organization's ability to meet its objectives, and the effects of uncertainty are not the same for all organisations (ISO 9001:2015, 2016). Thus, risk-based thinking enables an organisation to determine the non-conformities that could otherwise cause its processes and its quality management system to deviate from the planned results, to put in place preventive controls to minimize negative effects and to make maximum use of opportunities as they arise (ISO 9001:2015, 2016).

In the context of Botswana, the quest for education quality is as old as the first National Policy on Education (NPE) of 1977 which recommended as a priority for the quantitative and qualitative improvement of primary education (World Data on Education, 2007). Over this continuum, subsequent policy reforms and other international frameworks invariably continued their advocacy for bringing quality to the fore across levels. These among others include Education for All (EFA) of 1990, the Revised National Policy on Education (RNPE) of 1994, National Development Plans (NDP 9 & 11), Agenda 2030 (Sustainable Development Goal number 4), Vision 2036 and more recently the Education and Training Sector Strategic Plan (ETSSP 2015-2020) which seemingly provides an alternative and impactful trajectory geared towards the process approach.

Vision 2036 (2016) envisages that Botswana society will be knowledgeable with relevant quality education that is outcome based, with an emphasis on technical and

vocational skills as well as academic competencies. Likewise**,** ETSSP (2015-2020) as a new transformational agenda envisions a shift from resource based to a knowledge based economy in which knowledge is coupled with relevant skills, competencies, behaviour and attitude which are fit for purpose in the global village. The process approach is to a larger degree seen through the lens of an Outcomes Based Education (OBE) which is one of the priority areas of ETSSP. Makwinja (2017) however argues to the contrary that ETSSP did not introduce any innovations because the ideals espoused are a replica of the previous policies such as the RNPE. While this argument holds water, perhaps what matters most is implementation, belated as it may be.

A proposition for the process approach model for Botswana's basic education system was influenced by a number of factors. Sampled inspection reports (2014-2019) nationally point to ineffective schools' internal processes (quality of planning, teaching, learning, assessment and instructional supervision) thus compromising on learner achievement standards. Research has amply demonstrated that teaching practices in Botswana classrooms remain teacher centred than learner centred hence relegating the learner to a receptacle of knowledge (Tabulawa, 1998; Makwinja, 2017; ETSSP 2015-2020; Inspection reports, 2014-2019).

Results of International Cooperative Studies like Trends in International Mathematics and Science Study (TIMMS), Southern and Eastern Africa Consortium for Monitoring Educational Quality (SACMEQ) and Progress in International Reading Literacy Study (PIRLS) have further indicated that the quality of Botswana's education has remained very low (Botswana National Implementation Plan for Sustainable Development Goal – Education 2030, 2018; Makwinja, 2017). For example, preceding these studies, an independent consultancy study by Tabulawa et al. (2013) also points to falling educational achievements levels since 2004. A revisit of the RNPE of 1994 summarily acknowledges that although not by design, the success in quantitative development of the school system has not been adequately matched by qualitative improvements (Ratsatsi, undated). In this connection, it could be judged unfortunate that the quantitative aspects of education have become the main focus of attention in recent years for policy makers (EFA Global Monitoring Report – 2005). Given this background, there is need to rethink education quality and develop a quality management system model through the process approach.

Theoretical Framework

This paper is among others mainly informed by the philosophy of systems thinking (Conti, 2006; Langley, 2007). Systems thinking in education according to Matorera (2018) are,

"A mental tool of understanding how sub-components of a whole influence one another so that resolving problems within one part of education should neither negatively impact the performance of other areas nor create unforeseen consequences". (p. 31)

The main idea of this approach, according to Alkutich (2016), is to identify the key elements that combine and work with each other to construct the whole process. If any of these elements is not functioning as required, then it will affect the process as a whole. Omari (1995) in Matete (2009) similarly holds to the view that system thinking is concerned with the analysis of the ways the parts are related and impact on each other. Omari (1995) further argues that when there is connectivity and linkage between the different parts, then there might be a massive achievement of the goals and objectives in improving the quality of education in the society. Education is thus characterised by various processes forming a complex system.

Three thinking systems which form a nexus within the process-based approach configure the position of this paper and these are, quality thinking, process thinking and risk-based thinking. From a strategic business stance, quality thinking and process thinking co-exist within the larger complex systems thinking framework (Conti, 2006; Langley 2007). Gaponyuk et al. 2013) reaffirm the relevance of the systems perspective by linking it to the Concept "theory of education management process", which in his submission forms the methodological premises for the conceptual model of quality management through a complexity of interconnected components-processes. What sounds distinctive about this theory is its innovative character as it focuses on an educational system producing a highly competitive kind of personality (Gaponyuk et al. 2013).

Correspondingly, Zhang and An (2010) draw our attention to the theory of all-round educational quality which places emphasis on the transition of the forms of management from the traditional one-dimensional view of performance to the full range of view on quality. Thus education quality is not only to train students to possess knowledge, but also to help them have other various qualities, such as working attitude, sense of cooperation and competition, professionalism, moral cultivation, environmental adaptability and mental endurance capabilities (Zhang and An, 2010; Sergeeva et al. 2019 in Kucińska-Landwójtowicz, 2020). Since learning outcomes are important to education quality, suffice it to also infuse two interrelated learning theories in pursuit of quality within the process-based approach; the humanist/relativist and constructivist learning theories. From a relativist epistemic stance, perceptions, experiences and needs of those involved in the learning experience mainly determine its quality (EFA Global Monitoring Report – 2005). The constructivist epistemic stance echoes a similar line of thinking by focusing on the learner as the main determinant of quality.

