METHODICAL APPROACHES TO DEVELOPING COURSEWARE AND MANAGING ASSESSMENTS FOR LEARNERSHIPS BASED ON UNIT STANDARDS

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Abstract:

Where are the days of the lazy lecturer's last minute preparations? Yes, those were the days of quickly setting up some presentation slides for delivery to the classroom within the next hour. Those days of lackadaisical nonchalance should have never existed and are now way gone. Delivery to the classroom on a particular date and time must now be prepared sometimes up to a year in advance. Why is this and is it really necessary? The answer to these questions will always be that yes, there should be standards and procedures followed, for ensuring efficient service to our clients, the students. The South African Qualifications Authority (SAQA) has played an integral part in the implementation of valuable standards for education in South Africa (SAQA, 2001; Van Rooyen, and Prinsloo, 2002). Educational institutions are encouraged, and in fact expected, to conscientiously adopt methods and practices to ensure adherence to these standards. The problems experienced by the educational institutions in their efforts to adopt standards, are those of application and conversion of current delivery practices and courseware, where the older methods of application may be quite different from that expected by the standards. This paper presents some approaches used by the Nelson Mandela Metropolitan University to prepare courseware for these standards, and to control the assessments and portfolios. The paper is aimed at educationists who intend to train and assess learners, but in particular at those educationists who wish to develop courseware and assess learners for a skills-based SAQA qualification (ie a learnership).

Introduction

The South African Qualifications Authority (SAQA) plays an important role in focusing on the standards of education in South Africa, and in particular with the development of the South African National Qualifications Framework (SANQF) (SAQA, 2001). The National Qualifications Framework (NQF) is aimed at an integrated education system with the intention to implement it in such a way that at all levels and sectors of education and training, there is a means to link up to this National Qualification Framework. It implies equal valuation of learning such that learners need not redo aspects achieved elsewhere. Credits can be passed between institutions. The NQF thus serves as a reference point for all new developments in education.

When determining purpose and objectives, the following were considered important when providing the framework: (Blom, 2006b; Bezuidenhout, n.d.; Van Rooyen, and Prinsloo, 2002):

- The creation of an integrated national framework for learning achievements

- The facilitation of access and mobility within education

- The enhancement of the quality of education

- The necessity to accelerate the redress of past unfair discrimination in education

- The contribution made to the personal development of learners

Will the NQF be ever totally implemented, right down to the practice adopted within the individual classroom event? If this can be achieved, it may be viewed as the first in the world, i.e. South Africa would be a leader. Jansen (as cited in Blom 2006b) thought was that the complete adoption of the NQF would be impossible to achieve but subsequent measurements have shown that the NQF is making inroads into the changing face of education. What is crippling the process of the total implementation of this policy? There should not be paralysis due to the institutions not being prepared at ground level! What problems are being experienced? What would constitute a measure of the total acceptance of the policies behind the NQF? One cannot ignore the possible benefits that can result from the complete integration of qualifications such as suggested by the NQF.

In particular, Blom (2006b) reported on how various aspects are measured as indicators of the level of acceptance of the NQF. According to Blom (2006b) only moderate impact has been made in the number of assessors and moderators who have been registered, and the number of training providers that have been accredited. Educationists therefore need to meet the new expectations from the bottom-up. Educationists should attend the available training courses and obtain certification for the assessment and moderation functions that are required for the new qualifications. If SAQA provides registered qualifications and continues to expand on these, then the educational institutions can adopt them, but would be required to cultivate the necessary skills.

From the educational institution's point of view, the new SAQA qualifications have led to a major redesign of courseware. According to Blom, improvements have been made in the courseware and delivery by focusing on outcomes-based education (2006b).

This paper presents the experiences of an information technologist in education, who is a trained assessor as well as a course developer for some of the SAQA qualifications. These experiences were gained from the end of 2004 until early 2006, a period during which the NMMU Information Technology Department was sub-contracted as a service provider to offer two learnerships in a project coordinated by Mr Danie Vlok at the University of Fort Hare. Some individuals (including the first author of this paper) were also contracted to develop courseware for the offering of these learnerships.

The methods reported on in this paper (as used in the design of the courses) are structured with the aim of focusing on the final assessment of the qualification and its contents viz. unit standards. The paper also presents suggestions regarding the management of the assessment results, and the preparation of the learners' portfolios.

Notably, the Department of Education and the Department of Labour, in 2003, as cited in Blom (2006b) acknowledged three types of qualifications, viz:

- where learners first get a discipline-based qualification followed by structured practice in the work situation, or
- where traditional models such as technikons or universities of technology integrated the practice with the coursework, or
- the new learnership programmes where the theoretical component is fully integrated with the occupational programme.

