

# **A NEW EDUCATION FRAMEWORK AND THE IMPACT ON VOCATIONAL QUALIFICATIONS OFFERED BY SOUTH AFRICAN COMPREHENSIVE UNIVERSITIES AND UNIVERSITIES OF TECHNOLOGY**

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## **Abstract**

Over the past 35 years Engineering Education in South Africa has changed substantially in an endeavour to supply the country with skilled technical manpower. These changes dealt mainly with Institutions offering Vocational type qualifications such as Colleges for Advanced Technical Education (CATE) pre-1970's later replaced by Technikons in the mid-1970's, rather than the Traditional Universities. Technikons were again renamed as Universities of Technology during 2005 causing much confusion in the engineering fraternity, as no sooner had industry understood the new system then, changes would again be brought about. Qualification names had also changed with each Institutional name change and this is about to happen again with the new Qualifications Framework proposed in 2004 and promulgated in October 2007.

In this promulgated document one framework is proposed for all Higher Education Institutions (HEI's) offering tertiary education. It spells out all qualifications that may be offered by HEI's as well as the minimum and maximum credits required at the entry and exit levels. However, a substantial challenge exists for Universities of Technology and Comprehensive Universities in unpacking curriculum for Vocational Qualifications resulting from an 'interim measure' that has been put in place by the Department of Education. This interim measure states that: 'a maximum of 50% credits of a completed qualification may be transferred to another qualification, provided that no more than 50% of the credits required for the other qualification are credits that have been used for a completed qualification'. Another requirement is that HEI's will now be responsible for placing students in industry for completing their work-based learning, if they wish to include such a component in their curriculum. Previously, HEI's were not responsible for the work-based learning component which is an essential part of the curriculum, as the qualification may not be awarded without the successful completion thereof.

This paper deals with these two aspects as mentioned above and proposes strategies on how to overcome these challenges when the new dispensation comes into effect on 1 January 2009.

## **Keywords**

Higher Education Qualifications Framework (HEQF), curriculum, vocational qualifications, work integrated learning (WIL), Engineering Council of South Africa (ECSA), South African Qualifications Authority (SAQA), National Senior Certificate (NSC)

## **1. INTRODUCTION**

The University of South Africa (Unisa) is the only accredited Open Distance Learning (ODL) Higher Education Institution in South Africa with a student base exceeding 230 000 and considered one of the mega universities internationally. At Unisa, engineering students number approximately 25 000 annually. The reason for this large number of students is the fact that the majority are working class citizens who are unable to attend full time classes. There are also a large number of students that drop out from universities due to whatever reason but wish to complete their studies towards an engineering qualification. Another reason could be the lower class fees at Unisa.

It is therefore imperative that Unisa develops a Programme Qualification Mix (PQM) that will suit all students studying engineering courses and that come from different residential institutions. Not only is the PQM important but equally important is the course content of the various qualifications offered by Unisa. These should be similar so as to afford students maximum credits (exemptions) when transferring to Unisa. The maximum exemptions that may be awarded is 50 % of the course content.

The concern in developing the PQM and course content is that this needs to be done well in advance for an institution as huge as Unisa because of logistics. This in fact implies that Unisa will be leading the direction taken with respect to engineering qualifications in South Africa whereas we should be lagging this process in order to ensure a more similar curriculum of other institutions for our courses. On the other hand, the Engineering Council of South Africa (ECSA) who accredits engineering qualifications at all Higher Education Institutions in South Africa also make certain recommendations but they too have not finalised their requirement with respect to the new dispensation commencing 2009. This places Unisa in a unique position as no guidance can be sought despite engaging with these bodies as well as with other HEI's.

Finally, a synopsis of the past and current PQM status at Technikons and the now Universities of Technology are explained and a proposed PQM considering the new Higher Education Qualification Framework (HEQF) [1] for Unisa is highlighted.

## **1.1 PAST AND CURRENT QUALIFICATION STRUCTURES (FRAMEWORKS)**

### **1.1.1 Technikons (1974 – 2005)**

Since early 1970's Technikons replaced the Colleges for Advanced Education (CATE) and the so-called 'T' level courses were established. Such courses together with the involvement from industry were known as Co-Operative Education which implied that students underwent 6 months theoretical training at a technikon followed by 6 months industrial training. On completion of the course students were awarded with a National Diploma (T3 level – 3 year qualification) and the National Higher Diploma (T4 Level – 4 year qualification), that was deemed necessary to bridge the 'gap' between professional engineers and artisans. This system was well structured and supported by industry.