Purpose of The Study

This paper explores the applicability of the process-based approach in the basic education sector as prescribed by ISO 21001:2018, ISO 9001:2015 and the PDCA model. The paper intends to emphasise the need by the education sector to introduce a Quality Management system using a Process-based approach in teaching and learning processes. Such an approach is assumed to manage quality by embedding an organisational culture and philosophy of continual quality improvement. The study demonstrates that, while the process

approach is a complex matrix of inputs, outputs, processes and outcomes, the focus of educational quality should mainly be on inputs, processes and outcomes than outputs to satisfy the demands of the competency based global economy.

Literature Review

By quality management system we understand "structure, procedures, processes and other necessary resources required for the application of quality management "(Vlašić, et al. undated)**.** The works of Wibisono (2019) expatiate on the fact that educational organisations should as a requirement adopt the newly introduced management system standard ISO 21001:2018. This is simply because it is not only more specific to education but it is also intended to help educational institutions work on their continuous improvement path by applying a robust, standardized management system. Notwithstanding the specificity of the standard, the researcher explores and expands the existing knowledge base by proposing a synergetic model that combines ISO 21001: 2018, ISO 9001: 2015 and the PDCA cycle. Such a move by the researcher resonates well with Matorera's (2018) appeal to researchers that it should be of interest to explore the potentials of hybridising quality management models in education. The design process focuses on inputs, processes, outcomes (competency based framework) and disregards outputs conditionally. While the implementation of standard ISO 9001:1994 was mostly in the area of production and less in the area of service, its new version ISO 9001:2000 introduced the so-called process approach to quality management (Pokorni, 2004). ISO 9001: 2008 (2009) and ISO 9000:2005 (2006) highlight in the context of production industry that an activity or set of activities using resources, and managed in order to enable the transformation of inputs into outputs, can be considered as a process.

Proponents of the process approach argue that there is logic in adopting the model even in educational contexts. As measures of quality, standards are increasingly becoming needful in shaping the direction of organisations for continual improvement. A process approach, as one of the basic principles of Total Quality Management (TQM), can be considered as the main methodological approach in international standards ISO 9000 (Deming, 2011 in Levina et al. 2015). With this approach, according to Levina et al. (2015), the desired result is achieved more efficiently if the various activities and related resources are managed as a process. The basic principle to remember is that Quality starts with the customer (customer requirements) and ends with the customer (customer satisfaction) and again starts with the customer (ISO 9001:2008, 2009; Tummala and Tang, 1996). In the same wavelength, Levina et al. (2015) and Sohel-Uz-Zaman and Anjalin (2016) maintain that the Quality Management Process-based model is a framework aimed at meeting customer requirements, customer satisfaction and continual improvement. What is perhaps lacking is who the main customer is amongst a plurality of customers and whether the customer sufficiently plays the perceived role as prescribed by the standard. Unintended consequences such as subjectivity tend to occur in this context.

Džinić (2016) maintains that the main problem with quality in the public sector emanates from definition and measurement. This is essentially because measurement of service quality is a function of many determinants. The researcher comes to terms with defining quality as the degree to which a set of inherent characteristics fulfils (customer) requirements (ISO 9000; 1SO 9001:2008, 2009; Pokorni, 2004, Daniel and Berinyuy, 2010). From a business model approach and according to literature on six-sigma as another quality improvement method, quality should be looked at from the customer's perspective, not ours, that is, we must look at our processes from the outside-in (Levina et al. 2015). Matorera (2018) and Eze (2009) argue that learner quality is the main determinant of quality. UNESCO Education Strategy 2014 – 2021 (2014) and EFA Global Monitoring Report (2005) indicate that the main determinants of quality are quality processes in terms of teaching, learning, curriculum, pedagogy and assessment of learning outcomes.

Using a mixed research approach, a study conducted by Maimela and Monyatsi (2016) revealed a positive relationship between the availability of quality educational resources in Botswana primary schools and academic performance. ISO 21001:2018 (2018) also indicates that top management must avail appropriate facilities and resources as requirements for quality learning. A qualitative research study by Iloanya (2014) revealed a strong relationship between teacher quality and the quality of teaching in Botswana. Inspection reports (2014-2019) through triangulation of data established a process gap in the quality of planning, teaching, learning, assessment and instructional supervision which compromised the learning outcomes. Tabulawa (1998) in what he calls the 'technicist' approach to the problem of pedagogical change argues that a mere injection of resources into a system that is otherwise perceived as deficient may not necessarily influence pedagogical paradigm. Lynch (2016) in Maphorisa (2019) similarly maintain that the focus on inputs does not necessarily lead to noticeable improvements in student achievement and that school reform can no longer rely mostly on giving schools more resources since time has shown that inputs have no real impact on improving student learning outcomes. The researcher concurs with submissions that resources are a key feature but only if the primary intension is to mainly achieve outcomes than outputs within a complex, contextual and technical matrix. It must be borne in mind that improving all aspects of the quality of education remains a key challenge (UNESCO Education Strategy, 2014-2021, 2014).

