
Sub-Theme1: Quality Assurance for Enhancement

The Quality Improvement System (QIS)
A Web-based Quality Improvement Solution for a Distributed Campus System

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ABSTRACT: Continuous quality improvement in any higher education institution (HIE) relies very much on a quality framework that is consistent with international standards and embraced by every person in the organization. However, Quality Improvement (QI)¹ approaches are only as good as the systems put in place to support and monitor their implementation and the willingness of those tasked with improvement processes to engage with both the framework and the systems put in place. This is made more difficult if the institution is composed of a number of campuses which serve communities that are geographically distributed across a country which can affect both commitment to the framework and consistency of practices.

INTRODUCTION

The Higher Colleges of Technology (HCT) is one of three federally funded HIE's in the United Arab Emirates. The Quality Improvement System (QIS) was developed out of a need to provide a user-friendly web-based system that would address the geographical, logistical and organizational challenges associated with program and institutional quality improvement across a college system of 16 campuses. It is based on a framework of performance indicators which are used within a Balanced Scorecard strategic planning structure. Information from the central student management database system (Banner) is integrated with data collected from ancillary systems including enterprise electronic survey and business intelligence applications. QIS then presents data in a format that can be readily used by academic and non-academic leaders to support decision-making tasks in the area of quality improvement and strategic planning.

A BRIEF INSTITUTIONAL HISTORY

HCT was founded in 1988 with four campuses in the Abu Dhabi emirate (two Men's and two Women's Colleges). Since that time HCT has grown to a total of 16 campuses across five of the seven UAE emirates offering a total of 82 programs spanning credentials ranging from Masters through Bachelors, Higher Diplomas and Advanced Diplomas to Diplomas.

In 2003, the decision was made to pursue international institutional accreditation. While academic program improvement and international program accreditation had been an ongoing imperative of the HCT's academic approach, this decision had obvious implications for the standard of QI that had to be undertaken, maintained and demonstrated to external accreditation agencies.

The rapid growth that HCT underwent during its relatively brief history lead, inevitably, to a number of "growing pains":

- Academic QI was split due to the geographically distributed nature of HCT – curriculum development was carried out centrally at HCT, but the delivery of courses and, hence, programs were the responsibility of individual campuses. This created some dilemmas as to where the responsibility lay for QI and/or how the task should be divided.
- Academic QI processes were not consistent across programs or divisions - Academic divisions² and campuses went about QI processes in ways which seemed most appropriate to their needs and situation. This meant that there were no consistent QI processes across the organization.

- No coordinated processes for non-academic QI (provision of services, etc.) - As the emphasis for QI was on the academic side, there were few system-wide QI processes for non-academic service areas such as student services, library, facilities, IT infrastructure, etc.
- Lack of communication or poor communication sometimes lead to gaps or duplication of efforts - due to the size and geographical distribution of HCT, communication was not always effective. This often led to misunderstandings or misinterpretations about how QI was to be carried out.
- An emphasis on and resource allocation towards data collection rather than data analysis & interpretation – data was being collected but very little information resulted - Each division and campus was expected to collect data which could be used to improve programs and processes. However, a lack of expertise in the area of data collection and processing methods lead to an emphasis being placed on data collection as this was a task that could be easily demonstrated. This activity consumed disproportionate resources. Data analysis was often poorly done if done at all. This resulted in a large quantity of data, sometimes of dubious validity, but very little information which would inform the QI process.
- Difficulty in identifying areas in need of improvement - As a result of the data collection and analysis predicament it was difficult to identify areas that needed to be improved.
- Loss of organizational QI continuity - Overall, this led to a breakdown in organizational QI continuity. It was obvious that steps had to be taken to get QI back on track.

These challenges clearly had to be addressed if HCT was to ensure that QI became an effective and integral component of organizational strategy and, in so doing, meet the requirements of both institutional and program-based accreditation.

A POSSIBLE SOLUTION

After examining the existing QI status at HCT, a system-wide committee, the Quality Improvement Advisor Committee (QIAC), made a number of recommendations to the Policy Council of HCT:

- Implement a QI Framework using agreed performance-based indicators (see Appendix 1) - This would ensure a consistent, system-wide quantitative approach that would give both campuses and divisions clearer direction in their QI work. While qualitative data certainly has an important place in QI work, it does not, generally, provide the means to examine data longitudinally which is often a key accreditation requirement.
- Develop a web-based QI environment which would convert data into useful information that would meet both internal and external QI demands - HCT has made significant investments in technology. The use of a web-based QI solution that could draw together disparate sources of existing data would make use of an extensive infrastructure already in place. It was important, though, to create an environment which was easy to use and supported real improvement rather than create meaningless busy work.
 - Utilization of the databases already available - Much data was already available in HCT databases. Existing institution administration solutions such as Banner and other databases were, however, not being effectively leveraged for QI purposes. Merging and presenting this data in a more coherent manner would support more constructive utilization.
 - Inform and engage all stakeholders in QI processes - historically, QI work had been done in HCT by Chairs and Deans while faculty, staff and students often played little if any part. The inclusion of all stakeholders was seen as a significant factor in implementing long-term QI. To that end, a number of “roadshows” were planned as part of the launch of QIS to inform and engage a wider QI audience

