CHAPTER TWO: RESEARCH DESIGN AND METHODOLOGY

Introduction

This chapter describes the research design and process of the NQF Impact Study, including:

- development of the research design;
- Impact Indicators for the NQF Impact Study;
- sampling and stratification;
- instrument development;
- data collection;
- data analysis;
- levels of impact; and
- methodological findings.

Development of the research design

In 2003 SAQA embarked on a longitudinal study to measure the impact of the National Qualifications Framework (NQF) on the transformation of education and training in South Africa. This study was planned in a number of continuous cycles. The first cycle, which was completed in 2004, focused in particular on the development of a research design that could be used in consecutive cycles. Over a period of some 14 months the project team interrogated the five NQF objectives in order to develop a set of criteria, referred to as 'Impact Indicators'. This process included a wide range of interviews and focus groups with NQF stakeholders in order to make sure that the research design, with the Impact Indicators as a nucleus, was well accepted and agreed by stakeholders, and also sufficiently robust to allow for the research design to be repeated in following years.

The research design of the NQF Impact Study comprised the following components (adapted from SAQA, 2004):

- The five NQF objectives form a fixed point of reference to allow the research design to evolve Yet remain relatively stable.
- The research design would be longitudinal and comparative in nature, being repeated in consecutive cycles.
- The second cycle would be used to establish a baseline against which subsequent measurements would be compared.
- Three common components to be included in each application of the research design are:
  - *Contextualisation* - the purpose of the contextualisation is to outline the origins of the NQF and to describe current issues of NQF implementation both in South Africa and internationally. It defines a context for interpreting and using findings from the NQF Impact Study.
  - *Data gathering* using structured sampling methods.
  - *Development of findings and recommendations* based on the analysis of the data gathered, and related to the context and the period in which the study takes place.
- An 'Impact Indicator approach' would be used to facilitate the gathering of appropriate data, the analysis of such data and the findings and recommendations that would emanate from each cycle.

The research design is illustrated in the diagram below:

