

Session 4-3

Triangularization of Qualifications Framework, Planning and Quality Assurance

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Abstract

An NQF (National Qualifications Framework) is based on a set of learning domains which specifies the “competencies sets” a student or a graduate should be capable of when s/he completes a course or graduates from a program of study. These learning domains which are important to the students’ performance assessment should be part of the planning of the course curriculum, teaching pedagogy and assessment that should holistically be part of the bigger quality assurance process and planning systems. This would call for the inter-linkages of the 3 systems of: 1) planning system (of the mission and goals of a program), 2) curriculum development system (based on nationally defined Standards of QA NQF to meet market and national needs and quality requirements and assessment of performance based on the Standards 3) information systems for informing on and supporting academic decisions. In practice, issues of NQF being “papers based” and additional work not evidential of quality assurance persists as their linkages to the Quality Management and Planning Management or supported by Information based evidences are weak or non-existent. As such, this paper aims to show the relationships of the NQF and the planning and quality management dimensions and inter-linkages through an online NQF that relates to a set of university indices of students’ performance assessment, teaching and their satisfaction based on the program strategic plan. Educators can recognize that NQF, planning and quality management when managed holistically will support continuous quality improvements.

Introduction

Quality Assurance (QA) practices and systems are more matured in the Western countries and the developed countries in the Asia Pacific than that of the developing countries of Asia and ASEAN (Association of South East Asian Nations), the MENA (Middle East North African) and Latin American countries. These are very diverse in nature in the frameworks or approaches, mechanisms and practices or systems established. These diversities are further complicated by the inherent cultural differences and national education or development agenda of different national authorities that might have overlaps or oversights. Albeit these, most are founded on the basic principles of:

- **Standards and Criteria requirements:** Quality Management alludes to the basic principles of IQA (Internal Quality Assurance) and EQA (External Quality Assurance) of Standards that might range from 8 to 14 “Standards of Good Practices” subscribing to the scopes of Learning and Teaching, Learning and Support Services, Quality Management, Objectives and Planning, Governance and Administration, Research, Student Support Services and Human Resources, Integrity/Ethics, Community Services, Management and Administrative Support, Financial Management and Collaborations and Partnerships and lastly Public Information (Teay, 2012). These 14 Standards are further supported by about 53 “Criteria of Good Practices” like Curriculum Management, Student Progress, Student Assessment, Learning Resources and Academic Staff are ranked top followed by Organizational Structure and Decision Making, Teaching and Learning, Support for Student Learning, Administrative Staff and HR Development coming in second. Coming in third are Review and evaluation and Scholarships, Creative Activities and Achievement and Institutional Governances with a big grouping of fourth ranked criteria as Planning, Management, Information Resources, ICT Resources, Facilities and Equipment followed by those of Institutional and Educational Mission and Objectives, Leadership, Planning and Managing for quality, Feedback System, HR Workforce Planning, Research based teaching and learning, Student Admissions, Student Management, Risk Management, and Research Collaborations (Teay, 2012).
- **PDCA Cycle requirements:** PDCA (Plan, Do, Check and Act) forms the basic pillars of planning management and quality management of quality audit, quality assessment supporting quality assurance that ensures and assures its “Fitness for Purpose”.
- **Evidenced based QA requirements:** The QA mechanism calls for a systematic evidenced based approach in data/information or statistics/performance

indicators or documents support through a systematic approach in information management. These inform on decision making or actions or developmental planning. These should also be supportive of a set of two pronged actions or strategies based on the strategic plan of the institution or school and the recommendations or opportunities for improvements from the annual IQA cycle.

- **Outcome based requirements:** The basic IQA and EQA are supplemented by a vast array of in-depth requirements of which the NQF features prominently. The NQF is a very detailed approach emphasizing the importance of the SLO (Student Learning Outcomes) or outcomes based approach in evaluation and assessment of student achievements. Another requirement that further complicates the quality management is the new trend of the requirements of setting targets in achieving the mission and goals and measurement of these accomplishment and achievements based on the strategic plan. Though required, these were not explicitly or fully developed or aligned with the quality assurance management mechanism.

Though these main requirements form the foundation of successful quality management that is well-intended, but their linkages as a systematic approach in management of these inter-linkages across these requirements are rather weak or non-existent. These requirements were championed by the more matured countries in quality management, but there appears to be very little research into these comprehensive mechanisms or frameworks for maintaining and sustaining quality management. This is a key issue that this paper will try to address and is exemplified by illustrating the inter-linkages of the NQF linkages to planning, quality and information management holistically.

Performance Management in HEI

A HEI (Higher Education Institution), like any other organization has specific processes that support the achievement of its teaching-learning-research missions and contribution to academic and societal development of the community and stakeholders at large. Three fundamental processes (Ashworth, 1999; Childe et al., 1994; CIM-OSA Committee, 1989) contributing to an the HEI's success are: *the operational processes* (that create, produce and deliver on educational value), *the support processes* (that support the operational processes [Garvin, 1998; Porter, 1980]), and *the management processes* (encompassing the goal setting, controlling and organizational behavior processes).

The core processes' efficiencies and effectiveness underlies the imperatives that quality in the HEI must move from a monitoring stance to that of management focused on strategy (Cullen, et al., 2003) that supports management through

measurement (Bourne, et al., 2005). This further highlight the internal context factors which are interactive and inter-linked in nature which are much more complex than the existing simplistic physical and formal systems affecting performance. The performance model of Martz (2001) for a university setting had the principles: to define performance expectations, create attainable but challenging goals, furnish clear measurements, encourage involvement and provide process clarity and feedback.

The rationale of this paper supports Andersen et al.'s (2006) holistic approach of harnessing the various tools and concepts into an overall framework where their inter-linkages are understood when responding to the internal and external challenges. While most of the framework looks at the macro or big picture, Rouse and Putterill (2003) proposed a macro-micro linkage of the: 1) interface between organization and stakeholders, 2) capacity and capability of resources, 3) planning-evaluation and resource-achievement, and 4) the basic core elements of input-activities-output. This approach of moving from the big picture at the organizational level to the operational level is the key determinant of success that supports Franco-Santos et al., (2007), Bernardin et al., (1998), Kennerly and Neely (2002), Harrington (2005), Newkirk-Moore and Bracker (1998), Temporal, (1990) Bolt, (1993), Burach et al., (1997), Tovey, (1991) and Mason, (1993) views of inter-linkages that were not addressed.

