Subject	Maintaining Quality within the Institution
Module	The Quality Cycle: Evaluating and Improving
Topic	3.4 Monitor

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1. Introduction

Monitoring is another aspect of Evaluation which differs from Review in most ways. It tends to be short-term – meaning that real-time reports on some variables are available and change by the second; other variables may generate daily reports and others semester or yearly reports. Monitoring is generally undertaken by internal staff for formative purposes (at the end of this module there is a comparison and discussion of review versus monitoring).

This topic discusses the processes for monitoring in association with the growth of Business Intelligence systems and data warehousing. It also provides a summary to differentiate between review and monitoring.

Objectives: Monitoring

Upon completion of this topic, you should be able to

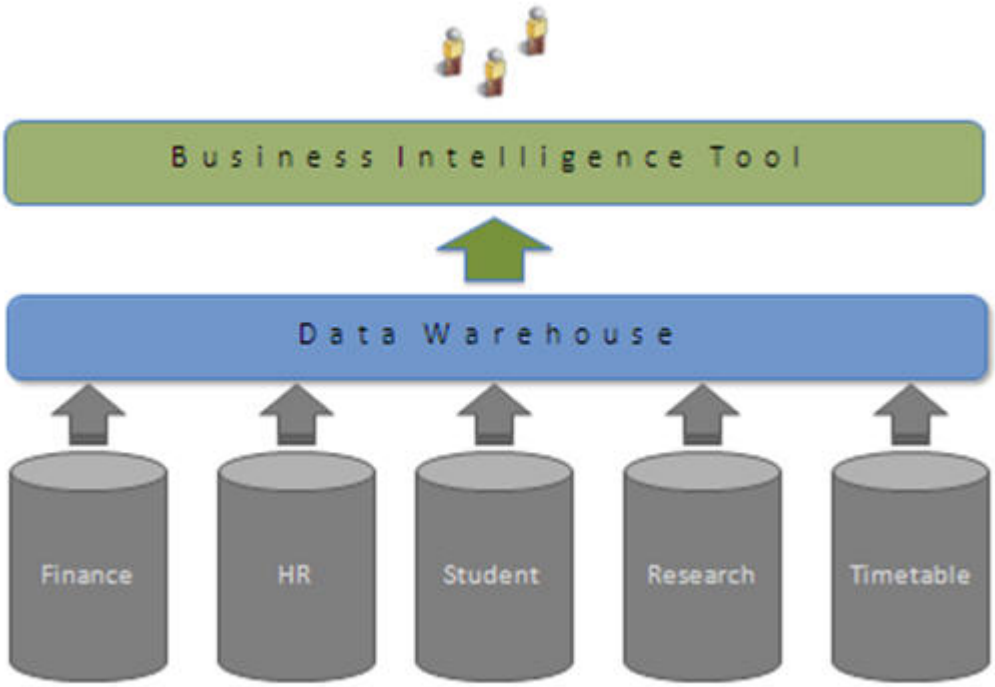
- describe the implementation of business intelligence systems and data warehousing in the process for monitoring the important reporting areas for quality assurance
- identify the differences between review and monitoring

2. Monitoring

Monitoring is a growth area for institutional quality encouraged by a rapidly increasing capacity to produce fast, detailed and linked information, associated with the development of Business Intelligence Systems. A major topic in their own right, the basics of a full implementation of Business Intelligence is the creation of a Data Warehouse through which formerly un-linked Data Bases (such as Finance, HR, Student, Course etc data) can be stored in a form which allows for mutual and easy access and reporting. Formerly, these independent systems were not linked or mutually accessible and so comparison and reporting had to be undertaken manually.

Business Intelligence software sits above a Data Warehouse and allows reporting through easy to use and easy to interpret tables, graphs and other reports.

Institutions that have implemented a complete Data Warehouse have the opportunity to gain the full benefit of a Business Intelligence system. This represents what can be a considerable investment, however and other institutions have chosen to implement Business Intelligence systems without investing in a Data Warehouse, by developing 'work arounds' to link each independent Database into the Business Intelligence reporting software. Again, this does not provide the full power and potential for the future of the Data Warehouse but allows some functionality at a lesser cost. A representation of the full implementation is illustrated below.



Implementation of Business Intelligence Tool with Data Warehouse.