In the 1980's the system changed to the so-called 'S' level courses which allowed students, whether employed or not, to enter technikon type education. The main difference was that students could complete the theoretical component of two years before undergoing one year of industrial experience. This was initially known as Experiential Learning and later Work Integrated Learning (WIL). However, after completing the 'S' level course students were rewarded with a Diploma (3 year qualification) only, which implied that students had to complete a similar curricula to the T4 level as was previously offered for the National Higher Diploma. To provide students progression to a Master's (MTech) and Doctorate (DTech) qualifications, a Bachelor of Technology (BTech) degree was introduced and considered as a 4 year qualification.

### **1.1.2 Universities of Technology (2005 – present)**

During 2005 the Department of Education rationalised and reduced the number of Higher Education Institutions in South Africa. This led to the merging of certain Technikons and Technikons with existing Universities that did not offer engineering. This in turn also introduced new names for these institutions, i.e. Port Elizabeth Technikon with the University of Port Elizabeth which was renamed, Nelson Mandela Metropolitan University. All Comprehensive Universities at the time retained their identity, i.e. University of Pretoria, University of Cape Town, etc. Although the Technikon of South Africa (TSA) merged with the University of South Africa (UNISA), both distance learning institutions, the name UNISA was retained. Amidst these changes, the technikon type qualifications had not changed. A Senior Certificate (matric) with a pass mark of 50% for Mathematics, Science and English were and are the admission requirements for the technikon and universities of technology type qualification, i.e. the Diploma.

### 1.1.3 Universities

As previously indicated, all Comprehensive Universities remained unchanged with a few universities that merged with other universities. It should be pointed out that the qualifications offered by these universities had not changed and in the new dispensation will also not change. Admission requirements are a Senior Certificate (matric) with matriculation (university) exemption in order to register for the B Eng or BSc (Eng) qualification.

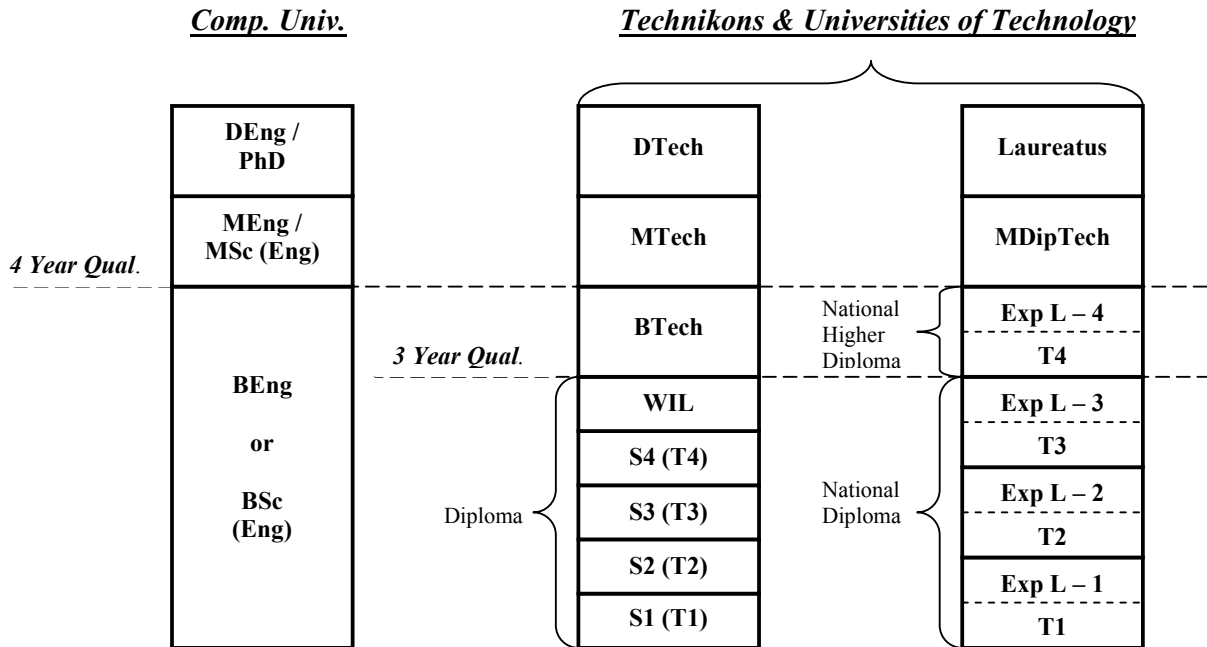


Fig 1. Diagram of Qualification Structures (Frameworks) – Past and Current.