Education management had traditionally been viewed through the myopic lens of education fundamentals as opposed to the management fundamentals used in any profit or non-profit organization. The “strategic management or basic management of the organization” is alienated to the conservative views of education. It is important that the conservative education fundamentals be viewed through the strategic management lens to bring out the best of both principles – a marriage of education fundamentals and sound management principles. As a start, education quality is an unquestionable imperative that must be supported with clear evidence or an evidence-based performance management system that are used as the planning parameters. It can be argued that the strategic triangularization of the quality-information-planning domains as expounded here, could lead to better education performance through the creation and delivery of educational value meeting the needs of the stakeholders and society. The HEI basic accountability is through a well-planned and managed systematic approach towards education management. This is illustrated through a unique QMIPS (Quality Management, Information and Planning Systems) of a HEI (Teay, 2008 and 2012) in Thailand that was developed as an initiative towards performance management in a HEI.

Though much had been implemented to ensure these applications accomplishment, a key recurrent issue is the catch-22 dilemma faced by all HEI,

especially in developing countries that are trying to catch up with their developed countries counterparts, is the non-alignment of the IMS (Information Management system), QMS (Quality Management System) and PMS (Planning Management System) as shown in Figure 1.

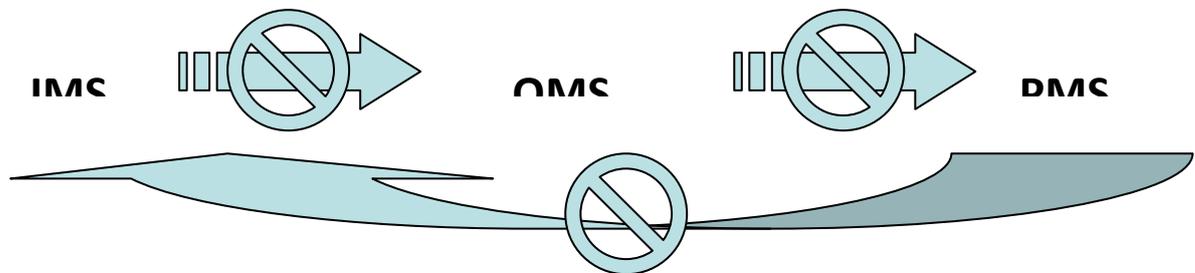


Fig. 1 Non-alignment of the IMS, QMS and PMS

QMIPS (Quality Management, Information and Management Systems) Model

To resolve this key issue, the Teay's (2009 and 2012) "Strategic Performance Management System" An Integrated Framework" recommended the development of a QMIPS (Quality Management, Information and Management Systems) Model (Figure 2). This QMIPS is composed of 3 main systems of the IMS (Information Management System – that defines the statistics, information, data and documentation as evidence or results of the key processes), QMS (Quality Management System – that defines the Standards and Criteria) and PMS (Planning Management System – that defines the Strategic Plan and the OYPB [One Year Plan and Budget]). They are interdependent and interlinked to ensure and assure that quality management is evidence – based informed by the IMS according to the PMS planning dimensions.



Figure 2: Interlinkages of the QMIPS (Quality Management, Information and Management Systems)

- The PMS (Planning Management System)** represents the strategic direction of the HEI specifying its key vision, mission, goals and objectives that are achieved through its strategies. These defines clearly and specifically the strategic direction that the HEI intends to achieve in its 15-years strategic plan supported by its OYPB (One-Year-Plan-Budget) that continuously evolve to achieve its strategic direction. The goals identifies its “what to achieve based on its mission” and the objectives identifies the “what are the measurement of its achievement”. These are defined at all levels of the institution, schools and programs to ensure that all are going in the same strategic direction and its performance are aligned and measured as targeted.
- The IMS (Information Management System)** represents the networks and database system developed to collect, collate, store, process and disseminate key statistics, data, facts, information and documents that forms the base of evidenced based decision making and the performance measurement based on its defined goals and objectives. It is noted that the IMS information and data serves the rotating PDCA concept of Plan – Do – Check – Act that has evolved into the newer ADLI concept of Approach – Deployment – Learning – Integration as expounded in the 2011 MBNQA Education Criteria for Performance Excellence

(NIST, 2011) and discussed below as to its use for evaluating the process and results of the QMS.

- **The QMS (Quality Management System)** which can be based on the MBNQA framework (NIST, 2011) for performance excellence has 2 main areas of Process Criteria and Results Criteria leading to the overall audit and assessment of the performance measurement and management as defined in the PMS. The QMS with its Standards and Criteria acts like a wedge that prevents the HEI's performance from slipping down the slippery slope of continuous improvements. The ADLI (Approach, Deployment, Learning, and Integration) process evaluation factors pushes and leads to its continuous improvements journey up the slope towards its strategic direction based on its plan. The "Process" refers to the methods the HEI uses and for improvements based on the requirements of QMS Standards and Criteria. The four factors used to evaluate the Results Criteria are LeTCI (Level, Trends, Comparisons and Integration) of performance levels which have trend analysis and comparative data while integrated with other results to achieve the mission and goals of the institution, school or program.

National Qualification Frameworks

To illustrate how the QMIPS are interlinked, this paper discusses two similar qualification frameworks from two developing countries of Saudi Arabia and Thailand as illustrations of how the NQF and planning and quality management can be holistically inter-linked through a set of university indices. These indices evaluate the students learning outcomes as specified in the learning domains of the NQF and also inform on the planning and quality management of the program. Technically, there is minimal variant across the two QF under study as the NQF of Saudi Arabia (NCAAA, 2009) has 1) knowledge 2) cognitive skills 3) interpersonal skills and responsibility, 4) communication, information technology and numerical skills, and 5) psychomotor skills, whilst the TQF (Thailand Qualification Framework) (OHEC, 2010) has 5 main domains of 1) Morals and Ethics 2) Knowledge 3) Cognitive Skills 4) Interpersonal Skills and Responsibilities and 5) Numerical Analysis, Communication and Information Technology Skills plus 1 Psychomotor skills.