Business Intelligence reporting makes its strongest contribution when it produces real-time reporting (i.e. changing by the second) usually on important business related variables such as student inquiries and recruitment, admission, enrolment, load and financials – increasingly in the form of an 'Executive Dashboard' of automatically updated and real-time key information. In the teaching and learning area, three reporting areas will be considered as becoming commonly used for quality purposes (with one of these being an example of real-time reporting): the monitoring of units (subjects); courses (programs) and retention (which is the example of real-time reporting). It is likely in future that measurement of more learning and teaching variables will come into play and merge with the growing field of Learning Informatics (see Module 4, External Reference: Benchmarking and Quality Agency Audit).

3. Unit Monitoring

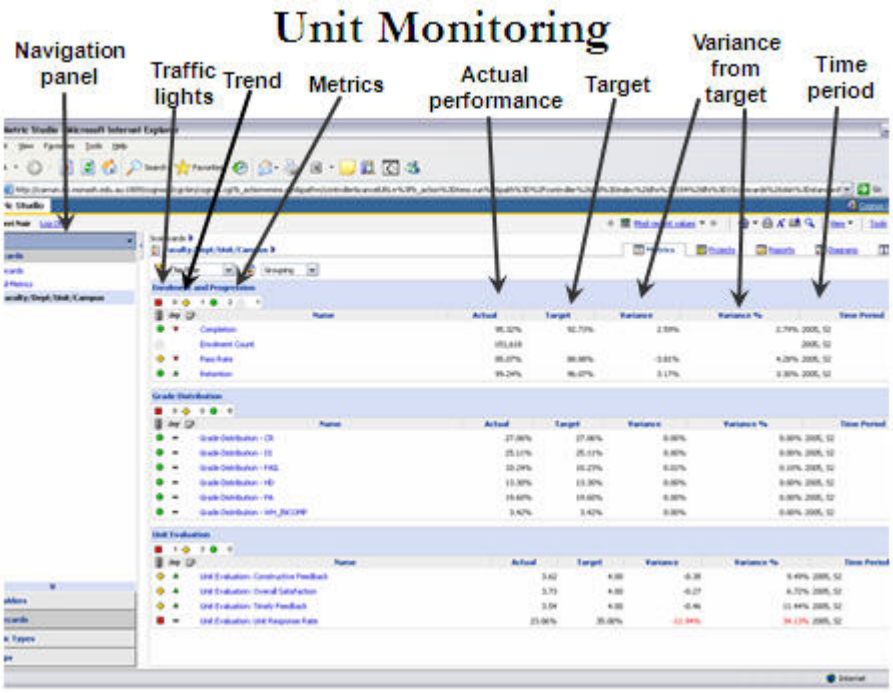
Some measures of units have been available for a long period and can be powerful quality improvement mechanisms in their own right. For example, the voluminous research literature on student evaluation of teaching and units has been developed over the last 40 years and supports the robust validity and reliability of well-

conceived survey items (see for example, Marsh and Roche's (1997) Making Students' Evaluations of Teaching Effectiveness Effective. The Critical Issues of Validity, Bias, and Utility. American Psychologist Nov 1997 pp 1187 - 1197.)

Items commonly used for student evaluation of units and based on the research literature are as follows:

- The learning objectives of this unit were made clear to me.
- The unit enabled me to achieve its learning objectives.
- I found the unit to be intellectually stimulating.
- I found the resources provided for the unit to be helpful.
- I received constructive feedback on my work.
- The feedback I received was provided in time to help me improve.
- The overall amount of work required of me for this unit was appropriate.
- Overall I was satisfied with the quality of this unit.

In the Improvement section of this Module, institutional improvement gained from the use of student evaluation of unit data alone will be illustrated. However, the real power of Unit Monitoring comes into play when more variables are added to this measure, as illustrated below.