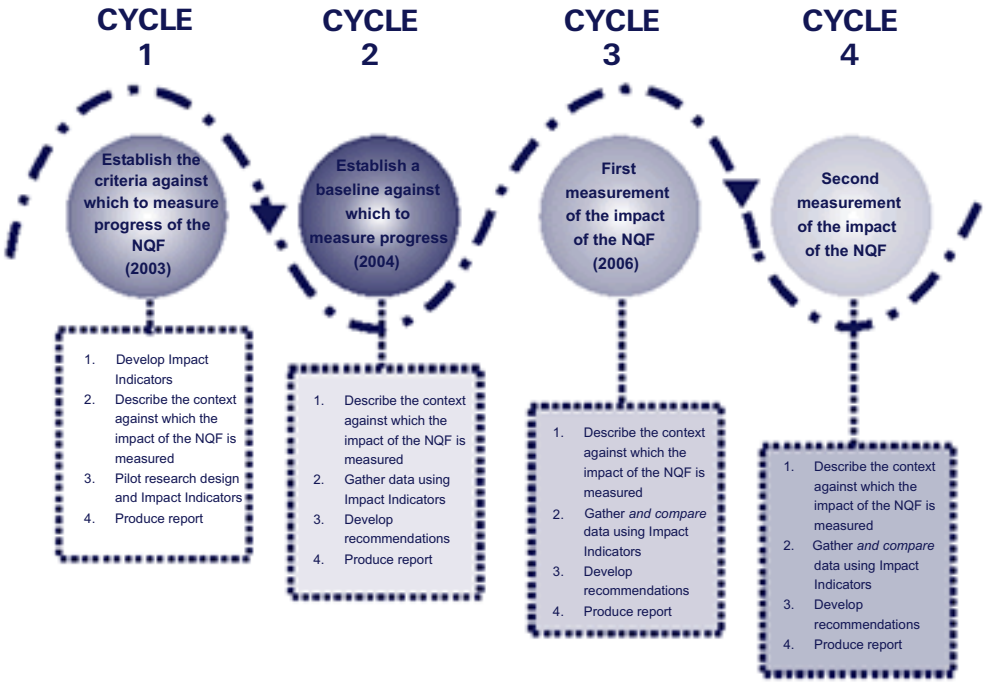


Diagram 2: Research design of the NQF Impact Study

Three important considerations underpin the research design: *replicability*, *cost-effectiveness* and *credibility* (also see Tuck *et al*, 2004). If the NQF Impact Study is to consistently deliver policy relevant statistics that provide a profile of the condition of NQF implementation over an extended period of time the research design must be easily replicable, relatively inexpensive and, most importantly, credible. These aims have been pursued as follows:

Replicability

- use of a consistent set of Impact Indicators;
- publicly accessible evaluation instruments; and
- full description of methodology employed.

Cost-effectiveness

- use of available and accessible data sources, such as the NLRD and a database of respondents and their constituencies; and

- accessible data formats, such as MS Access that can be maintained over time.

Credibility

- transparency and openness to review; and
- use of independent external contractors.

Impact Indicators for the NQF Impact Study

An agreed definition of an Impact Indicator in the context of the NQF Impact Study was generated on the basis of a review of international and South African literature on similar measurements, particularly in the education and training context. The definition was also informed by the extensive piloting and revision phases with education and training stakeholders. For the purposes of the Study:

> An Impact Indicator is defined as a policy-relevant, quantitative and/or qualitative statistic designed to provide a profile of the current condition, the stability or change, the functioning, and/or the effect of the NQF on the transformation of education and training in South Africa (SAQA, 2004:16).

The following is a list of the Impact Indicators that were developed during the first cycle of the study:

	Impact Indicator	Definition
Set 1: The extent to which qualifications address the education and training needs of learners and South African society		
1.	Number of qualifications	The number of NQF registered qualifications
2.	Effectiveness of qualifications design	The contribution that qualifications design makes to ease of access, mobility and progression of learners
3.	Portability of qualifications	The extent to which qualifications facilitate the mobility of learners horizontally, diagonally and vertically
4.	Relevance of qualifications	The relevance of qualifications in relation to the needs of workplace, industry and society at large including non traditional qualifications (qualifications offered in new and emerging fields of learning)
5.	Qualifications uptake and achievement	The extent to which NQF registered qualifications are offered and the extent of achievement of such qualifications by learners
6.	Integrative approach	The extent to which qualifications promote an integrative approach to education and training and the nature of such qualifications
Set 2: The extent to which the delivery of learning programmes addresess the education and training needs of learners and the South African society		
7.	Equity of access	The ease of entry and access of traditional and non-traditional learners to education and training including admission requirements and the recognition of prior learning
8.	Redress practices	The extent to which redress practices, including the recognition of prior learning (RPL), facilitate the award of credits and/or access of learners to learning programmes
9.	Nature of learning programmes	The expansion of learning opportunities and the impacts of learning programmes, including an outcomes-based approach to curriculum development and learning and teaching
10.	Quality of learning and teaching	The extent to which learning and teaching practices are responsive to the needs of learners through improved teaching practices
11.	Assessment practices	The fairness, validity, reliability and practicability of the assessment of learning
12.	Career and learning pathing	The extent to which learning programmes support and enhance career and learning pathing

[1] *Examples include, but are not limited to, Bottani and Tuijnman (1994) and Bottani and Wahlberg (1994).*