The afore-mentioned learnership programme is the one where a more detailed example of implementation will be given in this paper. One of the central principles to the NQF is that education and training should be integrated, and that a learner should be able to accumulate credits towards a qualification (Van Rooyen, and Prinsloo, 2002). The learnership programme enables learners to apply what they have learnt (Blom 2006a).

This paper continues now with a presentation of how to prepare courseware for this, and how to manage the assessment thereof.

Developing Course Material

This section begins with a short explanation of the credit-bearing unit standards of a typical qualification, followed by a suggestion as to how the course material can be put

together. As mentioned above, to develop course material for a SAQA qualification, the approach at NMMU Information Technology department, was to focus on the required outcomes and assessments thereof that would take place. By focusing the delivery and course material in this manner, one can see from the start, what the objectives are for each task that is planned to follow on the material, what shall be accomplished in the task, and how the task will be assessed once it is submitted.

Layout of Qualification Standard

A typical SAQA qualification has a layout comprising at least the following (Bezuidenhout, n.d.; Gerber, Boshoff, Bezuidenhout, and Blunt, n.d.; Van Rooyen, and Prinsloo, 2002):

- Relevant title information and minimum number of credits

- Purpose and rationale of the qualification

- Learning assumed to be in place and recognition of prior learning

- Qualification rules that include the specialization list of unit standards within the qualification, the minimum number of credits from each of fundamental, core and elective outcomes. Typically all fundamental and core outcomes are compulsory, and the electives are grouped so that a particular group of electives may be chosen in order to add a unique focus to the qualification. For example, one may wish to choose a specialization of "Hardware and Infrastructure support for Personal Computers" instead of "Data Communications and Network Support" in which case there is a particular set of electives that are aimed at the former.

- Exit level outcomes to state what a "learner will be able to do"

- Assessment criteria

- International compatibility and other general information

Each unit standard that is suggested by the qualification, is further described in its own document, and some of the relevant detail is listed below (Bezuidenhout, n.d.; Gerber, Boshoff, Bezuidenhout, and Blunt, n.d.; Van Rooyen, and Prinsloo, 2002):

- Specific outcomes to be assessed

- Assessment criteria to be used as a measure for evaluation

- Optional range of content to be included for the purposes of assessment

- Cross-curriculum field outcomes

The intention of the next section is to provide a simplified step-by-step process to be followed in order to produce courseware for a typical qualification and its unit standards.

Step-by-step course material development

For the preparation of the course material, it may be useful to lay out a plan of action to be followed, such as was adopted by the NMMU Information Technology department:

1. Decide on the SAQA qualification to be offered and obtain the exact details from the SAQA website. Once the overall content is known, it may be possible to map it to an already existing qualification delivery. The mapping must be done to a very low level of detail. An example of the mapping for one single assessment criteria within one specific outcome for one given unit standard is shown in Figure 1, but one must bear in mind that the mapping can go to an even lower level such as a given range of expected content to be included in the assessment. Further columns ("Course x Mapping") can be added depending on the number of references that the material is sourced from.

Unit Standard Component	SAQA US ID No.	Unit Standard Description	Outcome Number x of y	Assessment Criteria Number z of x of y	Credits for this US	Course 1 Mapping	Course 2 Mapping
Core	14963	Investigate the use of computer technology in an organisation	Plan an investigation of the use of computer technology in an organisation	The plan identifies the scope and objectives of the investigation.	6	IT Essentials I v.3 Chps 1.2 to 1.4	HP IT Ess 1 Manual pages 14-51

Figure 1: Extract of mapping a unique assessment criteria

2. Before developing the course material for any qualification, it is important to consider what the main focus will be, in order to choose the correct electives. Therefore, within the qualification, choose the set of unit standards to be offered. Confirm that sufficient credits are used for the qualification.
3. Group the chosen unit standards into modules such that a particular module can be named to describe the set of unit standards within that module. It is likely that there will be a number of general focus areas (eg "Hardware" and "Life Skills") within the qualification, such that one can group into modules.
4. Order the modules such that logical progression is made when delivering them in succession.

5. Plan the delivery of the qualification. Figure 2 shows a simple extract of a year plan that can be drawn up to indicate what is to be done in each month. By examining the number of credits expected, one can decide how the hours are to be used. If a particular unit standard is worth 8 credits (80 hours) then one may decide that 20 hours will be spent in the classroom and 60 hours at the workplace. One week of each month may be spent in the classroom, and the other three weeks at the workplace.