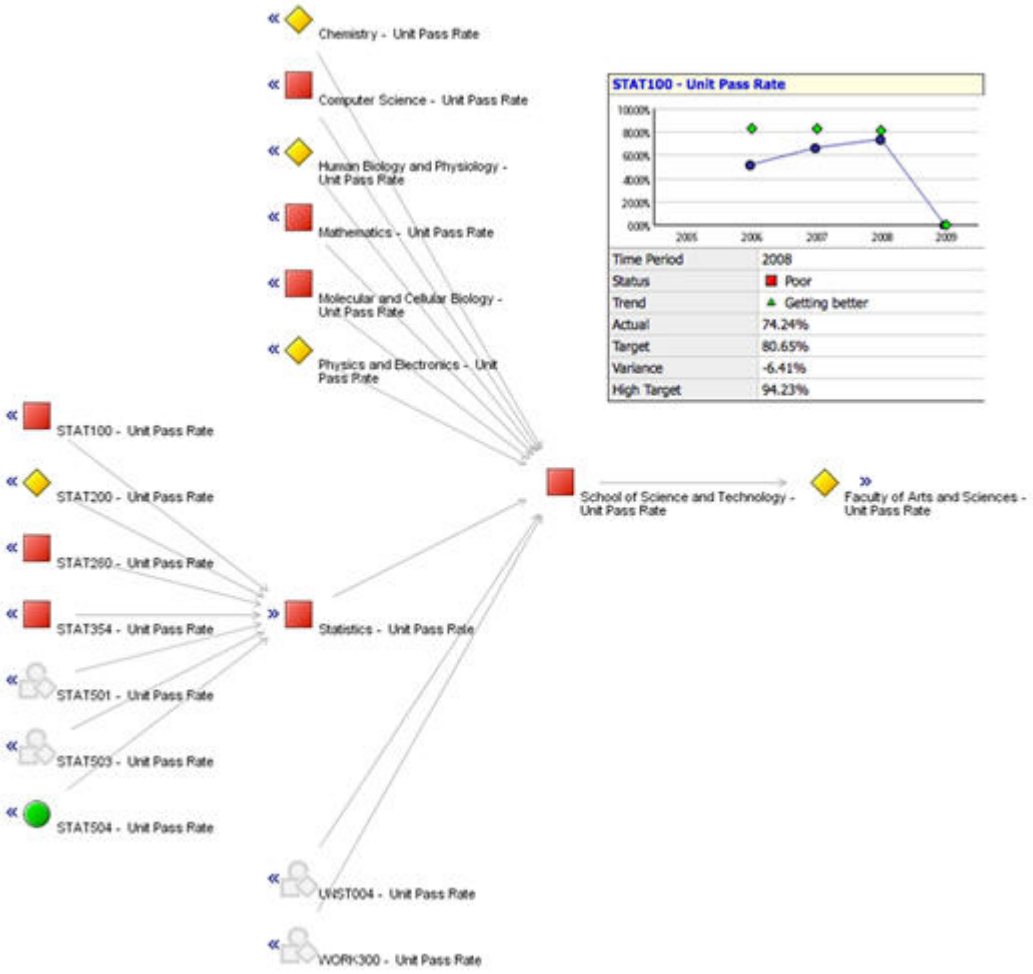
Variables in Unit Monitoring

This example shows:

- Navigation panel to select a particular unit grouped by course, department, faculty and whole university;
- Metrics in 3 groups
  - Enrolment and Progression: completion, enrolment count, pass rate, retention;
  - Grade Distribution: distinction, credit, pass, fail, incomplete;
  - Unit Evaluation (priority areas only): constructive feedback, timely feedback, overall satisfaction, response rate.
- Traffic lights (green = top x %; amber = mid y %; red = bottom z% - often referred to as RAG status –red, amber, green)
- Trend (increasing, stable, decreasing