Since the NQF and TQF are similar in that they have templates, the discussion here is based on the more specific TQF which has: TQF 2 (Program Specification) that includes the domains specifications, curriculum mapping, student evaluation criteria, faculty development and program quality management, TQF 3 (Course Specifications), TQF 5 (Course Report) and TQF 7 (Program Report). It should be noted that TQF 7 is an aggregation of TQF 5, which is based on TQF 3 all of which

meets the TQF 2 specifications. The key issue is that all faculty are “drowned” in the time consuming and tedious “papers documentation” that needs to be prepared, documented and reported every semester for each course taught, all of which leads to the overall program performance. Faculties in both countries face similar issues in the NQF/TQF.

To minimize the time consumed and great efforts in papers documentation and preparation, it is proposed that an online TQF be set up with the main aim of minimizing the manual inputs. A lot of the basic data (once defined) can be extracted from one form to another automatically as they follow a sequential and serial process of TQF 2 → TQF 3 → TQF 5 → TQF 7 all of which leads to the determination of the course performance, program performance and ultimately the school performance. These performances are assessed through the main university indices and survey instruments (Figure 3), as the key SSI of the students, the SCEI and TCEI are evaluated for each course for each term and are reported in TQF 5 for each course and aggregated in TQF 7.

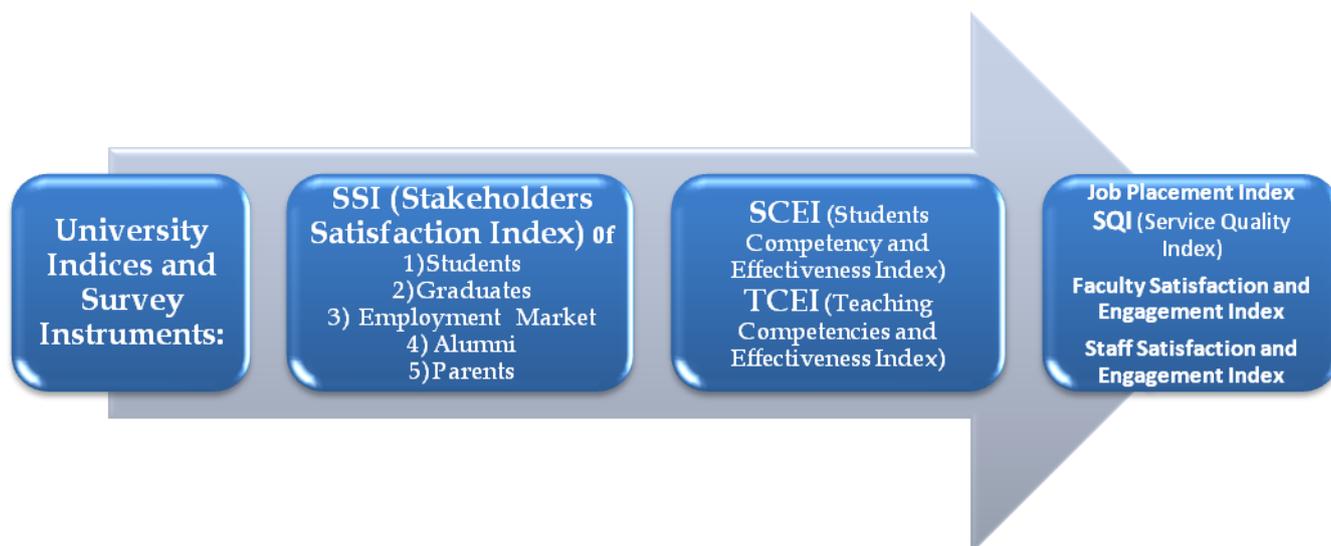


Figure 3: 10 sets of University Indices and Survey Instruments

The above 10 university indices (Figure 3) which were developed as performance metrics of accomplishment and achievement are in compliance with the TQF. The TQF accomplishments are surveyed through a generic set of survey instruments which is a combination of both online (SSI students, graduates, Job Placement, SCEI and TCEI, and Faculty and Staff Satisfaction and Engagements) and manual (SSI employment, alumni and parents) surveys. These represent the core KPI (Key Performance Indicators) that are evaluated as part of the quality management based on the quality Criteria and the accomplishment of the strategic goals as defined in the Strategic Plan.

Based on the QMIPS Model, the inter-linkages of the TQF Indices, Quality Management and Planning are shown in Figure 4. The Indices are assessed under the AuQS 2000 QMIPS

QMS (Teay, 2012) framework and Criteria on Teaching and Learning, Faculty and Staff Development, Stakeholders feedback and engagement, using the international MBNQA Results evaluation approach of LeTCI (Levels, Trends, Comparisons and Integration). The outcomes of the results are reported in the PMR (Performance Management Report) of the PMS to the University Council to ensure that the planned strategic goals under the PMS have been assessed for accomplishment and achievements under the rigorous QMS as informed by the IMS. The IMS provides the “engine” for the statistics, KPI, data and evidences for informing on key decisions that leads to the planning of remedial or developmental actions to achieve the mission.

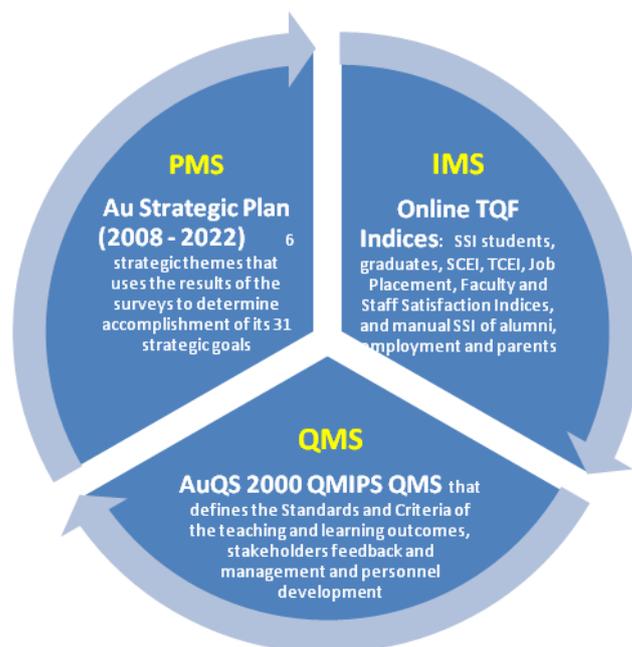


Figure 4: Interlinkages of the Indices of TQF with the QMS and the Strategic goals of the Strategic Plan