MONTH	TOPIC	CREDITS
February	Assessment of Unit Standard 114050 and 114056	
	Cisco IT Essentials II - Chapter 1	
	Cisco IT Essentials II - Chapter 2	
	Unit Standard 8252	6
	Unit Standard 114055	3
	Unit Standard 114051	4
March	Assessment of Unit Standard 8252, 114055 and 114051	
	Cisco IT Essentials II - Chapter 3	
	Cisco IT Essentials II - Chapter 4	
	Unit Standard 10135	8
	Unit Standard 114059	5

Figure 2: Extract from a Year Plan

6. For each unit standard, collect the list of source material that covers the work. It must be noted at this stage, that the overall qualification was first thoroughly examined and subsequently mapped in detail as shown in the extract in Figure 1.

7. Prepare the courseware material for the unit standard. A top-down approach to this material can be seen in Figure 3. The learner guide contains everything that the learner needs. It is a workbook containing all material or references thereto, and all task details including laboratory work to be done. It can also be used by the facilitator, assessor and mentor. The assessment guide is used extensively by the learner to assist him/her in planning for assessment either in the classroom or in the workplace. The learner will typically pull out the particular assessment tool from the guide, and attach it with the appropriate task to be handed to the assessor, and will eventually be filed correctly in the learner's portfolio. The facilitator guide is used by the facilitator only, and contains model answers and other information required by

him/her. The mentor guide is submitted to the mentor at the workplace and should contain model answers for the workplace assignments and other relevant information.

				Learner Guide	**Facilitator Guide**	**Assessment Guide**	**Mentor Guide**
				List of relevant Material/Books			
				List of Unit Standards in this module			
Unit Standard *nnnnn*	Expected Outcome 1	Assessment Criteria		Detail of delivery			
				Source of external content			
				List of supplementary material			
			Assessment criteria 1 and optional range of content	Tasks for classroom and workplace	Guide notes and answers for the classroom exercises	Rubrics, checklists etc	Guide notes and answers for the workplace exercises
			Assessment criteria 2 and optional range of content	Tasks for classroom and workplace	Guide notes and answers for the classroom exercises	Rubrics, checklists etc	Guide notes and answers for the workplace exercises
			Assessment criteria 3 and optional range of content	Tasks for classroom and workplace	Guide notes and answers for the classroom exercises	Rubrics, checklists etc	Guide notes and answers for the workplace exercises
			Joint tasks for expected outcome 1	Tasks for classroom and workplace	Guide notes and answers for the classroom exercises	Rubrics, checklists etc	Guide notes and answers for the workplace exercises
	⋮						

Figure 3: Extract of suggested plan for manuals

8. The actual low-level development of the course material involves something like the following for any individual assessment criteria:
   - Plan the delivery of the theory content

- Design tasks and assessment instruments, focusing in particular on the relevant assessment criteria. Any qualified assessor should be able to plan these well, having attended the training (Gerber, n.d.; Boshoff, and Blunt, n.d.).
- Confirm that the planned delivery, the task duration and other environmental and external factors are suitable for the amount of time allocated to this section of the unit standard.
- Consider also whether the task in question is to be done in the classroom or during the three weeks at the learner's workplace.

Once the courseware material is ready, the learners are able to begin their training. They arrive on site at the institution, and the assessor is ready to assess their progress when they submit tasks. The control and management of the tasks and assessment results are described in the next section.

Controlling Assessment results

Much can be said here about assessment of work done by the learners, but it is beyond the scope of this paper. Therefore the paper only discusses the methods used by NMMU Information Technology department to control the numerous paperwork and evidence needed for assessment. It was realized early on, that the assessment process grows in leaps during the year, as learners continually are found "not yet competent" and therefore return again later for further assessment. These repeated assessments coupled with the new assessments planned for that period tend to magnify the assessment process. By the end of the year, the assessor will be assessing more and more each month, and giving more and more feedback. Proper recording mechanisms are required (Gerber, R.E., & Boshoff, H. n.d.)

Methodology used to facilitate assessment

As mentioned earlier in the paper, the courseware focuses on the outcomes and the assessment criteria. If the learner is declared competent in the tasks, then he/she can be found competent for that particular assessment criteria or outcome and so on. Putting all expected outcomes together within a unit standard, would then simply require an overall check and a decision as to whether the learner was competent for that unit standard.