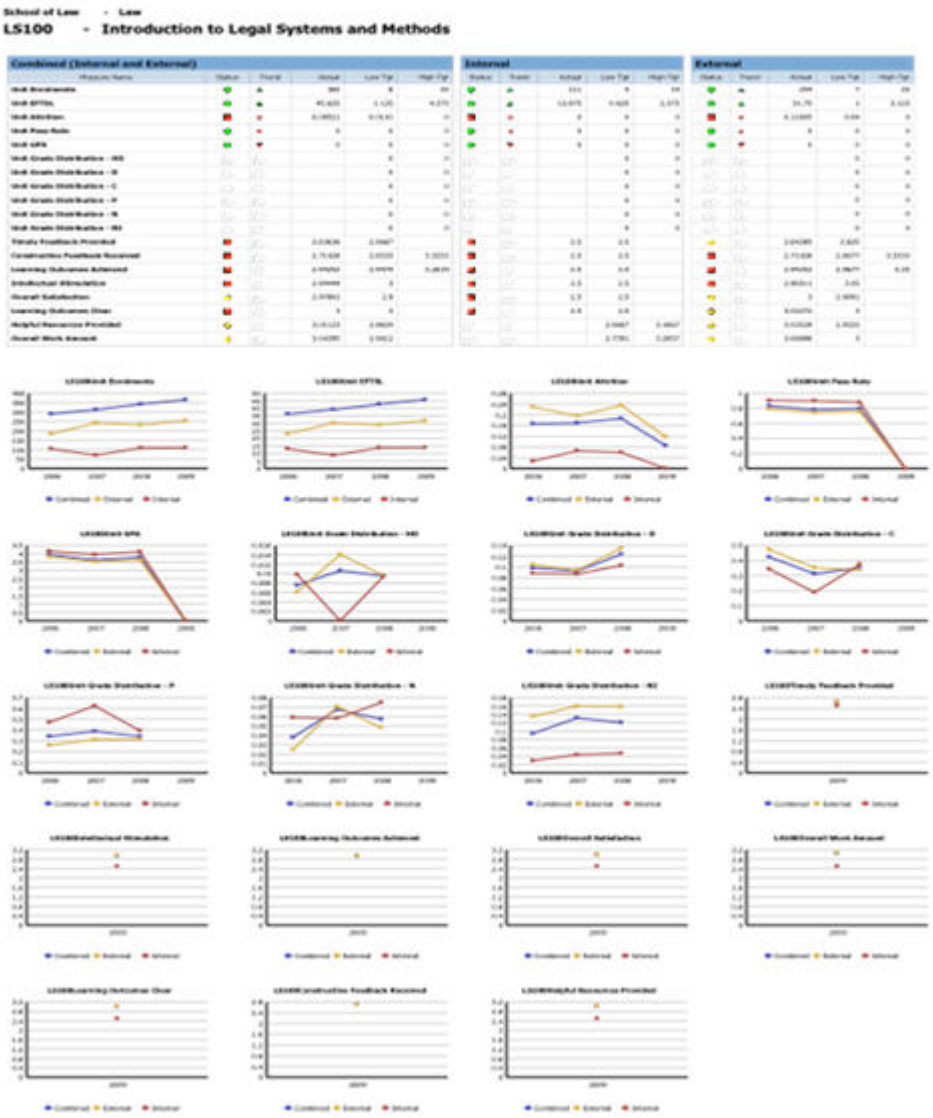
- Actual performance measure
- Target measure
- Variance from target
- Time of measurement

The next example (below) illustrates the ability to view unit monitoring data at various levels, especially in terms of the discipline, faculty or university. Although this example is taken from a smaller university, the scale and power of unit monitoring is still considerable (e.g. data for 3,500 units, on 20 variables over 2 semesters a year for a 4-year time series produces 560,000 measurements or data points).



Various Levels of Unit Monitoring Data

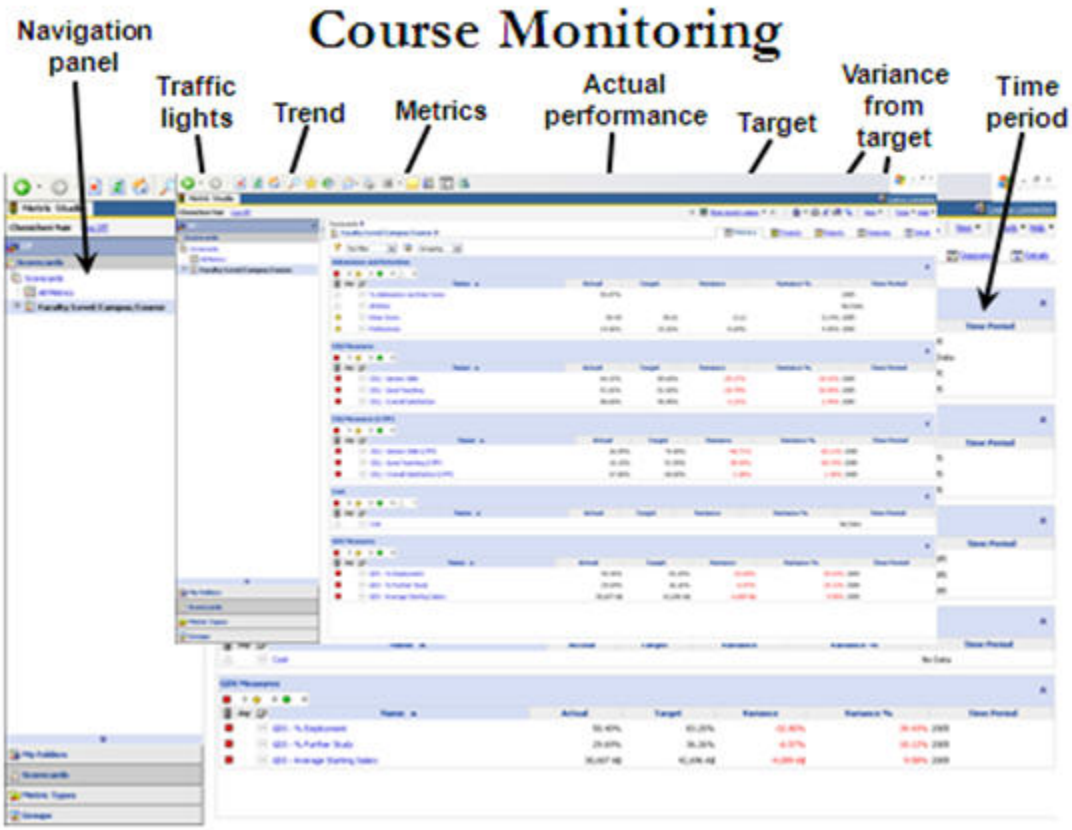
The next example (below) illustrates the ability to generate time series performance of a particular unit.