## 1.2 NEW QUALIFICATION STRUCTURE (FRAMEWORK) – January 2009

From January 2009 the new qualifications structure commences, this new structure is with respect to Programme Qualification Mix (PQM) as well as the total notional study hours per year per course. In this instance, the total number of notional study hours will be 1200 with 10 notional hours being an equivalent of 1 credit [1]. In the case of Unisa, this would resolve in 10 subjects/modules of 12 credits each, equalling 120 credits or 1200 notional hours. Hence a 3 year BSc degree will equate to a 360 credit qualification and 1 year Higher Certificate Course, a 120 credit qualification. Admission to courses offered by HEI's is the National Senior Certificate (NSC) with different ratings (% passes).

Implementation of the new structure also provides new National Qualification Framework Levels up to Doctorate level, i.e. a doctorate will in future be a NQF Level 10 qualification and a four year BEng degree, a NQF Level 8 qualification. Hence, a first year course will be considered at NQF Level 5, second year studies, NQF Level 6, etc [1].

In many instances the re-evaluation of subject/module matter will need to be undertaken. For this purpose the credit values of current subject/module matter will first need to be established by using the Kilfoil Model [3] as related to Open Distance Learning (ODL) [correspondence] courses. To ensure that subjects/modules are around 12 credits, additions to- or removal of- sections within the subject/module may need to take place.

Once this has been established the necessary forms would need to be completed and submitted to the South African Qualifications Authority (SAQA) for subject/module registration purposes. For

Universities of Technology, this is where the major task lie, i.e. in upgrading subjects/modules to a higher National Qualifications Framework (NQF) level than what currently exists.