FITTING EVERYTHING TOGETHER

The Deming or Shewhart Plan/Do/Check/Act (PDCA) cycle of Quality Improvement describes an iterative quality improvement cycle. The “Check” stage is where data needs to be collected to see whether or not the QI plan is working. As set out above, this part of the process was not taking place smoothly at HCT with the result that QI was somewhat haphazard.

A great deal of data already existed in HCT databases. The main databases for HCT were:

- The Banner³ Institution Administration suite
- The Curriculum Management System (CMS): an in-house application used to develop curriculum and then disseminate course information to faculty
- Electronic Feedback Management (EFM)⁴: an online survey tool used to gather opinions from stakeholders

Banner is an industry standard suite of applications used to manage student, course, program, HR and finance data in higher education. However, while Banner gets better with each new version, it remains a rather clunky application. HCT, therefore, acquired an additional Business Intelligence application (BOXI⁵) which extracts Banner data (and any other data for that matter) and presents it in more comprehensible dashboard formats. These, then, represented the key sources of data needed by those tasked with QI work at HCT. These sources, however, were still unconnected pools of data with little QI context. The purpose of the Quality Improvement System was to synthesize all of this data within the context of a QI Framework of performance indicators. This can then be introduced into the QI cycle so that informed decisions can be made and appropriate actions taken to ensure continuous quality improvement.

Diagram 1 shows how QIS acts as an interface between the sources of data at HCT and the PDCA QI cycle.

WHAT “ADDED VALUE” WILL QIS OFFER HCT?

The purpose of QIS was to solve most, if not all, of the problems listed previously. QIS addresses these problems in the following ways:

- QIS provides a single web-based QI environment HCT-wide - Instead of users having to access data from multiple sources, QIS provided a single point of entry where much of the data collection had already been done. The resulting information was also presented in an appropriate QI context rather than being disconnected chunks of data.
- The QI Framework affords consistent, agreed processes and data representation HCT-wide - not only does QIS collect all this data together in one place, it also processes and presents it in an agreed and consistent manner.

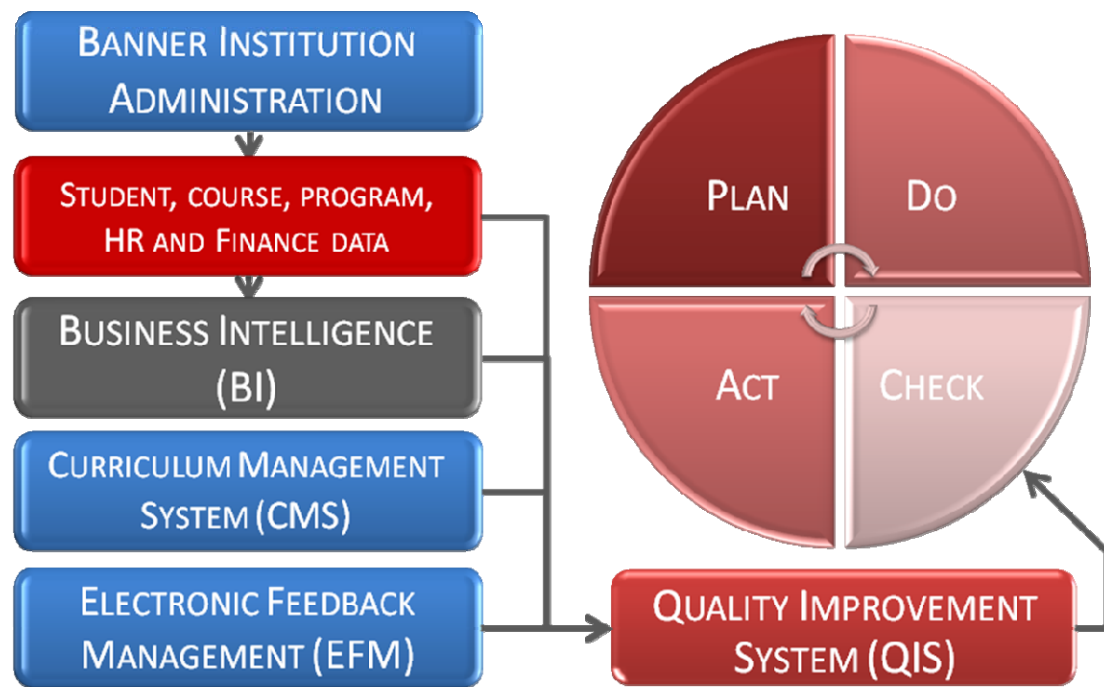


Diagram 1: The Quality Improvement System (QIS) draws together data from various existing sources and presents this in a format which informs the “Check” stage of the PDCA cycle allowing informed, data-driven decisions to be made in the “Act” stage