An independent consultancy study by Tabulawa et al. (2013) has observed that Botswana's education system focuses more on inputs and outputs than processes and outcomes. Inspection reports, (2014-2019) have flagged ineffective internal processes (quality of planning, teaching methodologies, learning, assessment and instructional supervision) thus confirming this observation. Matorera (2018) asserts that institutional processes in the classroom must transform from being didactic and focus on developing critical thinking skills, systems thinking and personal mastery. In this way, the epistemological notion of knowledge as a social construction is underscored as a learning theory. In pursuit of expanding our knowledge base, the researcher makes a supposition that the process approach cannot be inherited wholly from the production industry perspective when we talk a knowledge based economy that is driven by an outcome or competency based

education. As such, the new dimension modifies the model so that it is perfectly plugged into the new educational transformation. Outputs (grades) are therefore detected non-conformities which can only be included the whole equation of the model depending on context. In this sense, there is need to differentiate educational outputs from educational outcomes. This is simply because outputs are a function of the grading system which traditionally perpetuates an 'output based education' than an outcome based education.

Applying a parallel model in which outcome based education works side by side with the grading system is therefore seemingly creating unintended but subtle educational tensions due to paradoxes and/ or contradictions that are inherent in the latter. One such paradox is failure by the grading system to produce what Castell's (1997) in Tabulawa (2009) terms as a new kind of worker or the 'self-programmable' worker or lifelong learner, that is one who meets the demands of the 'new' economy. ETSSP (2015-2020) describes this situation as a mismatch between qualification and labour market requirements. This downplays a knowledge based economy as augmented by the 21st century skills. Such a leaner should demonstrate 21st century attributes such as creativity, versatility, innovativeness, critical thinking, problem solving skills, and a positive attitude towards team work (Castell's, 1997 in Tabulawa, 2009; ETSSP, 2015-2020). This resonates well with what Zhang and An (2010) term the theory of all-round educational quality.

Deming (1991) in Farooq et al. (2007) as the pioneer or proponent of TQM and the Deming cycle of PDCA holds a principle that ends the grading system and giving attention to learning processes than rating processes. The researcher through inspection reports (2014-2019) borrows the theory of performance paradox (Thiel and Leeuw, 2002 in Adam et al. 2019; Meyer and Gupta, 1994 in Lado and Boyd, 2006) to unfold trends in which schools are sometimes rated effective when actually their processes are ineffective. In this connection, such schools celebrate success in terms of outputs than processes and the ultimate outcomes may be rendered unfit for purpose in higher education, let alone the world of work.

Literature highlights that the process approach has the potential to serve education. Notwithstanding the compatibility challenge, Bunglowala and Asthana (2016) argue that applying TQM philosophy to teaching and learning management is a regular and rational technique to particularly assure the effectiveness of learning and teaching processes. Matorera (2018) points to the same logic by maintaining that modern industry-based Quality Management Systems (QMS) like Six Sigma, Total Quality Management and quality function deployment among others have, since the 1980s, become widely used in education. The success was probably judged on the basis of outputs than a competency based framework. A number of studies were reviewed to establish the implementation level and effectiveness of QMS in education through the process approach. For example, the works of Kucińska-Landwójtowicz (2020), Sohel-Uz-Zaman and Anjalin (2016), Levina et al. (2015), Zhang and An (2010) and Bunglowala and Asthana (2016), all show proposals for the TQM model at higher education levels. Farooq et al. (2007) proposal however highlight TQM as a potential paradigm in all educational fields (schools, colleges and universities).

The works of Brown (2013) and Wani and Mehraj (2014), uniquely touch base with the application of TQM at basic education level. Wani and Mehraj (2014) indicate that TQM in education surfaced in 1988 at Mt. Edgcombe High School in Sitka, Alaska when David Langford the schools technology teacher/coordinator, applied total quality concepts in his classes. In support of the TQM initiatives in education, Crawford and Shutler (1999) in Wani and Mehraj (2014) suggest a practical strategy for using TQM principles in education. Their strategy focuses on the quality of teaching system used rather than on students' examination results. Because many education systems are still glued to summative assessments and grading systems, the researcher's view is that for a developing economy like that of Botswana, formative assessment and a competency based model of learning can meet the requirements of the customer. Wani and Mehraj (2014) argue that primary schools, as the basic subsystem of educational super-system, affect upper levels with their outcomes. In this context, TQM efforts at primary schools are fundamentally important to achieve a high quality education system. Generally, the researcher observes a disconnect between systems (basic education and tertiary) and levels (primary, junior secondary and senior secondary) hence gaps within the systems thinking perspective itself. In this regard, the researcher propounds the tracer studies approach as one empirical method to validate the interconnectedness or otherwise of the different basic education levels in terms of performance.

Vlašić et al. (undated) with their study empirically show the link between secondary and higher education in applying the TQM model. In order to assess the efficiency of TQM in education, research was carried out in 60 primary and 30 secondary schools in the Republic of Croatia. The research results showed that by using TQM, educational institutions successfully distributed their accumulated knowledge and increased their efficiency. The Standards for quality management in education in the Republic of Croatia, NUKO 9001:2007 also confirmed the validity of TMQ and assured its application.

The foregoing submissions amply demonstrate that introducing a Quality Management System through a Process-based methodology for continual improvement is practically relevant even in the education sector. It is however observable that scholarly work is mainly skewed towards higher education than basic education on issues of TQM. These studies are predominantly proposals for the model than reflecting actual implementation and as such measurement of the level of effectiveness is not easy to detect. There is need to reorient approaches holistically so that the pursuit for systems thinking and quality thinking is not lost.