Time Series Performance of a Unit

4. Course / Program Monitoring

We have seen how Unit Monitoring works. Now let's take a look at Course (Program Monitoring. Course Monitoring follows a similar pattern to Unit Monitoring although the actual measures are different. Each of the reports available for Unit Monitoring are also available for Course Monitoring. An example of Course Monitoring is illustrated below.



Example of Course Monitoring

5. Retention Monitoring

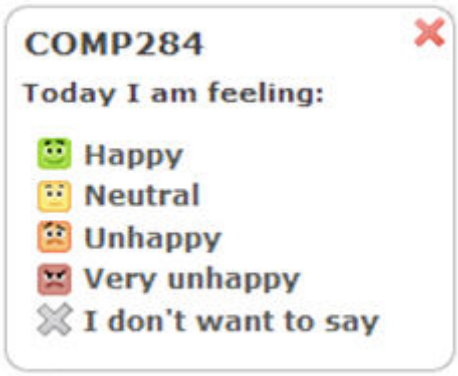
Whereas variables associated with Unit and Course Monitoring usually only change when the unit or course has been completed, Retention Monitoring is real-time. Losses through Attrition (the other side of Retention) are a tragedy for all concerned: the student in terms of lost opportunity, emotional and financial loss; parents and family similarly; the institution in terms of losing students it has claimed as its own and in terms of lost revenue. For example, a rough calculation would indicate that a one percentage point gain in Retention at universities in Australia results in approximately $1m additional revenue to the institution.

There is a large research literature concerning student retention which points to the importance of students new or returning to a course being actively engaged at a very early stage (see for example, Mantz Yorke & Bernard Longden (2004) Retention and Student Success in Higher Education, Open University Press). Retention is equally important for campus-based and distance education institutions, although the mechanisms for engagement may vary. An example of Retention Monitoring at a distance education institution is illustrated below.

As student engagement at a distance education university is mainly through the internet, a number of measures can be taken to indicate whether the student is accessing and thus engaging with the institution. An example of such measures is as follows.

Student enrolled in an elective unit (-0.35)	Student failed a unit in a prior semester (-1.8)
Student enrolled in a compulsory unit (+0.25)	Student recorded a Fail Incomplete (NI) against a unit in a prior semester (-2.5)
Student registering 'Very Unhappy' in e-Motion against a unit (-4.5)	No e-Reserve activity for > 40 days for this unit (-1.5)
Student registering 'Unhappy' in e-Motion against a unit (-3.5)	Student enrolled in >= 6 units in this teaching period (-1.8)
Student with no access to Student Portal > 40 days (-3.0)	Student has been sent an e-Motion email previously in a teaching period (-1.2)
Student is enrolled in a unit with "High" historical attrition (-0.8)	Student has appeared in High Risk category in a previous teaching period (-2)
Student is enrolled in a unit currently recognised as having "High" attrition - dynamic , real-time (-1.4)	Student was enrolled in a Pathways Enabling course previously (-1.2)
Student admitted through Alternate Entry Pathway (-0.75)	Student has been granted 1-2 assignment extensions this teaching period (-0.6)
Student is an international student (-0.85)	Student has been granted > 2 assignment extensions this teaching period (-1.4)
	Student has submitted > 2 assignments late in current teaching period (-1.6)

The e-Motion variable refers to emoticons that the student can react to whenever they enter the university internet portal and which provide students with a real-time opportunity to say how they are feeling as follows (see below). The number in brackets refers to the weighting of each variable.