- Non-academic QI is now included within the framework
- QIS makes QI efforts more visible to all stakeholders - as all HCT staff now have access to QIS, a much wider audience is now included.
- Centralized data collection leaves more time for local data analysis - by making use of existing data or collecting it centrally, users are given more time to concentrate on the more critical aspect of data analysis.

It is anticipated that QIS will deliver the following benefits:

- Collaboration and Transparency: much wider inclusion of stakeholders and transparency of process
- Organizational alignment: which links operational units both vertically and horizontally
- Simplification of Data-driven Decisions: informed choices can be made based on consistent and easy to understand data
- Flexibility: ensuring organizational continuity and integrity while still providing individual campus autonomy

TECHNOLOGY AND DEVELOPMENT

QIS was developed in-house commencing in May 2007 based on ASP.NET technology. It uses an Oracle 10g database backend which imports data from other databases via database links. It is anticipated that some data importation will use web services in the future.

A team of one fulltime and 3 part-time developer/programmers have worked on the project. The development has been carried out on a rolling basis with new modules being tested and then released to the live application as they were completed. Testing has been undertaken by Quality Assurance Coordinators at each of the HCT campuses together with a group of volunteer Chairs and faculty. This group identified bugs and/or suggested enhancements which were then addressed by the developers.

CONCLUSION

QIS will be a “work in progress” for some time to come. Early anecdotal feedback from users has been positive with all campuses engaging in QI during the first full semester of implementation (Semester 2 of the 2007-08 academic year). The 2008-09 academic year marks the first time that all HCT staff have access to the application and the first time that the full use of the BI application will be made.

Likely future QIS developments include:

- Stakeholder needs-based reporting;
- Incorporation of world-standard quality models (some campuses are currently piloting some of these – namely, the Baldrige Quality Award, EFQM and the ISO 9002 standard);
- Staff performance evaluation module;
- External reviewer access (government departments, accreditation agencies, etc.).

QIS itself must undergo a process of evaluation and improvement so formal feedback from users will soon be sought to inform this process.

Appendix 1

QUALITY IMPROVEMENT (QI) FRAMEWORK	
Quality Improvement Areas (QIA's) and Performance Indicators (PI's)	
QIA 1. Stakeholder Satisfaction	
PI 1.1	Employer/Industry satisfaction with Program
PI 1.2	Student satisfaction with Teaching & Learning
PI 1.3	Student satisfaction with Program
PI 1.4	Graduate satisfaction with Program
PI 1.5	Student and Staff satisfaction with Campus Services
QIA 2. Program Design, Benchmarking and Accreditation	
PI 2.1	External Accreditation of Programs
PI 2.2	External Benchmarking of Program
PI 2.3	Program Design
QIA 3. Course Design & Delivery	
PI 3.1	Evaluation of Courses by Students
PI 3.2	Evaluation of Courses by Faculty
PI 3.3	Alignment of Courses with HCT Model
PI 3.4	Alignment of Course Assessment with HCT Model
PI 3.5	Alignment of Key Common Assessments with HCT Model
QIA 4. Student Performance, Retention and Progression	
PI 4.1	Student Performance in Courses
PI 4.2	Student Retention
PI 4.3	Student Progression
QIA 5. Utilization of Resources	
PI 5.1	Alignment of Employee Qualifications with Credential
PI 5.2	Faculty Attrition Rate
PI 5.3	Teaching Workload
PI 5.4	Section Size and Teaching Ratio
PI 5.5	Utilization of Physical Teaching Facilities

NOTES

¹ The term “quality improvement” (QI) will be used throughout this paper in place of the more common “quality assurance” (QA). The notion of quality achievement in Higher Education as a process which is continuous presents a positive and realistic perspective when compared with the approach of attempting to meet and maintain minimum requirements.

² The term “division” is used in HCT in much the same way as “faculty”, “school” or “college” is used in HE systems elsewhere in the world. HCT is comprised of 7 academic divisions: Applied Communications, Business, Education, Engineering, General Education, Health Sciences and Information Technology

³ Banner is a product of Sungard Higher Education.

⁴ EFM is a product of the Vovici Corporation

⁵ BOXI (Business Objects Xtreme Intelligence) is a product of Business Objects SA.