To control the assessment process, there are checks and balances in many places. This means that at any time, during the year, all parties know of the status for each learner, simply by looking in the learner's portfolio for the relevant assessment forms. Each and every task expected by the learner guide is to be completed by the learner, submitted by him/her for assessment, marked by the facilitator or mentor, assessed by the assessor and gathered into the portfolio. The first form used each month is to sign off each and every piece of task evidence that is submitted for assessment. This is to ensure that nothing is lost by accident. The assessor takes responsibility for that piece of work from that moment on. Figure 4 shows a typical extract of a form that may be signed by the assessor or facilitator when the tasks are handed in. This form is kept in the portfolio at all times.

Module: Hardware	Related Exercises	Classroom or Workplace	Signature of Assessor
Unit Standard: *nnnnn* **Explain computer architecture concepts**	Exercise 2.1.2.1	C	
	Exercise 2.1.2.2	C	
	Exercise 2.1.2.3	C	
	Exercise 2.1.2.4	C	
	Exercise 2.1.2.5	W	
	Exercise 2.2.2.1	C	
	Exercise 2.2.2.2	C	
	Exercise 2.2.2.3	W	

Figure 4: Extract of submission form for tasks

The next useful form(s) seen by the assessor will be the rubrics, checklists or other types of forms used to assess the learner's competence. These assessment forms are in actual fact used by various parties as follows:

- The learner uses it as a guideline of how assessment will be done when he/she focuses on performing the task.
- The facilitator or mentor will use it to evaluate the work done.
- The assessor will use it for the final assessment of the learner's progress.

These assessment tools are attached to the appropriate tasks before being filed for assessment.

The next form that is used in assessment is prepared and completed by the assessor when assessing the unit standard, once all relevant tasks and assessments have been collected. The assessor will consider all the evidence and complete a form similar to the extract shown in Figure 5. This will provide up-to-date information as to whether the learner has been found competent or whether further iterations (re-assessments) are required. Whereas progressed is tracked on the level of exercises completed by the learner, competence is achieved for the unit standard as a whole. The form will be presented to the learner when providing feedback to him/her. It should be very easy to see at a glance on the form, which areas have not been mastered by the learner.

Summative Assessment

Qualification	Technical Support
Unit Standard ID	*nnnnnnn*
Assessment Result (C / NYC)	
C = *Competent* *NYC* = *Not Yet Competent*	

Learner First Name	**Learner Surname**

Unit Standard Title	Demonstrate an understanding of xxxx xxxxx xxxxx	
SAQA Level	3	**Unit Standard Type** Elective
SAQA Credits	6	**Total Hours** 60

Tasks

Specific Outcomes	Assessment Criteria	Related Exercises	Type *C = Class* *W = Work*	Remedial Action		Date of Re-assess-ment	Date of Re-assess-ment	Date of Re-assess-ment
1. Demonstrate an understanding of the use of preventive maintenance measures and procedures. (Demonstrate an understanding of the use of preventive maintenance measures and procedures of computer hardware).	1. The demonstration identifies the causes of computer hardware maintenance. (Including, but not limited to: Over heating, Dust, Electrical Spikes, Thermal creep.) 2. The demonstration covers preventive measure for the causes of computer hardware maintenance. (Including, but not limited to: Ventilation, Liquid cleaning compounds, Uninterrupted Power Supply (UPS).)	Exercise 1	C	Y	N			
		Exercise 2	C	Y	N			
		Exercise 3	W	Y	N			
		Exercise 4	C	Y	N			
		Exercise 5	W	Y	N			

Figure 5: Extract of a Unit Standard Assessment form

At the end of this form, additional exercises recommended by the assessor may be listed, plus signatures, dates and comments. One can also see that there is a facility for repeated re-assessments. Basically this form may be used as follows: print it out once; use it during assessment to fill in the necessary details and sign it; return to the portfolio for discussion with the learner; and use it again for each subsequent assessment of this unit standard. In this way, the progress can be seen. By the time the unit standard has been signed off completely as competent, there may be various entries on the form according to evaluation done on different assessment dates. The form becomes a "tell-it-all" for the particular learner's progress in a particular unit standard.

The NMMU has found that learners are complacent and should be encouraged to pro-actively work towards completing their portfolios, else it will cause congestion of work effort towards the end of the year. Therefore, to encourage the learners to stay abreast and in control of their progress, the assessor also provides a quick list of all outstanding exercises each month. The learner sees therefore, at a glance, that certain exercises are not yet completed or not yet handed in and are therefore still expected to be received by the assessor as soon as possible. This report can perhaps be generated for the individual learner, by editing the file described in Figure 7, pulling out the detail for an individual learner.

By the end of the learnership, the assessor will have a final report, showing a summary of progress in each unit standard within the qualification for a learner. This summary of progress can be prepared as shown in the example in Figure 6. Actual progress dates for each unit standard can be copied directly from the learner's individual forms as shown in Figure 5.