Owing its origin to the production industry, the applicability and compatibility of the Process-based approach in service industry is not without challenges since it is relatively new or is at its infancy stage in the educational landscape (Pokoni, 2004; Levina et al. 2015; Sohel-Uz-Zamana and Anjalin, 2016). According to Crosby (1984) in Wani and Mehraj (2014), unless strategy is focused on the quality of the teaching system and improvement, leadership commitment and quality cultures of continuous improvement, the goal of TQM cannot be fulfilled. A strong quality risk management culture drives the policies, practices,

and processes used to accomplish a company's portfolio of work (Richter, 2015). Risk management is infused in the proposed model as informed by inspection reports that such a philosophy lacks maturity in basic education. Svensson and Klefsio (2006) in Wani and Mehraj (2014) point out that TMQ fail because people lack understanding of quality and failure to involve others within the organization. Ali and Zairi (2005) in Wani and Mehraj (2014) attribute failure of TQM in education to poor inputs, poor delivery services, and lack of attention paid to performance standards and measurements, unmotivated staff and neglect of student's skill. Dale, et al. (2007) in Sohel-Uz-Zaman and Anjalin (2016) notice some critical obstacles such as: ineffective leadership; obstruction to change; contradictory policies; inappropriate organizational structure; and poor management of the change process. Kosgei (2014) in Sohel-Uz-Zaman and Anjalin (2016) further detects lack of commitment by the management and some workforce, school's organizational culture, poor documentation, inadequate training of staff, and ineffective communication. Generally, some educators believe that the philosophy which is developed for business may not be appropriate for service organization like educational institutions (Sohel-Uz-Zaman and Anjalin, 2016). Despite a plethora of challenges, Botswana has the potential to implement the model and align with current trends and patterns in education. Research work by Maimela and Monyatsi (2016) confirms this by indicating that the Government of Botswana has consistently allocated over 20% of its budget to education even before the Conference on Education for All of 1990.

Methodology

The paper adopted a mixed research method through the application of both the qualitative and quantitative methods. A descriptive survey method conducted for thirty four (34) senior secondary school heads in Botswana in 2020 using self-completion questionnaires was conducted. Self-completion questionnaires were developed on the basis of key thematic areas. Documentary study was also used by reviewing 2014 – 2019 school inspection reports for 17 secondary schools and literature available. Using a multivariate approach, 2 tracer studies were conducted to track learner performance in the context of systems thinking for the 2013 PSLE results, 2016 JCE results and 2018 BGCSE results, where the cohorts used remained constant.

Research Design

According to Daniel and Berinyuy (2010), a research design provides a framework for the collection and analysis of data. There are five different types of research designs: experimental design; cross-sectional or social survey design; longitudinal design; case study design; and comparative design (Daniel and Berinyuy, 2010). This particular study uses a cross-sectional design which according to Daniel and Bernyuy (2010), entails the collection of data on more than one case and at a single point in time in order to collect a body of quantitative or quantifiable data in connection with two or more variables which are then examined to detect patterns of association. Data was collected on the variables of inputs, outputs, and processes simultaneously using the survey method and two parallel but mutually

connected sets of tracer studies for purposes of objectivity. Document analysis as a qualitative data collection tool was also used to enrich the other methods.

The Population and Sample

The population of this study comprised all the thirty four (34) school heads from public senior secondary schools nationally.

Sampling Technique

All the 34 senior secondary school heads nationally were targeted. The sampling technique was informed by the fact that school heads as leaders of institutions directly provide an oversight role and accountability in the implementation of the process approach for purposes of embedding a quality culture. Senior schools were a target population since they are relatively large institutions with complex processes. Besides sampling done through the survey, the sampling technique was extended to school inspection reports (19 in total, 12 for junior schools and 7 for senior schools) which were randomly selected by the Inspectorate Services Unit at Ministry headquarters level on behalf of the researcher to reduce the element of bias.

Data Collection Instruments

Data was collected from the thirty four (34) senior secondary schools by means of a questionnaire. Due to the vastness of the country, the researcher first contacted respondents telephonically to make arrangements of emailing the questionnaires. This afforded the researcher the opportunity to cover the target population within a short space of time. Nevertheless, Daniel and Bernyuy (2010) are of the view that while a self-completion questionnaire is a useful way of collecting data; it is not without its own challenges particularly low response rate. In this study, 24 out of 34 school heads responded to the questionnaire following many follow ups which could otherwise have resulted in very low response rate. Documentary study was another data collection method used by referring to inspection reports and the review of available scholarly literature. Data for the quantitative aspect of the study was collected using closed-ended questions while qualitatively; open-ended questions were used to accommodate the respondents' opinions.

Data Analysis

According to Maimela and Monyatsi (2016), questionnaires need to be "cleaned" as they arrive by checking whether each questionnaire is properly completed and deciding whether to use the data or discard it. A similar process was adopted in this study after which the researcher coded the questions. Obasi (2008) in Maimela and Monyatsi (2016) maintains that data processing and analysis is where a researcher represents the data collected with appropriate analytic tools already specified and adopted under the methodology. Data from

the tracer studies was analysed, synthesized, interpreted and triangulated (Tabulawa et al. 2013) with the data generated from the survey. In analyzing data, statistical tools such as flow charts, tables and percentages were used. At the end of these tables and flow charts, statistical data was immediately interpreted to show emerging trends and patterns of the input-output educational debate.