Linkages of the Mission, Planning Goals and Indices at all levels

In circumspect, most HEI have an institutional strategic plan that serves as “foci” of the strategic directions that the institutional aspires to accomplish and achieve over a longer term of 10 to 20 years. These are supplemented by annual operation plans and budgets of the schools and administrative units. To ensure getting a piece of the “scare resources” the allocations are normally based on “performance merit” which is normally based on the school’s strategic plan in achieving the overall institutional mission and strategic goals that inherently calls for the alignment of the institution, school and programs mission, goals performance indicators (Figure 5).

An example is shown of a typical ABC University Strategic Plan (2008 – 2022) of which there is 6 strategic themes with 31 strategic goals. The strategic themes normally

revolve around the following key themes which are:

Theme 1: Creating and Strengthening Quality Learning and Teaching

Theme 2: Managing Quality Academic and Research Achievement

Theme 3: Developing Stakeholders-University Engagement

Theme 4: Developing and Managing Resources

Theme 5: Improving Core and Support Processes

Theme 6: Valuing People and Creating a High-Performing Organization

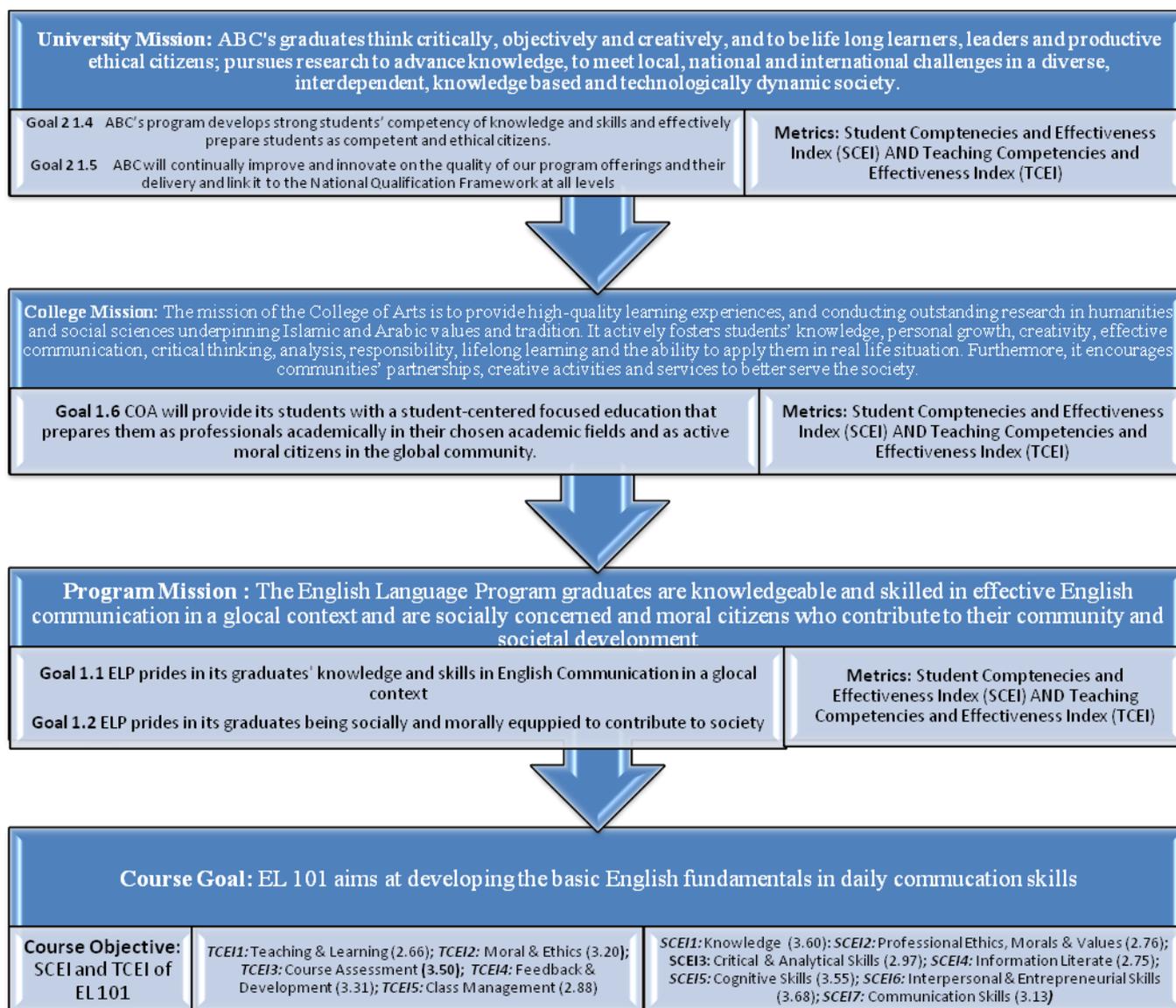


Figure 5: Alignment of the Institution, College, Program and Course Mission and Goal and Indices

To ensure alignment across all levels of operations to measure the performance of a unit, a set of university indices based on the TQF (the SCEI – Student Competencies and Effectiveness Index, TCEI – Teaching Competencies and

Effectiveness Index) and SSI Stakeholders Satisfaction Index (covering the students, employment market, parents, graduates and alumni) were established. These are incorporated in the IMS as part of the university's KPI to assess the accomplishment and achievements of the Strategic Plan's (2008 – 2022) 6 themes. The 3 main key indices of SSI students and SCEI (based on TQF) and TCEI serves to “gauge” the perception of educational value created and delivered to the key stakeholder which is the students' performance. As shown in Figure 5, these indices become the key linkages across the university, school and program missions as they are aligned to ensure top-down cascading of directives and bottom-up accomplishment and achievements based on the mission, and goals of the 3 main institution, school and program levels.