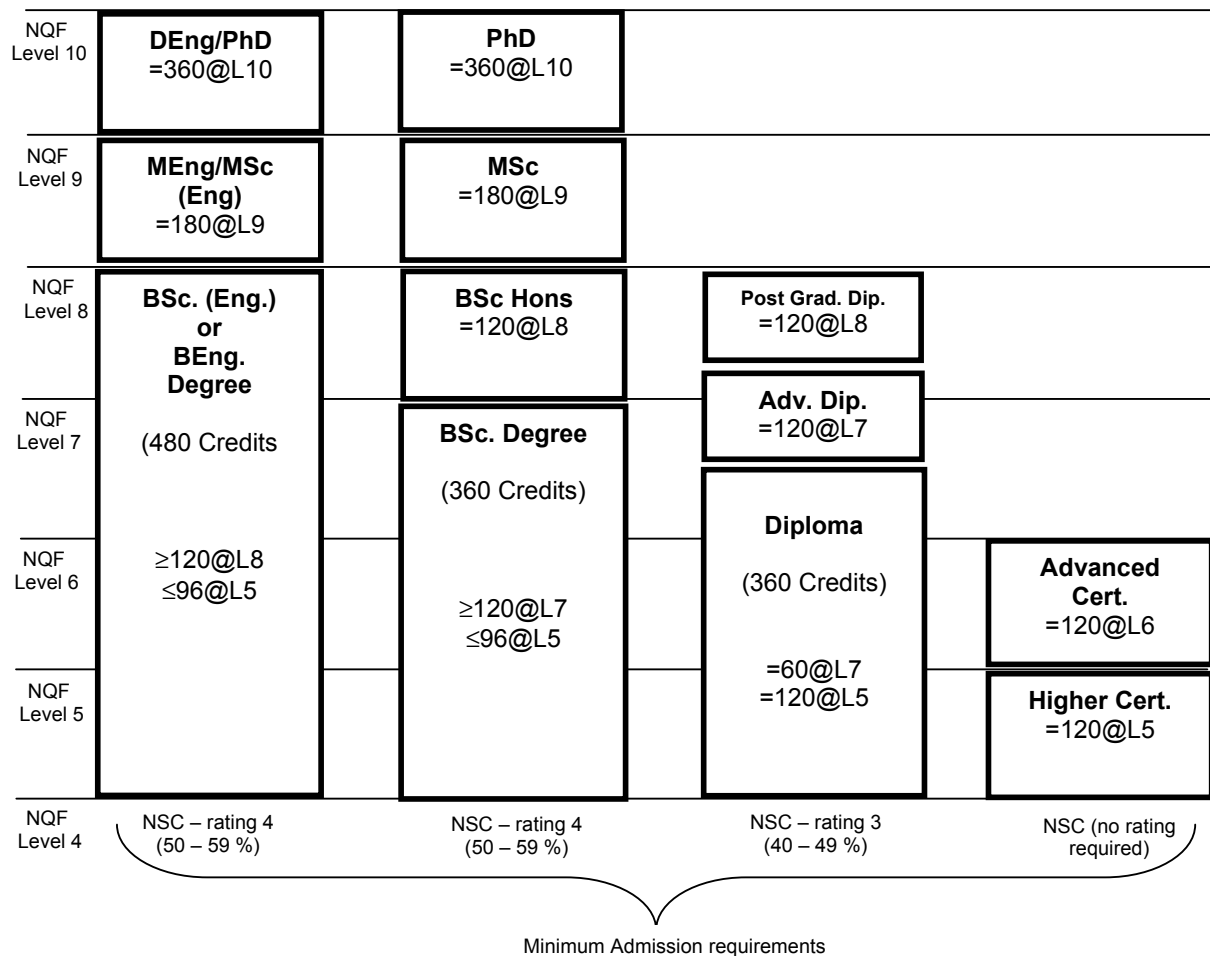


Fig 2. New Qualifications Structure (Framework)

From Figure 2 and for the purposes of this paper, discussions will be restricted to the: Higher Certificate, Diploma and the 3 year BSc degree.

### 1.2.1 Higher Certificate (HC)

This qualification will primarily be vocational or industry orientated providing basic introductory knowledge for further studies with the emphasis on general principles and applications. Typically, the Higher Certificate includes a Work Integrated Learning (WIL) component. Completion of the Higher Certificate meets the minimum entry requirement to an appropriate Advanced Certificate (AC). Credits accumulated may also be presented for admission to a cognate Diploma only. – [1].

**Discussion:** As the qualification is vocational or industry oriented part of the 10 modules will need to be workshop based. This will imply that the WIL components will in turn need to be structured into 12 credit modules and approved by SAQA. Currently WIL is not accredited by SAQA. This aspect alone poses a huge challenge on HEI's. Although progression to the Diploma is permissible, the minimum admission requirement may be problematic as institutions may allow scholars to register for this qualification having a rating lower than 3 [4]. The HEQF document mentions the fact that a Higher Certificate may be presented for admission to the second year level of a Diploma. However, an interim measure prohibits such progression in that only 50% of a completed qualification may be

transferred to another qualification, provided that no more than 50% of the credits required for the other qualification are credits that have been used for a completed qualification [1].

### 1.2.2 Diploma

The Diploma could be professional, vocational or industry orientated and will be characterised upon the type of curriculum. This qualification is to develop graduates with focused knowledge who can demonstrate the necessary skills as required of a technician. Accreditation of the programme is conducted by the Engineering Council of South Africa (ECSA). The curriculum for the Diploma is designed in conjunction with Vocational and Industry developed programmes will include WIL components. The completion of a Diploma meets the minimum entry requirement for admission to an Advanced Diploma or to a Bachelor's Degree. Accumulated credits may be presented for admission into a cognate Bachelor's Degree. No qualification may be awarded for early exit from the Diploma programme. – [1].

**Discussion:** Somewhat confusing is that the minimum admission requirement for a BSc degree is either a Diploma or a NSC having a rating of 4. The question is, does the candidate meet the minimum requirement for a BSc degree because initially the candidate with a rating of 3 only qualifies for entry to a Diploma? Although the Diploma is a 360 credit qualification it is not equivalent to a 3 year qualification, hence it is felt that students would be undertaking the same work as for a BSc degree but will not be receiving the same recognition. The same interim measure as indicated for the Higher Certificate applies to the qualification.