Set 3: The extent to which quality assurance arrangements enhance the effectiveness of education and training		
13.	Number of registered assessors and moderators	The number of skilled assessors and moderators required to support an effective education and training system
14.	Number of accredited providers	The number of education and training providers who meet the quality requirements of the system
15.	Quality assurance practices	The extent to which quality assurance practices enhance the quality of learning, teaching and assessment
Set 4: The extent to which the NQF has had a wider social, economic and political impact in building a lifelong learning culture		
16.	Organisational, economic and societal benefits	The extent to which learner-centredness is embedded in organisational, economic and social environments in order to build a lifelong learning culture that empowers individuals and communities
17.	Contribution to other national strategies	The extent to which the implementation of the NQF supports and contributes to the achievement of national strategies such as the Human Resource Development (HRD), National Skills Development Strategy (NSDS) and Tirisano

Table 2: Impact Indicators for the NQF Impact Study (SAQA, 2004:61)

The 17 Impact Indicators form the nucleus of the NQF Impact Study research design and were used as the basis for the development of research instruments.

Sampling and stratification

The first cycle report contained recommendations pertaining to the future cycles of the study (see Appendix 2). All of these recommendations were implemented with the exception of the recommendation that "Representative sampling must form part of subsequent cycles of the Impact Study".

The project team faced a dilemma: how to balance the available resources with this seemingly unobtainable status of using 'representative sampling'. The work of Lutz (1983) proved particularly helpful to explore this issue, explaining that a number of approaches to sampling are possible, ranging from *simple random sampling* where every respondent is given an index number and index numbers are picked at random until the sample size is reached; *systematic random sampling* where respondents are selected using a set interval from a population list, e.g. every 20th case; *clustered random sampling* were the initial random selection of geographical areas (clusters) is followed by a survey of all or of a sample in the cluster; *quota sampling* where interviewers find respondents who fit into predetermined categories until their quotas are filled; and *stratified random sampling* where the population is first divided into a number of strata according to some characteristic, chosen to be related to the major variables being studied.

According to Lutz, *stratified random sampling* is particularly useful when sub-populations vary considerably. The strata should be mutually exclusive (every element in the population should be assigned to only one stratum) and collectively exhaustive (no population element can be excluded). A sample size is determined for each of the strata as though it were a separate population. There are two possibilities:

- proportionate allocation - a sampling fraction is used in each of the strata that is proportional to that of the total population, e.g. Gender
- disproportionate allocation (optimum allocation) each stratum is proportionate to the standard deviation of the distribution of the variable, large samples are taken in the strata with the greatest variability to generate the least possible variance

[2] www.soc.surrey.ac.uk/samp and en.wikipedia.org

It became increasingly apparent that even a limited attempt at obtaining samples that would be representative of all sectors and groupings on a proportional basis would be impossible.

It was also important to keep the repeatability of the study in mind. An alternative approach would be to select unique groupings of populations that are reasonably accessible. According to Crouch (2000:10) it may be possible to measure how the system is perceived to be working in general, but warns against making any inferences regarding the populations or sub-populations unless the sample sizes are large enough.

It was decided that the sampling approach for the NQF Impact Study would need to be based on pragmatic considerations. The need to develop a research design that would be repeatable was deemed more important than representing all sectors and groupings on a proportional basis. It was therefore decided to use purposive quota sampling. The Cycle 1 recommendation to make use of representative sampling only (SAQA, 2004:79) has not proved to be feasible and would most probably continue to be problematic in future cycles.

The second recommendation from the Cycle 1 report suggested that the inclusion of a wide range of stakeholders, such as providers, employers, learners, unions and government departments be maintained, but also be broadened to include more Small, -Medium, Micro Enterprises (SMMEs) and professional bodies.

It was further decided that data collected according to the stakeholder categories would be sufficient to determine the impact of the NQF. Even so, it was accepted that although generalisations across the population as a whole would be possible, strata-specific generalisations would be inappropriate. The following example illustrates the point:

- it may be possible to say that, in general, assessment practices have improved - based on a significant number of positive responses to related questions, supporting qualitative evidence (from interviews) and quantitative support (such as survey data);
- it will not be possible to say that, based on just the responses from the employers, that employers in general are of the opinion that assessment practices have significantly improved.