Validity & Reliability of Instruments

The questionnaires were pilot tested to establish if they could be able to capture the required data as expected. The test was also conducted to find out whether the questionnaires were easily-understandable or not. Six school heads were approached to answer the questionnaire and all the respondents reported that they had no difficulty in answering the questions. This positive feedback from the respondents confirmed the validity and reliability of the instruments. In essence, the study would later consistently yield the same results with better precision.

Ethical Considerations

The researcher had to seek consent from the sampled population. It was the responsibility of the researcher to ensure that information provided by respondents was treated with strict confidentially without disclosing their identity. The researcher also assured the respondents that no information would be tempered with, that is no modifications would be made to the data other than to appreciate the literature and leave it in situ.

Findings and Discussions

The quest for the process based model – Rhetoric or Reality?

The need for a paradigm shift is perfectly in line with Adewale's (2014) thinking that due to the globalization of education practices, countries cannot afford to remain with the same procedure and practices while others are moving. Education is fundamentally a set of processes and outcomes that are defined qualitatively. ISO 9001, which is a generic model taking a macro look at the relationship between organisation and customer, requires that organisational processes be identified, controlled, analyzed, audited and reviewed (ISO 9001, 2013).

From the survey, all the 24 (100%) school heads interviewed were of the view that schools should develop, document, implement and maintain a standard system for managing quality. This shift in thinking is a welcome gesture for proponents of the process approach in the changing face of educational leadership especially for countries in the transitional phase of education quality. Such possibility thinking (Beghetto, 2018) by the leadership also shows buy in needful for driving new reforms geared towards a culture of continual improvement as espoused by the process paradigmatic approach. The study has also revealed that resources (inputs) such as learning materials and teacher quality are very critical in improving learner

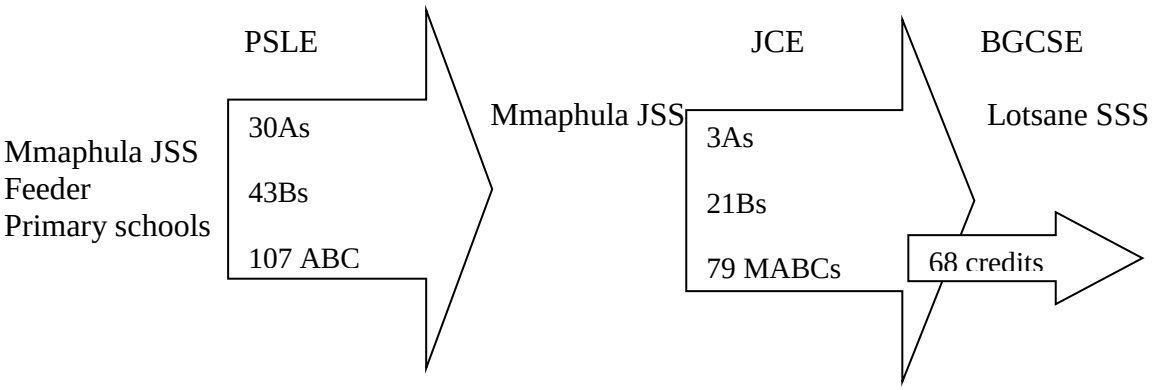
performance as evidenced by 100% of the school heads. It is only correct to conclude that the process based matrix requires a full complement of resources for its effectiveness to be realised hence perceptions by the school heads reaffirm the demands of the proposed model. Furthermore, 95.8% of the school heads confirmed that quality education should put more emphasis on processes and outcomes than output while only 1 school head (4.2%) confirmed otherwise. This further corroborates the logic of implementing the process approach as a reality with provisional inclusion of outputs as informed by quality control in the grading system. It also provides a new dimension to the traditional notion in which the focus was more on inputs and outputs than processes and outcomes as was observed by the work of Tabulawa et a. (2013).

Two tracer studies were conducted in parallel for selected Palapye schools to establish whether different levels within one system continue maintaining standards for continual improvement or not in terms of learner performance. This would assist in appreciating the linkages in systems and processes. The grading system was deliberately picked for the tracer studies since it informs us of the type of learner or worker produced by the system; 'self-programmable', one who constantly redefines his/her skills for a given task or a 'generic' learner/worker; one who acquires his/her skills through 'exploitative learning', associated with a more traditional manufacturing economy (Castells, 1997 in Tabulawa, 2009).

These tracer studies were carried out for results of three different levels in terms of qualification between 2013 and 2018; that is the 2013 Primary School Leaving Examinations (PSLE), 2016 Junior Certificate (JCE) and the 2018 Botswana General Certificate for Secondary Education (BGCSE) where the cohorts used remained constant. The first tracer study which served a quality control purpose, hypothetically tracked learner performance according to level under the assumption that performance would automatically improve as a result of good quality achieved from previous levels. The second tracer study focused on the same levels but with low quality grades from previous levels.