The SCEI deals with the 5 main learning domains of the TQF and the TCEI looks at the more general aspects (Teaching & Learning, Moral & Ethics of instructor, Course Assessment, Feedback & Development, Class Management, Course evaluation). The SSI covers the general satisfaction of aspects that are not covered in the SCEI and TCEI (quality of teaching and learning, student's engagement and involvement and quality curriculum, infrastructures, support services, arts and culture and overall perception of image), all of which drills down to the course level of each student. This can also provide the longitudinal study of a single student or a cohort for Institutional Research for the duration of the whole program of study. All of these informs on quality assurance of the TQF 2, 5 and 7 as all these are automatically posted from the individual student's own performance assessment and assessment of instructor (TQF 5 which is the Course Report), to aggregated and comparative performance of same course by different instructors (comparative studies of performance as institutional research), different courses in program (TQF 7 which is Program Report).

Performance Management: Aggregation, Comparisons and Triangularization

A main test of the program or of a course is whether the student “has attained a certain level of achievement” which is defined in the TQF2 and implemented in TQF 3 and TQF 5 for each course based on the goals and objectives of a course. These are normally evaluated through the use of certain assessment methodologies to achieve the learning domains as defined in the SLO (Student Learning Outcome) which are direct measures. Indirect measures can be the use of survey instruments to determine the “perception” of the stakeholders of the “perceived performance”. These perceived performance are the main aims of the 3 main University Indices of SCEI, TCEI and SSI. Though these might appear to be independent and separate surveys as required of quality management in IQA and EQA, they are powerful tools as

anticipatory indications of “heuristic and psychological behaviour” of the stakeholders. This serves also as a “mirror” of reflections of “what and how the stakeholders see us”.

Table 1: Aggregation and Comparisons of Performance

<i>SCEI SLO Domains of Learning</i>	Individual (EL 101 Section 1)	All individuals (EL 101 Sec. 1)	All sections of EL 101	All courses in Year 1 of Prog.	All courses in whole Program	All Programs in School	All Schools in Institution
<i>SCEI1: Knowledge</i>	3.60	2.57	3.33	3.75	3.88	4.02	4.21
<i>SCEI2: Professional Ethics, Morals & Values</i>	2.76	3.25	2.82	2.75	2.55	2.65	3.24
<i>SCEI3: Critical & Analytical Skills</i>	2.97	2.55	2.75	2.67	2.88	2.74	3.75
<i>SCEI4: Information Literate</i>	2.75	3.25	3.06	2.80	2.77	3.40	3.55
<i>SCEI5: Cognitive Skills</i>	3.55	2.89	3.00	3.11	3.33	3.66	3.95
<i>SCEI6: Interpersonal & Entrepreneurial Skills</i>	3.68	3.55	3.66	3.28	3.55	3.21	3.01
<i>SCEI7: Communication Skills</i>	3.13	3.33	3.88	3.81	4.21	4.11	2.75
<i>Overall Mean of SCEI</i>	3.21	3.01	3.22	3.17	3.25	3.39	3.49

Progression of Level of Aggregation and Comparisons

To look at how the performance can be aggregated and compared across courses within the same subject title, across all the different courses at all levels, Table 1 shows:

- 1) The overall “means” perception of the 7 main domains of a student for a course EL 101 of a student in section 1 (Column 2), an aggregation of all the students in Section 1 (Column 3), and all Sections of the same course EL 101. This shows that the overall mean SCEI across the individual (3.21), all individual (3.01) and all Sections (3.22) do not differ much.
- 2) But looking at a specific learning domain of SCEI 1 (knowledge domain) of an individual (3.60), of all individuals in Section 1 (2.57) and all Sections of EL 101 (3.33), it could indicate that all students in Section 1 has a “gap” when compared with the overall mean of all Sections of EL 101. This could serve as an “early indicator” that can be flagged for more investigation of the “knowledge taught and acquired” in Section 1.
- 3) For “means” perception comparative of all courses in Year 1 of Program (3.17), whole Program (3.25), all programs in School (3.39) and all schools in institution (3.49), they also show some “gaps” in terms of SCEI achievements of the students’ perception of the Year 1 performance of the program which is also lower than that of the institution.

- 4) By the same logic of looking at a specific learning domain of SCEI 1 (knowledge domain), the EL 101 (3.33) does show a “gap” performance as compared to all courses in Year 1 (3.75), all courses in same program (3.88), all programs in school (4.02) and institution (4.21). This could be alarming as there is a “big gap” of perceived knowledge accomplishment and achievement of EL 101 as compared to the aggregated and comparative levels of the Year 1, whole program, all programs in school, and all schools in the institution.

The bottomline is that these indicators of the SLO domains can be used potentially as a tool to “flag” low performance based on comparisons within and across the different levels. This could be taken as a “proactive approach” or use of a “lead indicator” before the final results indicators are out with little recourse to remedial actions of the student’s achievements across his/her 4 years program of study.

To extend on the above approach, a “Relational Framework” shows that the normal SLO domains of learning (Column 2) are normally defined in the SCEI measures and accomplished and achieved through different and various teaching and assessment methodology (Column 1) as (Table 2). At the end of the term, the normal course evaluation can be upgraded as a powerful mechanism of TCEI domains of assessment as exemplified in Column 3.

Though the 3 assessment framework (Column 1), SCEI SLO domains of learning (Column 2) and TCEI domains of assessment (Column 3) may seem independent of each other, they can be mapped together to show a relation across these 3 seemingly different by apparently related assessment variables. In the mapping, these relationships can be “bi-angularized” or “triangularized” to provide a “meta analytical approach” to ensure that the assessment framework achieves certain specific SCEI SLO domains of learning and the teaching accomplishes what it is supposed to accomplish and achieve through the TCEI.