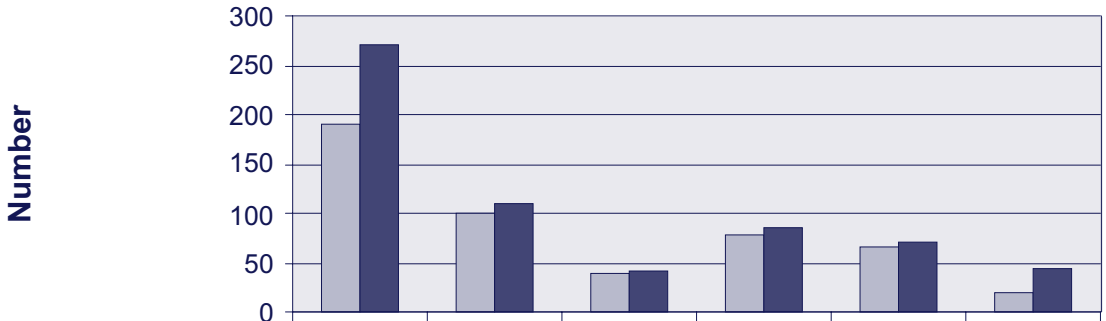
The suggested categories and quotas, as recommended in the Cycle 1 Report, are listed in the table below:

Category	Strata	Suggested quota	Actual quota
Providers[1]	GET band (including ABET and secondary schools)	100	143
	FET band	50	79
	HET band	40	49
Businesses	Large	50	71
	SMME	50	39
Organised Labour	Education	10	10
	Other	30	32
Quality Assurance bodies	ETQAs	60	54
	Professional bodies	18	32
Standards Setting bodies	NSBs	36	32
	SGBs	30	38
Government departments	DoE	10	26
	DoL	10	18
Subtotals		494	623

Table 3: Quotas for Cycle 2 of the NQF Impact Study

[1]The study did not focus on the schooling sector below NQF level 1, or below the General Education and Training Certificate. However, it did look at Adult Basic Education and Training (ABET), including the three sub-levels leading to the achievement of a qualification at NQF level 1, or ABET level 4.

In total, 623 individuals participated in the interviews, focus groups and the completion of the questionnaires The graph below gives an overview of the different categories that were represented and the extent to which the quotas were achieved:



	Providers	Business	Organised Labour	ETQAs	NSBs and SGBs	DoE and DoL
Suggested quota	190	100	40	78	66	20
Actual quota	271	110	42	86	70	44

Graph 1: Quotas for Cycle 2 of the NQF Impact Study

The choice for the particular categories and strata was based on the need to represent all NQF stakeholders (those individuals and organisations that make use of the NQF) and partners (government departments and quality assurance bodies that participate in NQF implementation). Based on the Cycle 1 results, it was expected that the provider category would be the largest.

Instrument development

A questionnaire was developed by SAQA and piloted with 15 experts. Some experts were knowledgeable on the NQF in particular, whilst others had experience in instrument development.[4] The individuals were selected with the following criteria in mind: representivity of the stakeholder groupings envisaged for the national survey; personal involvement with and knowledge of the NQF; expertise in the design of questionnaires and surveys. The individuals were asked to complete the questionnaire, but also to make comments on the questions and the overall usefulness of the questionnaire in a survey. The purpose of the exercise was to improve the draft questionnaire.

The questionnaire was amended substantially after this piloting and a workshop between the SAQA research team and the two international consultants involved with the project.

The questionnaire was edited for language and accessibility following which it was printed and used during the research. The same questionnaire was used both for the interviews and the national survey to ensure comparability of the results. The questionnaire is available as Annexure 9.

Data collection

Keeping in mind that the NQF Impact Study is a longitudinal and comparative study and that quota sampling would be used, the Cycle 2 data collection comprised three components: stakeholder interviews and focus groups, analysis of qualifications on the National Learners' Records Database and a national survey.