Figure 1: Tracer study 1 – Performing schools according to level and catchment area between 2013 and 2018 (Quality control)

Level	**Year of completion**	**Total ABC/MABC/5Cs or better where "M" = Merit**	**Total candidature**	**% ABC/MABC/5Cs or better**
PSLE	2013	107	107	100%
JCE	2016	78	107	72.9%
BGCSE	2018	68	107	63.6%



Findings from the study were that;

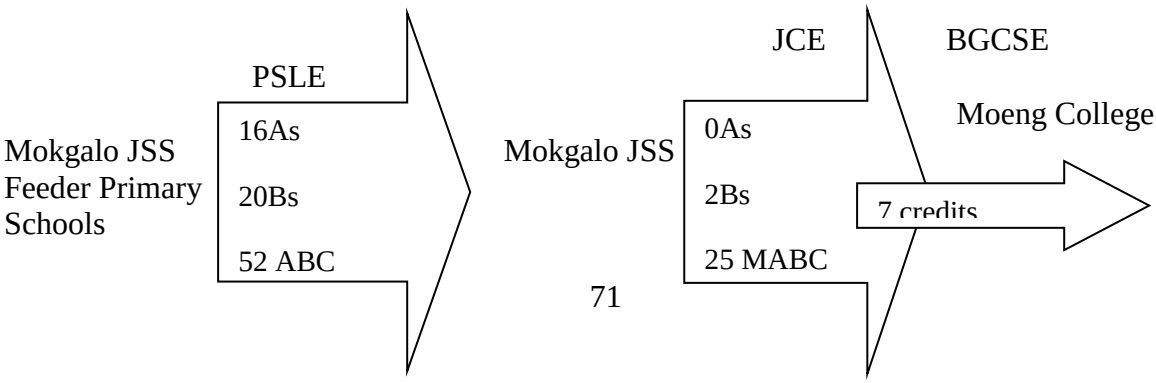
The quality that was produced at PSLE (100%) declined to 72.9% at JCE and further declined to 63.6% at BGCSE level. Findings of ETSSP (2015) also indicate that transition rates from primary to junior secondary are high at 98.5% and from Junior Secondary to Senior Secondary at 52% at national level. The limiting factors here could be attributed to differences in the quality of items and the grading system at each level. This was substantiated by one school head who pointed out that declining trends were due to the fact that;

"Curricular is delivered differently; assessment and grading systems are also different according to level".

An in-depth look at the raw statistical data revealed that a total of 30 As which were produced at primary schools were reduced to 3As at JCE; 43 Bs produced at PSLE were reduced to 21 Bs at JCE; 107 ABC produced at PSLE were reduced to 79 MABCs at JCE which were finally converted into 68 credits at BGCSE level.

Figure 2: Tracer study 2 – Underperforming schools according to level and catchment area between 2013 and 2018

Level	**Year of completion**	**Total ABC/MABC/5Cs or better**	**Total candidature**	**% ABC/MABC/5Cs or better**
PSLE	2013	47	52	90.4%
JCE	2016	25	52	48.1%
BGCSE	2018	7	52	13.5%



Findings from the study were that;

The quality that was produced at PSLE was 90.4% but it declined to 48.1% at JCE and further declined to 13.5% at BGCSE level. Like the first tracer study, possible limitations here could be attributed to issues of cut off points for the number of As used at PSLE which possibly increased the number of false positives.

All the 16 As which were produced at primary schools were reduced to 0 As at JCE; 20 Bs produced at PSLE were reduced to 2 Bs at JCE; 52 ABCs produced at PSLE were reduced to 25 MABC at JCE which were finally converted into 7 credits at BGCSE level.

In summary, the grading system provides a false picture about the learner performance. Learner grades relay a message that there is achievement while in terms of competencies there are deficiencies thus compromising customer requirements. From the survey, 25%) of the respondents indicated that grading and ranking of schools and learners are good measures of quality learning outcomes, which in this sense may only satisfy the immediate intensions than long term intensions of quality. Of the total, 66.7% confirmed the obscurity of grading and ranking in relation to learner achievement standards while 8.3% were uncertain. The overwhelming majority did not subscribe to the grading and ranking system because when asked if these were good measures of quality, one of the school heads argued that;

"Schools get students of varying learning abilities mostly dictated by their environments and socio-economic backgrounds".

"Exams are not outcome based so they do not give a true reflection of achievement of outcomes".

"Each school is should be judged on the basis of its own performance than competing".

The foregoing statements clearly indicate that the school leadership is increasingly realising the need for a process based paradigm shift that recognizes quality to be a function of many factors as well as the need to focus more on outcomes than outputs. The comment on 'each school is should be judged on the basis of its own performance than competing' confirms that grading creates what (Park, 2013) terms 'league tables' which seemingly perpetuate school competitions to score high grades for accountability purposes than achievement of learning outcomes. In this context, formative evaluation than summative evaluation becomes key. In fact, owing to the unfortunate history presented by the grading system, Deming (1991) in Farooq et al. (2007) has come to the conclusion that the TQM philosophy warrants that attention should be given to the learning processes and outcomes rather than the grading and ranking systems. Katz et al. (2001) in what they called, "The Paradox of Classroom Assessment: A Challenge for the 21st Century", similarly argue that;