Table 2: Triangularization Framework of Assessment Framework of SLO Domains and SCEI Domains of Learning and TCEI Domains of Assessment

<i>EL 101 Assessment Framework of SLO Domains</i>	<i>SCEI SLO Domains of Learning</i>	<i>TCEI Domains of Assessment</i>
<i>Vocabularies, Grammar and Structure Test (30 %)</i>	SCEI1: Knowledge	TCEI 1: Teaching and Learning
<i>Writing skills through Essays (20 %)</i>	SCEI3: Critical & Analytical Skills	TCEI 1: Teaching and Learning TCEI 3: Course Assessment TCEI 4: Feedback and Development
	SCEI4: Information Literate	TCEI 1: Teaching and Learning TCEI 3: Course Assessment TCEI 4: Feedback and Development
<i>Personal diaries (10 %)</i>	SCEI5: Cognitive Skills	TCEI 1: Teaching and Learning
<i>Presentations (20 %)</i>	SCEI6: Interpersonal & Entrepreneurial Skills	TCEI 1: Teaching and Learning
	SCEI7: Communication Skills	TCEI 1: Teaching and Learning TCEI 3: Course Assessment TCEI 4: Feedback and Development TCEI 5: Class Management
<i>Term Project (20 %)</i>	SCEI2: Professional Ethics, Morals & Values	TCEI 2: Moral and Ethics TCEI 4: Feedback and Development TCEI 5: Class Management
	SCEI3: Critical & Analytical Skills	TCEI 1: Teaching and Learning
	SCEI4: Information Literate	TCEI 1: Teaching and Learning
<i>Overall Mean Score</i>		

Table 3: Bi-angularization of Assessment Framework of SLO Domains and SCEI Domains of Learning

<i>EL 101 Assessment Framework of SLO Domains</i>	<i>SCEI SLO Domains of Learning</i>	Individual (EL 101 Section 1)	Individual Score in Sec. 1	All individuals (EL 101 Sec. 1)	All Individual Score in Sec. 1	All sections of EL 101	All Sections (EL 101)
<i>Vocabularies, Grammar and Structure Test (30 %)</i>	SCEI1: Knowledge	3.60	20/30	2.57	12/30	3.33	18/30
<i>Writing skills through Essays (20 %)</i>	SCEI3: Critical & Analytical Skills	2.97	12/20	2.55	10/20	2.75	12/20
	SCEI4: Information Literate	2.75		3.25		3.06	
<i>Personal diaries (10 %)</i>	SCEI5: Cognitive Skills	3.55	6/10	2.89	5/10	3.00	5/10
<i>Presentations (20 %)</i>	SCEI6: Interpersonal & Entrepreneurial Skills	3.68	15/20	3.55	14/20	3.66	15/20
	SCEI7: Communication Skills	3.13		3.33		3.88	
<i>Term Project (20 %)</i>	SCEI2: Professional Ethics, Morals & Values	2.76	15/20	3.25	12/20	2.82	17/20
	SCEI3: Critical & Analytical Skills	2.97		2.55		2.75	
	SCEI4: Information Literate	2.75		3.25		3.06	
Overall Mean Score		3.21	68/100	3.01	43/100	3.22	67/100

An example of “bi-angularization” of Assessment methodology which are represented by the scores of a test on Vocabulary (Column 1 Assessment Framework and Column 4’s 20/30 score) of an individual for SCEI 1 Knowledge Domain and its “means perception” (Column 2 and 3 – means perception of 3.60) for an individual student in EL 101 Section 1. This shows consistencies of a median 3.60 means perception that correspond to a score of 20/30. This is also consistent with the overall

means (3.33) of all sections of EL 101 and the average score of all Sections of EL 101(18/30). But for section 1, though an individual might do well for the knowledge domain, all students in Section 1 of EL 101 do not accomplish the same as the means (2.57) is consistent with the lower average score of 12/30, it is performing lower than all sections of EL 101. This could be a “lead indicator” that there could be something that needs to be improved in the teaching and assessment methodologies as it is comparatively lower when compared based on the “bi-angularization” analysis.

When the SCEI domains of learning is “bi-angularized” with the TCEI domains of assessment for the SCEI 1 Knowledge domain, it does support the above “lead indication” as the overall SCEI (3.33 in Column 7) and TCEI (3.23 in Column 8) of all sections in EL 101 in Table 4. This is further supported by the bi-angularization of the SCEI (2.57 in Column 5) and TCEI (2.88 in Column 6) of all students in Section 1 of the EL 101 course, as they are in support of the lower performance of Section 1 as compared to all the other Sections for EL 101.

Table 4: Bi-angularization of SCEI Domains of Learning and TCEI Domains of Assessment

<i>SCEI SLO Domains of Learning</i>	<i>TCEI Domains of Assessment</i>	SCEI Individual (EL 101 Section 1)	TCEI Individual (EL 101 Section 1)	SCEI All individuals (EL 101 Sec. 1)	TCEI All individuals (EL 101 Sec. 1)	SCEI All sections of EL 101	TCEI All sections of EL 101
<i>SCEI1: Knowledge</i>	<i>TCEI 1: Teaching and Learning</i>	3.60	3.25	2.57	2.88	3.33	3.23
<i>SCEI3: Critical & Analytical Skills</i>	<i>TCEI 1: Teaching and Learning</i>	2.97	3.25	2.55	2.88	2.75	3.23
	<i>TCEI 3: Course Assessment</i>		3.11		2.78		3.05
	<i>TCEI 4: Feedback and Development</i>		2.88		2.75		3.25
<i>SCEI4: Information Literate</i>	<i>TCEI 1: Teaching and Learning</i>	2.75	3.25	3.25	2.88	3.06	3.23
	<i>TCEI 3: Course</i>		3.11		2.78		3.05