[3] The study did not focus on the schooling sector below NQF level 1, or below the General Education and Training Certificate. However, it did look at Adult Basic Education and Training (ABET), including the three sub-levels leading to the achievement of a qualification at NQF level 1, or ABET level 4.

[4] Experts included: Melissa King (Independent Examinations Board), Mamsie Sebolai (Association of Private Providers of Education and Training), Rachel Prinsloo (Technikon South Africa), Kathy Munro (University of the Witwatersrand), Dorette van Ede (Unisa), Anthea Saffy (AMPLATS), Rob van der Schyff (South African Breweries), Inge Dougans (Vacuflex an SMME provider), Gerard Smith (Construction SETA), Maire Kelly (NSB09 coordinator), Erik Halendorff (Assessment SGB), Tommy Baloyi (South African Council for Educators), Bennie Anderson (First National Bank) and Karlien Murray (Professional Accreditation Body).

Stakeholder interviews and focus groups

A SAQA research team completed 111 interviews and 12 focus groups across all nine South African provinces in the period June to November 2004. The interviews and focus groups were transcribed and thereafter analysed. A quantitative analysis was completed on MS Access and Excel. A qualitative analysis was performed with ATLAS.ti [5] using 91 codes premised on the 17 Impact Indicators.[6]

Analysis of qualifications on the NLRD

The SAQA NLRD manager was responsible for a quantitative summary of qualifications (including unit standards) and learner data on the NLRD as available on 31 January 2005. [7] This quantitative summary was supported by a qualitative analysis, performed by an independent expert, of a sample of qualifications on the NLRD.[8] The analysis aimed in particular to investigate the extent to which the current qualifications registered on the NQF addressed the education and training needs of learners and South African society (see Set 1 in Table 1). The qualitative analysis was limited to regular qualifications[9] in three particular sectors:

- Physical Planning and Construction
- Mining and Minerals
- Hospitality, Travel, Tourism and Gaming

The choice of the three sectors was based on the number and range of qualifications in each. The relative distinctiveness of each sector as well as accessibility to key stakeholders also informed the decision.

Nine qualifications were randomly selected from the Physical Planning and Construction Sector, six from the Mining and Minerals Sector and three from the Hospitality, Travel, Tourism and Gaming Sector.

National survey

An independent research company was contracted to administer a national survey on behalf of SAQA.[10] The analysis of their findings was reported to SAQA and was used together with the stakeholder interviews, focus groups and the NLRD analysis in the Cycle 2 Report. The external nature of the survey contributed to the validity of the final report as triangulation between the independent survey findings and the findings of the SAQA interviews and focus groups was possible. These are commented on extensively in Chapter 4 of this report.

Over and above the fact that the 17 Impact Indicators formed the nucleus of the data collection and subsequent analyses, a common instrument was also used. The development of the instrument was discussed in the previous section.

Data analysis

The three empirical data sources (stakeholder interviews and focus groups, analysis of NLRD data and results of the national survey) were analysed independently:

SAQA was responsible for analysing stakeholder interviews and focus groups, through the open coding of transcripts with qualitative analysis software (ATLAS.ti). Codes were based on the Impact Indicators, but also reflected the various nuances of the relevant questions in the questionnaire (see Appendix 3 for a full list of all the codes). Coding was followed by a grouping of relevant codes per stakeholder category, into summaries and initial separate analyses (see Annexures 2-6).

[5] ATLAS.ti is qualitative analysis software that is a particularly useful tool when significant quantities of text need to be analysed (www.atlasti.de)
[6] See Appendix 3
[7] See Annexure 7
[8] See Annexure 8
[9] Regular qualifications are defined as those qualifications that have been developed through a standards generating process, as opposed to historic provider-based qualifications, developed by individual providers of education and training.
[10] See Annexure 5

Both SAQA and the external provider were responsible for analysing NLRD data. SAQA looked at the quantitative data, including a summary of the number of qualifications and unit standards registered on the NQF. The external provider looked at a sample of regular (i.e. not provider-based) qualifications on the NQF from three particular sectors: mining, tourism and construction.