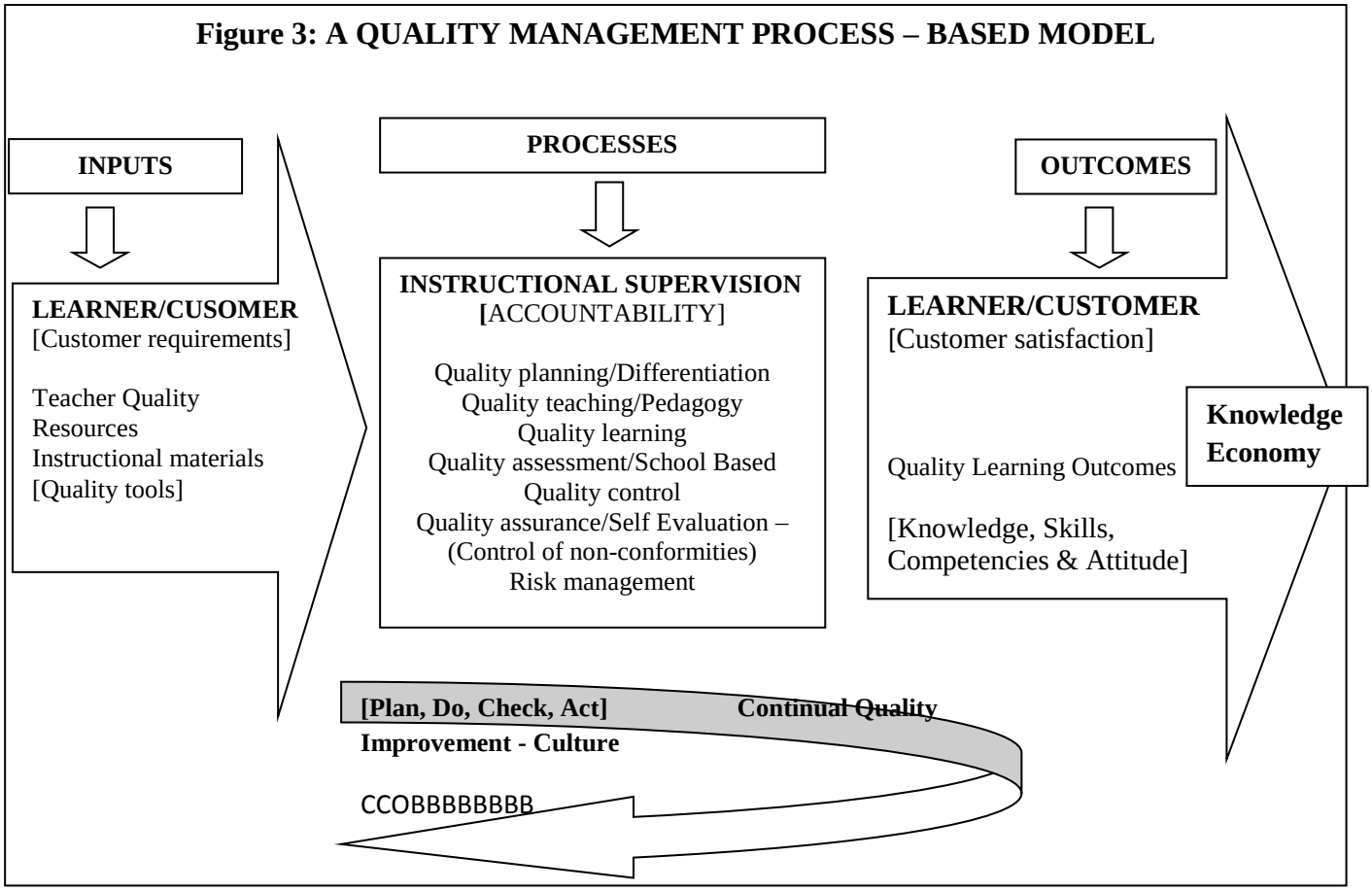
"*Marks really* do *not fit with the thrust of the curriculum…..,* Is *successful 50%, 60%, 80%?That is really, really tough* to *measure".*

From the survey, 95.8% of the respondents indicated that school based assessment will lead to more school accountability and improve learning outcomes while 4.2% was uncertain. As such, learner performance should be tracked over a continuum than being judged on the basis of summative evaluation which presents unintended risks. A fully fledged culture of school based accountability thus needs to be effected. Such should be addressed by the proposed model which takes care of an outcome based education.

Designing the Process-based model

According to the Lead auditor course handbook, ISO 9001 allows each organisation to develop its own unique Quality Management System with more specific requirements that are dependent on its own processes. For this reason, I have decided to develop and customise ISO 9001:2015, ISO 21001:2018 standards and the PDCA model **(Figure. 3)** to conform to the context and requirements of Botswana's basic education system. Following extensive review of literature, inspection reports, results of the survey and the tracer studies, the researcher was convinced that it is possible to apply a quality management system through the process approach to the management of educational activities. Designing a synergetic model was complemented by the researcher's field of orientation as a practising school inspector and the fact that Botswana's inspection framework is technically endowed with quality principles. It is the view of the researcher that not all processes within an educational institution have been identified in this work and it is hoped that this product will probe future analysis by the world of scholarship with keen interest in the sphere of quality systems. The synergetic approach basically provides an answer to Matorera's (2018) scholarly appeal that researchers need to explore the potentials of hybridising quality management models in education. It must be noted though that at the designing stage, outputs were not included in the proposed model as is usually the tendency. This decision was meant to manage emerging contradictions between outputs (grades) and outcomes (competencies) in the midst of a knowledge based economy. It is assumed though that, contextual realities, quality control of the grading system and the level of educational maturity may decide the inclusion of an output based model of education.