	<i>Assessment</i>						
	TCEI 4: Feedback and		2.88		2.75		3.25
	<i>Development</i>						
<i>SCEI5: Cognitive Skills</i>	TCEI 1: Teaching and	3.55	3.25	2.89	2.88	3.00	3.23
	<i>Learning</i>						
<i>SCEI6: Interpersonal &</i>	TCEI 1: Teaching and	3.68	3.25	3.55	2.88	3.66	3.23
<i>Entrepreneurial Skills</i>	<i>Learning</i>						
<i>SCEI7: Communication</i>	TCEI 1: Teaching and	3.13	3.25	3.33	2.88	3.88	3.23
<i>Skills</i>	<i>Learning</i>						
	TCEI 3: Course		3.11		2.78		3.05
	<i>Assessment</i>						
	TCEI 4: Feedback and		2.88		2.75		3.25
	<i>Development</i>						
	TCEI 5: Class		2.68		3.05		3.11
	<i>Management</i>						
<i>SCEI2: Professional</i>	TCEI 2: Moral and	2.76	2.55	3.25	2.68	2.82	2.91
<i>Ethics, Morals &</i>	<i>Ethics</i>						
<i>Values</i>	TCEI 4: Feedback and		2.88		2.75		3.25
	<i>Development</i>						
	TCEI 5: Class		2.68		3.05		3.11
	<i>Management</i>						
		3.21	3.52	3.01	2.83	3.22	3.11

The separate “bi-angularization” of the assessment methodology and SCEI domains of learning (Table 3) can be combined with the “bi-angularization” of the TCEI domains of assessment and SCEI domains of learning (Table 4) to form a powerful “triangularized meta-analysis” of the student SLO achievement, the teaching evaluation and assessment methodology. This could be done for all of the SLO

domains of learning, assessment methodologies and teaching evaluation for all individuals, all courses, all sections, all programs and all schools.

Discussion and implications

While systems can be developed to accomplish mission of the institution, a key deficiency is the design and development of these systems independently of each other that lacks integration and linkages across the various systems to holistically accomplish the works and achieve the mission and goals of the institution. This is evident in the planning – information – quality management systems and practices linkages that are weak or non-existent. For an evidenced based quality management that is properly planned to achieve the mission and goals with adequate and appropriate statistics, information and documents to inform on decisions, these linkages and integration should not be neglected.

Teay's (2009 and 2012) Strategic Performance Management System using the QMIPS Model is aimed at ensuring the clear linkages of a systematic approach in the planning – information – quality management trilogy. This is achieved by ensuring the:

1. **Alignment of mission and goals at all levels of the institution** – This call for the alignment of the mission and goals of the institutional / school / program at all levels as illustrated in Figure 5. Without a strong alignment, the programs and schools will not subscribe to the singular strategic direction as envisioned by the institution in its strategic plan. This means that the collaborations and systems and practices collectively and holistically subscribing to the “sum of the total” to be more effective than the “sum of the parts” is a key imperative.
2. **Integrated Systems approach** – This is aimed at the integration of the disparate and arrays of systems and practices that are set up to achieve the mission and goals. As noted in the QMIPS Model, the 3 main systems of the IMS – QMS – PMS are inter-locking as one wheel efficiently and effectively turn the others. If separated as “silos” of practices, the success of the quality management in a well-planned and well informed systematic approach will be undermined resulting in under performance or mediocre performance.
3. **Mission and goals governing quality management practices** – A frequent oversight is the importance of the mission and goals which are misunderstood and misused. The mission **normally** defines “the reason for the existence” of the institution, school or program and must clearly define “what it can do and will do based on its capabilities and capacities”. A key example is the outcome characteristics of a student of a program that defines the outcome achievements of a student or graduate which are then translated into the SLO in a the program

and of all the courses to ensure that they are developed and built in progression from level 1 to more advanced levels in a 4 years program of studies. This means that the program and course SLO (which are governed by the NQF) are ultimately derived from the mission and goals of the program that are aligned with the school and institution. This also means that the assessment methodologies are dependent on the type of SLO being assessed. This inadvertently shows that the quality practices of the teaching – learning mechanisms, its formative and summative assessment methodologies that are based on the SLO governed by the NQF are planned as envisioned in the mission and goals. The assessment based on the SCEI, TCEI and SSI or the scores of the course attained is based on the definition and determination of the SLO accomplishment. Though not explicit, it is implicit that the planning – information – quality dimensions are inter-linked and should not be ignored but accentuated to bring about a well-planned, well-informed performance assessment affecting quality.

4. **Bi-angularization and Triangularization of performance metrics linked to planning and quality management** – Though most programs or courses approach the NQF as a “burden to meet requirements”, the NQF when linked to quality and planning management serves as a powerful mechanism to determine performance. This is based on measuring its planned performance outcome to ensure that the quality practices of its assessment methodology achieve what it is intended to achieve as planned. This means that these mechanisms must “do what they are supposed to do”, “measure what they are supposed to measure” and “achieve what they are supposed to achieve” which is the foundation of the quality definition of “Fit for Purpose”. These are exemplified in the discussion of the bi-angularization and triangularization for a meta-analysis of its performance as illustrated in Tables 1 to 4.

The above shows that the information – quality – planning trilogy in the QMIPS Model is a very powerful mechanism that can be used to consolidate a stronger foundation of the interdependence of systems at the strategic level of planning management, information management and quality management. At the operational level, seemingly un-related or related applications, as shown in the SLO domains of the NQF system, are linked to the planning dimensions through its mission and goals, while its teaching and assessment methodologies are based on these planned SLO. The accomplishment and achievement of these SLO, teaching and assessment methodologies, its mission and goals are through the university indices of the SCEI, TCEI and SSI that informs on the performance at the course, program, schools and institution. This inherently shows that a NQF can be linked to the planning dimension,

implemented and assessed for achievements through the quality system and informed by the information system at all levels of the institution. The implications are:

1. A well-planned and well-informed program based on its information-quality-planning inter-linkages can bring about a better planned and managed program. This is supported by substantial integrated and inter-linked performance metrics as measurement of performance in a systematically planned and managed approach.
2. Good and appropriate performance metrics should be derived and built from its mission and goals as these are statistics or performance indicators or evidence substantiating the mission and goals accomplishment and achievements.
3. The performance metrics, when bi-angulated or triangulated based on a two-points or a three-point meta-analysis can provide a rich data source of the meta-analysis of the evaluation and assessment performance metrics and approach. If the two-point or three-point performance data showing a small gap difference and go in the same direction with minimal variance, it can be alluded that they can serve as acceptable and validated performance of the student or an issue through the use of difference measures. If the two-point or three-point performance data show a big gap difference, it is a cause for alarm that needs further research into.