The external provider was tasked to conduct and analyse the responses from a national survey. The Terms of Reference prescribed random quota sampling within the same categories and strata that were used for the interviews (see Table 4). The responses were captured on MS Access and included verification of 10% of the sample. The provider compiled a report of the analysis of the responses (Annexure 8). As most of the SAQA interviewees also completed the same questionnaire their responses were analysed in a similar, but separate, manner (Annexure 1).

The analyses of the three empirical data sources were then merged, using the Impact Indicators as ordering mechanism, as summarised in Chapter 4 of this report. The findings put forward by each analysis were compared with each other. In most cases the findings were similar or identical. In some cases there were contradictions and disparities.

Levels of impact

An important aim of the research design of the NQF Impact Study is to provide a 'comprehensive summary of the type of impact that has been achieved per Impact Indicator' (SAQA, 2004:56). Although this component was tentatively explored in the Cycle 1 Report (see pp. 56-57) no specific recommendation was offered. Now, with the second cycle data available, and the added hindsight gained from the first cycle analysis, it has become necessary to agree on the way in which the level of impact can be reported.

The term 'no impact' as used in the Cycle 1 Report has been replaced with 'minimal/mixed impact'. This change in terminology was based on agreement that even the slightest positive or negative impact could be placed in either of the minimal or negative categories. Likewise, in cases where the evidence was mixed, i.e. included both positive and negative statements, it was agreed that the impact would still be minimal, even if on balance, the evidence was more positive.

The following continuum of levels of impact has been used in Cycle 2 and proposed for continued use in subsequent cycles of the NQF Impact Study:

HP: High positive impact	The research evidence shows a marked positive change across most of the education and training system as it pertains to the NQF
M: Moderate impact	The research evidence shows moderate positive change across the education and training system
MM: Minimal/mixed impact	The research evidence shows minimal positive and/or a mix of positive and negative change across the education and training system
N: Negative impact	The research evidence shows a marked negative change across most of the education and training system as it pertains to the NQF

Diagram 3: Continuum of levels of impact for the NQF Impact Study

The determination of the levels of impact was based on the type and range of quantitative and qualitative data collected.

Findings regarding the methodology

The research design that emanated from Cycle 1 through extensive piloting and refinement proved to be appropriate for Cycle 2 even though some modifications were necessary. The fact that the NQF Impact Study is a longitudinal comparative study requires that the research design remain largely unaltered, while still allowing for some minor adjustments. The following is a summary of the findings that relate to the methodology employed during Cycle 2:

1. The longitudinal and comparative research design was considered to be useful and should be continued in future cycles.

2. The three components of the research design, namely contextualisation, data gathering and findings should also be continued.

3. The Impact Indicator approach provides a useful ordering mechanism for the research process, including the design of research instruments, data analysis and findings and recommendations. The dynamic nature of the indicators also allows for some changes during each cycle of the Study to ensure contextual sensitivity.

4. The following findings relate to specific Impact Indicators:
    a. Impact Indicator #2 (*Effectiveness of qualification design*) may be too broad. Firstly, there was significant overlap with other indicators (e.g. Impact Indicator 4: *Relevance of qualifications*). Secondly, the design of qualifications is expected to have a wash-back effect on the design of learning programmes and therefore, there is another overlap with Impact Indicator 9: *Nature of learning programmes.* In Cycle 3 of the Impact Study, there may be a need to reconsider whether this impact indicator could be subsumed in the two above-mentioned Indicators, or whether it could be modified to focus more on the effect of qualification design *on learning programme design*.
    b. Impact Indicator #16 (*Organisational, economic and societal benefits*) is also too broad. This indicator should be separated into three separate indicators that have a distinct focus on organisational aspects, economic relevance and societal benefits.
    c. Impact Indicator #17 (*Contribution to other national strategies*) should be updated to reflect the changes in the role and vision of the Department of Education.