UNIT STD	CREDITS	NOT YET COMPETENT	NOT YET COMPETENT	NOT YET COMPETENT	COMPETENT
nnnnnn	7		27th Aug 2005	10th Sep 2005	23rd Sep 2005
nnnnnn	5				21st Jun 2005
nnnnnn	8		5th May 2005	21st Jun 2005	26th Jun 2005
nnnnnn	3				11th Feb 2005
nnnnnn	5			21st Jun 2005	29th Jul 2005
nnnnnn	9			27th Aug 2005	10th Sep 2005
nnnnnn	9	12th Aug 2005	10th Sep 2005	12th Sep 2005	23rd Sep 2005
nnnnnn	6		10th Sep 2005	12th Sep 2005	23rd Sep 2005

Figure 6: Extract regarding all unit standards from a learner's overall progress form

There are other forms that the assessor uses internally to keep track of the progress of each learner in every task. For example, Figure 7 is a comprehensive electronic form that is kept up-to-date for the duration of the learnership. Each month, as an exercise is assessed and graded, the entries are made into this electronic form.

UNIT STANDARD	CREDITS	TASK NUMBER	Learner 1	Learner 2	Learner 3
US *nnnnn*	11	2121	2	2	2
		2122	2	2	2
		2221	4	2	3
		2222	2	4	3
		2223	2	2	2
		2321	2	2	3
		2322	2	3	3

Figure 7: Extract from comprehensive list of all tasks for all learners

Various checks and balances are made from these, such that summaries exist within the spreadsheet, to show at a glance, how many unit standards are competent, how many not yet competent, how many tasks are completed, how many are still not handed in, and how many are flagged for re-assessment, and so on. These results can be seen per learner, as well as overall.

This concludes the discussion of the forms used by the NMMU Information Technology Department to control the assessment process. There may be others that one can use, and there may be different opinions as to what can work for an assessor.

Lessons Learnt

While this paper focused on presenting an overview of methodical approaches which were used successfully by the NMMU IT Department, it would be apt to briefly state some problems experienced and lessons learnt. These will be categorized according to the two major areas addressed in this paper, viz, development of course material and assessment. Note that the intention is not to critique the learnership as a whole, only to highlight some pertinent issues.

- Course material

  The course material can either be developed, offered and assessed strictly according to the unit standards, or developed and offered according to a (perceived) logical flow of material with the assessment delayed until a later stage, when whole unit standards have been completed. For this project, the first approach was selected, with a clear benefit attained regarding the assessment process. However, some concerns were noted over the course of the learnership regarding the logical progression of material (as relating to the timing of the offering and the learners' perceived comprehension at the time). It was felt that some parts of the material could have been offered in a different order. This approach could be taken, but with careful consideration to the influence on assessment. If material is offered and assessed according to some preferred logical progression (while disregarding the structure of the unit standard), it becomes difficult for the assessor to "see" all evidence relating to a particular unit standard, properly grouped together.

- Assessment

  A skills-based qualification focuses on "doing" and not memorizing. Therefore the student must "show" that competence has been achieved and indeed is offered multiple opportunities to show such competence. The learners typically spend 70% - 80% of their time in the work environment; therefore it follows that much of the required competence must be attained at the workplace. The approach to assessment is therefore structured accordingly (ie a large percentage of exercises must be completed in the work environment). Regrettably, this approach is derailed if the learners' mentors are not able to assess the competence of the learners in the workplace, either because they are not trained or educated, or because they simply do not have the time. However, this part of the assessment cannot simply be disregarded and this predicament therefore translated into more time spent in the classroom to assess learners' competence (eg through simulation exercises). Paper-based exercises not assessed by the mentors simply become the responsibility of the facilitator (or additional resources must be allocated).

These (and other) issues were encountered as part of a significantly elevated learning curve while the Department was offering learnerships for the first time. However, they

are not insurmountable and will go a long way towards informing a next round of learnerships.

Conclusion

Throughout the year, the NMMU Information Technology Department was in control of the process of the learnership. The course material focused on the structure of the qualification and its composite unit standards. Within the unit standard details, the outcomes and assessment criteria were clearly demarcated, making it easy to focus on the deliverables. This facilitated the usually cumbersome task of the assessor. Forms were designed to further simplify and streamline the assessment process. It has been seen in the past how portfolio preparation seems to be the major drawback as far as completing a learnership is concerned. The methods adopted by the NMMU Information Technology department facilitated this procedure. What may have been a mammoth task was made comfortable by its co-ordination and by the commitment of everyone concerned.

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