Conclusion

In conclusion, this inherently shows that a well-planned and well-informed systemic approach in education management in a HEI via the management of the information – quality – planning trilogy in the QMIPS Model will be of benefits to the HEI as opposed to a disjointed approach or piece meal management that exist in most institutions. The use of the IMS online surveys of SSI students, graduates, job placement, all of which are governed by the TQF at course and program levels, faculty and staff satisfaction and engagement (internal stakeholders) and the manual surveys of SSI employment market, parents and alumni (external stakeholders) are key inputs that links directly to the quality management. When statistically evaluated under the IMS (Information Management System) using the Standards and Criteria requirements of the QMS (Quality Management System), the performance outcomes are reported in the PMR (Performance Management Report) under the PMS (Planning Management System). These show that the the IMS – QMS – PMS linkages of QMIPS model can be a transparent, rigorous but robust model that can be used to ensure that the NQF can be integrated into the quality management and strategic performance management system of the university.

Reference

- Andersen, B., Henriksen, B., and Aarseth, W. (2006), Holistic performance management: an integrated framework, *International Journal of Productivity and Performance Management*, Vol. 55, No. 1, pp. 61 – 78.
- Ashworth, G. (1999), Delivering Shareholder Value through Integrated Performance Management, *Financial Times*, Prentice Hall, London, pp. 130.
- Assumption University (2008), *AU Strategic Plan (2008 – 2022)*, Assumption University Digital Press, Bangkok, Thailand
- Bernardin, H.J., Hagan, C.M., Kane, J.S. and Villanova, P. (1998), Effective performance management: A focus on precision, customers and situational constraints, *Performance appraisal: State of the art in practice*, Jossey-Bass Inc., San Francisco, CA, pp. 3 – 48.
- Bolt, J. (1993), Achieving the CEO's agenda; education for executives, *Management Review*, pp. 44 – 49.
- Bourne, M., Kennerly, M. and Franco-Santos, M. (2005), Managing through measures: a study of impact on performance, *Journal of Manufacturing Technology*, Vol. 16, No. 4, pp. 373 – 395.
- Burach, E. et al. (1997), The new management development paradigm, *Human Resource Planning*, Vol. 20, No. 1, pp. 14 – 21.
- Chide, S.J., Maull, R.S. and Bennett, J. (1994), Frameworks for understanding business re-engineering, *International Journal of Operations and Production Management*, Vol. 14, No. 12, pp. 22 – 34.
- CIM-OSA Standards Committee, (1989), *CIM-OSA Reference Architecture*, AMICE ESPRIT, Brussels.
- Cullen, J., Joyce, J., Hassal, T. and Broadbent, M. (2003), Quality in higher education: moving from monitoring to management, *Quality Assurance in Education*, Vol. 11, No.1, pp. 5 – 14.
- Franco-Santos, M., Kennerly, M., Michelli, P., Martinez, V., Mason, S., Marr, B., Gray, D., and Neely, A. (2007), Towards a definition of a business performance measurement system, *International Journal of Operations and Production Management*, Vol. 27, No. 3, pp. 784 – 801.
- Garvin, D.A. (1998), The Processes of organization and management, *Sloan Management Review*, Vol. 39, No. 4, pp. 33 – 50.
- Harrington, H.J. (2005), *The five pillars of organizational excellence*, *Handbook of Business Strategy*, Emerald Group Publishing Ltd., pp. 107 – 114.
- Keenerly, M. and Neely, A. (2002), A framework of the factors affecting the evolution of performance measurement systems, *International Journal of Operations and Production Management*, Vol. 22, No. 11, pp. 1222 – 1245.

- Mason, A. (1993), *Management training in Medium sized UK Business organizations*, Harbridge Consulting Group, London.
- Martz, B. (2001), Applying a standard performance model to a university setting, *Business Process Management*, Vol. 7, No.2, pp. 100 – 112.
- National Institute of Standards and Technology (NIST) (2011), *2011 - 2012 Education Criteria for Performance Excellence*, Malcolm Baldrige National Quality Program, National Institute of Standards and Technology, United States, 2011.
- NCAAA (2009), *NQF National Qualifications Framework for Higher Education in the Kingdom of Saudi Arabia*, National Commission for Academic Accreditation and Assessment, Kingdom of Saudi Arabia
- Newkirk-Moore, S. and Bracker, J. (1998), Strategic Management training and commitment to planning: critical partners in stimulating firm performance, *International Journal of Training and Development*, Vol. 2, No. 2, pp. 82 – 90.
- OHEC (2010), *TQF Thailand Qualification Framework*, Office of Higher Education Commission, Ministry of Education, Kingdom of Thailand
- Porter, M.E. (1980), *Competitive Strategy*, Free Press, New York, NY.
- Rouse P. and Putterill M., (2003), Predicting Performance, *Special Issue: Business Performance Measurement and Management*, Volume 41, Number 8. pp. 806-816(11)
- Teay, Shawyun, (2008), Strategic Triangularization of Quality-Information-Planning System for Higher Education Institute Performance Management, 6th International Conference on Education and Information Systems, Technologies and Applications: EISTA 2008, International Institute of Informatics and Systemics, Orlando, Florida, 29th June – 2nd July 2008
- Teay, S. (2012), *AuQS 2000 QMIPS QMS – Quality Management System for Academic units* (8th Edition, 2012), AU Digital Press, Bangkok.
- Teay, Shawyun (2012), *Strategic Performance Management System: An Integrated Framework*, (4th Edition, January 2012), Assumption University Digital Press, Bangkok, Thailand. ISBN: 978-974-615-297-6
- Teay, Shawyun (2012), Commonalities in Diversity, Proceedings in APQN 2012 Conference in Siem Reap, Cambodia from 28th February to 2nd March 2012.
- Teay, S (2008), *Integrated QMIPS (Quality Management, Information and Planning Systems)*, (2nd Edition, 2008), Assumption University Digital Press, Bangkok, Thailand
- Temporal, P. (1990), Linking management development to the corporate future – the role of the professional, *Journal of Management Development*, Vol. 9, No. 5.

- Tovey, L. (1991), *Management Training and Development in Large UK Business Organizations*, Harbridge Consulting Group, London.