5. The inclusion of a wider range of stakeholders should be maintained and broadened to include more SMMEs, standards-setting bodies and professional bodies.

6. The difficulties faced both in Cycles 1 and 2 in including the voice of learners need to be investigated. The development of stakeholder-specific variations of the instruments (as opposed to the single generic questionnaire used in Cycle 2) may be useful.

7. Replicability, cost-effectiveness and credibility should remain important considerations. The intended outsourcing of Cycle 3 will be dependent on the extent to which these considerations are acknowledged. Furthermore, it will be necessary for SAQA to conceptualise carefully what is meant by outsourcing of this project and the extent to which SAQA would remain involved, albeit in a supporting an advisory capacity.

8. The qualitative analysis of NLRD data proved to be particularly challenging for an external research agency. The extended time required to fully understand the database construction, qualification terminology and structure, suggests that the scope and purpose of this component in the NQF Impact Study may have to be reconsidered.

9. The significant contribution of the two international experts is acknowledged. Their involvement as critical readers during future cycles will be of great value.

10. Local and international publication of the results of Cycle 2 will add value to the study and should be encouraged.

11. Quota sampling proved to be suitable to a project of this nature. The need to develop a research design that would be repeatable was deemed more important than representing all sectors and groupings on a proportional basis.

12. The questionnaire that was developed for Cycle 2 was useful in gathering the relevant data but can be improved. The following recommendations are made:
    a. the questionnaire should be considerably shortened;
    b. category-specific variations should be considered; and
    c. the extent to which specialised knowledge is required in order to answer the questions should be reconsidered - the questionnaire should be simplified to be more accessible to non-expert respondents.

13. The inclusion of secondary schools in the sample proved to be particularly problematic. It should also be noted that this study did not focus on the schooling sector below NQF level 1, or below the General Education and Training Certificate (GETC). However, it did look at Adult Basic Education and Training (ABET), including the three sub-levels leading to the achievement of a qualification at NQF level 1, or ABET level 4. The schooling sector, in particular, conflated outcomes-based education (OBE) with an outcomes-based approach. It is recommended that targeted research is undertaken in this area, specifically in terms of the conceptual differences and practice between OBE in schools and an outcomes-based approach as understood as a key underpinning principle of the NQF.

14. The four Sets of Impact Indicators,[11] which were particularly useful in the first cycle to develop the Impact Indicators, were less prominent in the second Cycle but were nevertheless found useful in interpreting the findings. In future applications, these Sets should retain this facilitating role and if necessary, be used even more explicitly.

15. The methodology employed to determine the levels of impact should be refined. The criteria could be conflating two distinct variables:
    (1) the *extent of the impact* of the NQF on the education and training system - mostly concerned with numbers and systemic changes; and
    (2) whether the NQF has had *beneficial impact* on the education and training system - more concerned with issues of quality, access, redress, etc.

It is recommended that this awareness of the two dimensions be incorporated into the methodology.

Summary

The research design and methodology emanating from Cycle 1 of the NQF Impact Study proved workable in Cycle 2. With the exception of representative sampling, the suggested research design was maintained and further refined. The opportunity to triangulate between three data sources added a particularly robust dimension to the overall research design and should be replicated in subsequent cycles.

[11] The Sets are:
(1) The extent to which qualifications address the education and training needs of learners and South African society;
(2) The extent to which the delivery of learning programmes address the education and training needs of learners and South African society;
(3) The extent to which quality assurance arrangements enhance the effectiveness of education and training; and
(4) The extent to which the NQF has had a wider social, economic and political impact in building a lifelong learning culture.