Emoticons may appear the most trivial of feedback devices, but are in fact a powerful way of picking up problems students are having - as they actually happen - as well as indicating units and courses that students find exemplary. A real-time report of all units in the university can be generated as a 'heat map' to indicate the units on that day or in that week, that students are saying they are having problems with and

thus give the opportunity for a unit coordinator or Head of Department to step in if required to fix any problem.

The complete set of thirty or so variables (or triggers) are collected automatically as the student interacts with various systems – there is no academic or IT staff workload in collecting the data. The variables are weighted following some analysis to indicate their efficiency in predicting retention and so can be reduced over time and given further analysis. Approximately 270, 000 data points are calculated each night in this system to provide a report each morning on the most 'at risk' student to the least 'at risk' student – in fact the report indicates the top 50 students at risk of attrition and the time that they have been 'on the list'. With over a million items being calculated a year, the advantages and power of bringing different Databases together into a Data Warehouse to allow reporting through a Business Intelligence system becomes apparent. However, as with all monitoring measures, the management response to the data is critical and following up on 'flagged' cases immediately through sustained and careful case-management, is obviously a necessity.

These are just some examples of Evaluation through Monitoring and to close the topic the future of Evaluation in terms of traditional Review and increasingly pervasive Monitoring will be discussed.

6. Review vs. Monitoring

We have looked at the Review and Monitoring aspect of evaluation. Now let's take a look at the summary of differences between Review and Monitoring.

Review	Monitoring
Long time period: 5 yearly	Short time period: daily, week, month, semester, year
Mainly external people	Mainly internal people
Backward, summative (some formative and improvement orientation)	Forward, formative, improvement orientation
Novel and disruptive	Normal and mainstream
Follow up 'lumpy' and not pervasive	Follow up fast and pervasive

Applies to internal academic reviews and 20 years of Quality Agency audits	Increasingly applies to the way institutions do business

It is an interesting point of discussion whether that time-honoured method of Academic Review will remain as powerful, given the growing availability of instant and very detailed information that will routinely be used by institutions through Business Intelligence systems. Even the point of Reviews providing an opportunity for External judgment of the institution's performance may be undermined. The 'external experts' who form a review panel, no matter how carefully chosen, are very few in number and the panel is therefore subject to possible bias and over-reliance on the experience of the 'expert' – which naturally goes to what they know from their own context rather than what they know of the institution they are reviewing. On the other hand, as Business Intelligence systems become common place, opportunities for benchmarking grow. And while some information may be regarded as commercially sensitive, this has not stopped private companies undertaking extensive benchmarking activities and providing that the rules of the exercise are agreed, there is no reason why much greater comparative use will not be made of the burgeoning information available. Should this happen, it may be in the future that there is a reversion to Review as ad hoc and crisis driven, rather than periodic and routine. Much will probably depend on the survival and direction taken by national quality agencies, and especially whether they are able to adapt the audit (Review) model that has persisted over the last 20 years or so, in the face of mainstreamed, sophisticated and automated Business Intelligence information being used on a daily basis by institutions. This same point (regarding the ability to adapt requirements and processes to meet the new internal circumstances of institutions) also applies to Government Departments and to accreditation agencies.

7. Discussion

Discussion: Monitor

Consider the following key questions regarding Monitoring at your own (or choose one) institution:

- What monitoring activities in the area of teaching and learning are undertaken routinely?
- Who has responsibility for ensuring that the monitoring activities are undertaken? What Committees have responsibilities for monitoring reports?
- What improvements concerning Monitoring would you recommend to your own (or choose an) institution?

8. Summary

This topic covered the following main points:

- Business Intelligence reporting makes its strongest contribution when it produces real-time reporting (i.e. changing by the second) usually on important business related variables such as student inquiries and recruitment, admission, enrolment, load and financials - increasingly in the form of an 'Executive Dashboard' of automatically updated and real-time key information.
- In the teaching and learning area, three reporting areas will be considered as becoming commonly used for quality purposes (with one of these being an

example of real-time reporting): the monitoring of units (subjects); courses (programs) and retention (which is the example of real-time reporting).

- The differences between Review and Monitoring may be summarised as follows.

Review	Monitoring
Long time period: 5 yearly	Short time period: daily, week, month, semester, year
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