### 1.2.3 BSc 3 year Degree

The purpose of this qualification would provide graduates with a well-rounded broad education. It will equip them with a knowledge base, theory and methodology, enabling them to demonstrate initiative and responsibility in an academic or professional career. Principles and theory are emphasised for entry into the labour market, professional training or post-graduate studies. Accreditation of the programme is conducted by the Engineering Council of South Africa (ECSA). Progression to the BSc (Hons.) degree or Post-Graduate Diploma is possible after completion of this degree. No qualification may be awarded for early exit from the BSc programme. – [1].

**Discussion:** The minimum requirement for the current Diploma is 50% which is now the minimum requirement for the BSc degree. What is clear from the HEQF document is that HEI's must not set students up for failure, yet the entry requirement for both the Diploma and the BSc degree in the new dispensation will in fact be lower than what was previously required.

## 1.3 PROPOSED STRUCTURE FOR ENGINEERING

As the HEQF document has only recently been promulgated not many engineering faculties/colleges at HEI's have considered the implications thereof as this is only evident when attempting to unpack the curricula of these various qualifications. It is because of this fact and aspects mentioned under 1.2 above that the following PQM is proposed.

It should be pointed out that Science and Mathematics of school leavers have over the past two decades not been up to standard and hence HEI's developed bridging type courses to assist students to acquire a better understanding of these two subjects. It is anticipated that the standard of these two subjects under the new NSC would not be improved and hence, not to set students up for failure the proposed route would be the Higher and Advanced Certificate and the 3 year BSc degree programmes with progression to the BSc Hons, MSc and PhD.

Referring to Fig.2, the intention is to route all students through the Higher Certificate course of which the curricula will consist of Access Mathematics, English, Science, and some basic engineering and WIL modules. For engineering a good science and mathematical foundation is paramount and it is felt that this cannot be achieved within 8 modules (max. 96 credits) as stipulated under the BSc degree because certain proficiencies at first year level are recommended by ECSA. This curriculum will also not form part of the first year BSc degree course. Admission to the Higher Certificate will be a rating of 4, i.e. 50% or better and not the recommended rating 3. After completion of this course students

can progress to the Advanced Certificate if their average pass mark is between 50 and 55 %, or the BSc degree if their average pass mark is above 55 %, for the HC. Students progressing to the Advanced Certificate will study a curriculum that will ensure a 50 % credit transfer (5 modules at NQF level 6) when or if they wish to pursue the BSc Degree qualification. Also, on completion of the AC students can apply to the ECSA for technician in training status.

The Diploma will not be considered because of the 360 credit requirement which is the same as that for the BSc 3 year degree, yet is not considered equivalent to a 3 year qualification which is rather unfair. Students will only be considered for technician status by ECSA after completion of this qualification, the same as those that have completed an Advanced Certificate which is a 2 year qualification.

Initially the BSc 3 year degree is the preferred option as mentioned on a number of previous occasions. This will allow Unisa to assist students that have either dropped out of residential institutions or for those who have found permanent employment and who wishes to complete their studies. The intention here is to set a curriculum similar to that offered by the Universities of Technology (UoT) so that all engineering students would be catered for. As a result of the limited first year modules, no student will be allowed to register for the BSc 3 year degree without having completed a Higher Certificate, i.e. the pre-requisite for admission to the BSc 3 year degree will be the HC. This should provide an engineering student with the necessary foundation that ensures successful completion of the qualification.

Finally, the intention is to develop WIL into 12 credit modules for inclusion into the main curricula. This will be a major challenge requiring much deliberation with service providers in developing these modules for approval by SAQA. The general opinion is that the WIL component under the old Diploma was paramount to the successful acquisition of employment by students and hence should be retained in the curriculum even if in different form. This will ensure that HEI's need not have the burden of having to place students in industry [1], as the WIL components will be in the form of modules.

## 1.4 CONCLUSION

- Many challenges exist in developing curricula for the qualifications as proposed above keeping in mind the 50% transfer rule and the fact that no progression to the BSc degree from completing a HC is permissible unless the admission requirements have been met.
- Components of WIL should and must be incorporated into the curricula for the HC, AC and the BSc to ensure work readiness of students.
- It is hoped that migration from the old Diploma to the new BSc degree would be permissible if the subject matter of modules could be kept similar.
- It is believed that by routing all students through the HC before being allowed to register for the BSc degree will improve the success and throughput rates of students.

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