Figure 3: A QUALITY MANAGEMENT PROCESS – BASED MODEL



Deconstructing the Process Approach Matrix

The process approach through ISO 21001: 2018 demands that we make an analysis of how a nexus of inputs, outputs, processes and outcomes methodically fit in service industry. Matorera (2018) similarly maintains that the relation among inputs, processes and outcomes is not uncommon in educational management literature. ISO 9001:2008 (2009) in describing the process-based approach highlights that outputs and outcomes as value added end products are a function of inputs (materials) and processes/activities (methods, environment, man and machines) interacting. From the production industry perspective, a factory uses raw materials (inputs) that through managed processes are turned into finished products (outputs) that are completely different from the raw materials used. In other words more value is added to the final product. The same principle is in this paper applied by analogizing the school to a factory industry.

From an educational stance, the learner requires quality inputs (resources/instructional materials, teacher quality). These inputs as per the model will require processes (differentiated quality planning, quality teaching/learner centred methodologies, quality learning/knowledge and competencies, quality assessment, quality control, quality assurance/self-evaluation, and instructional supervision) that will transform them to quality learning outcomes. The outcomes should reflect knowledge, skills, competencies and attitude

that are globally fit for purpose to meet the demands of the global economy. Tabulawa et al. (2013) echo a similar line of thinking when arguing that the learner is an important 'input' for processing into a product very different from the raw material they were initially thus making the learner to be at the centre of the educative process.

Schools' internal processes are usually nested with a multiplicity of risks, hence the need to embed process risk management within the quality management system framework for education. Through risk based thinking, detected non conformities are raised for continual quality improvement. Non conformity according to ISO 19011:2011 (2012), ISO 9001:2008 (2009) and ISO 21001:2018 (2018) is non-fulfilment of a requirement or deviation from set standards of a requirement while conformity is fulfilment of a requirement. In the context of education, a non-conformance can be detected in processes such as lesson planning, teaching methodologies, learning outcomes, assessment procedures, grading processes and supervision.

Implementing a Quality Management System through a process based approach certainly requires some form of quality control to minimize or eliminate detected non-conformances or unintended risks. Thus a clear culture of continual quality improvement and risk based thinking premised on school self-evaluation model of accountability need to be established in schools through the commitment of top management (Wibison, 2019; ISO 21001: 2018). Management of the processes and the system as a whole can be achieved using the Deming cycle (PDCA) with an overall focus on risk-based thinking which is aimed at taking advantage of opportunities and preventing undesirable results (ISO 21001: 2018, 2018). This PDCA model which resonates well with school based accountability is by no means least necessary for managing and driving processes to achieve the desired outcomes.

Conclusion and Recommendations

This study points to the fact that quality thinking and process thinking lack maturity in Botswana's basic education system. Recent studies have shown that while the process-based approach has attracted many debates surrounding its applicability and compatibility in the education sector, the introduction of ISO 21001:2018 perhaps validates the implementation and future of this new paradigm shift. Pokorni (2004) has maintained that the process approach is applicable and useful for all organizations, including educational. The study has evidenced that the process based approach as a Quality Management System methodology presents a complex matrix involving inputs, outputs, processes and outcomes which need to be managed as a system to respond to the demands of the global economy. Because of this anticipated response, the researcher has substituted the outputs from the usual matrix with outcomes. The logic here is that outputs are a function of the grading system which is more output based than outcome based. The works of Sohel and Anjalin (2016) also concedes to the fact that while a Quality Management System has the potential to serve education, it cannot be claimed that implementing the model is not without challenges. Past studies have indicated that each organisation is flexible to develop its own unique system with more specific requirements that are dependent on its own processes and as a result this study

decidedly employed a synergetic methodological framework of the ISO 21001:2018, ISO 9001: 2015 and the PDCA model of TQM.

A new shift in thinking which focuses more on processes and outcomes is critical. The study has also raised non conformities and deficiencies which are inherent in the efficacy of processes to drive educational outcomes. Such non-conformances are evident in planning approaches, pedagogy, learning processes, assessment procedures and supervision processes. This study appreciates efforts made so far through ETSSP and inspection recommendations which subtly provide a new dimension in embracing the process approach. There is positive thinking displayed by the school leadership in terms of how they view a quality management system that introduces the process approach.

An analysis of the whole framework guides us to the conclusion that the process-based approach requires a total quality culture premised on continual quality improvement (Sohel and Anjalin, 2016). The model thus provides the basis for School Self Evaluation as an evolving movement for school improvement and effectiveness. A strong, stable and effective school leadership stays at the heart of this culture of continuous improvement. Parallel to this study, the works of Maphorisa (2019) has demonstrated that school based accountability is lacking in terms of driving internal processes thus compromising on the quality of planning, teaching, learning and assessment standards. Based on the findings, as Matorera (2018) puts it, further work needs to be done to create the conceptual, managerial and behavioural competences that should facilitate the embedment of the quality management models into the daily lives of education institutions.

It is recommended that a Process-Based Quality Management System standard should be developed, documented, implemented and maintained for Botswana's basic education sector to fulfil customer requirements as informed by ISO 21001: 2018. It is further recommended that a school based culture of quality sustained by internal accountability and/ or school self-evaluation should be created in schools with external validation coming through the Inspectorate. It is not uncommon that organizational processes are inherently characterised by risks, as such risk-based thinking should be embedded in the process-based approach since it is lacking in Botswana's education system. The focus of the model should be on inputs, processes and outcomes (competency based framework) with outputs coming in contextually.

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