

# **A SURVEY OF THE GENERIC GRADUATE SKILLS THAT THE CENTRAL UNIVERSITY OF TECHNOLOGY RADIOGRAPHY GRADUATES NEED FOR THE WORLD OF WORK**

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## **ABSTRACT**

The issue of Generic Skills has received considerable attention over the past few years as universities, in their response to calls for accountability, need to articulate and demonstrate the achievement of these (Barrie, 2005:1). In recent years, employers and their representatives consistently demand that their employees must possess a range of personal and intellectual attributes. These include attributes beyond those traditionally made explicit in programmes of study in higher education institutions (Harvey, 2000:7). Universities describe these graduate qualities differently, resulting in a variety of terms used to target the same attribute (Barrie, 2006:218). This diversity of descriptions prompts questions as to the extent to what stakeholders in the Radiography programme understand by the term generic graduate skills. One of the major goals was to explore what the stakeholders involved in academic and work-based learning as well as radiography students identified as generic graduate skills radiography students must obtain during their studies to prepare them adequately for the world of work. Findings from this study agreed on the importance of higher education to be informed of expectations from employees in order to respond to the need of preparing students adequately for future job tasks and contributions to society. In addition to this, the study also identified the particular generic skills stakeholders regard essential for students entering the profession.

**Keywords:** Generic graduate skills, Radiography

## **1. INTRODUCTION**

The identification and development of graduate attributes, also known as generic skills, have become a focal point in higher education worldwide since the call for universities to demonstrate the quality of their outcomes and processes (Barrie, 2006:215). Kivinen and Ahola (1999:201) attribute it to globalization and the introduction of new technologies, which brought about profound changes in the world of work. In higher education globally, this changing environment requires highly skilled individuals who uplift themselves throughout their lifetime while remaining globally competitive. What possible impact could this "new pace of change" have on higher education institutions in South Africa? Since 1994, South Africa has located itself within this network of global exchanges and interactions which immediately initiates the question: What generic skills are needed from South African graduates in a rapidly changing society?

## **2. GENERIC SKILLS**

According to Teichler (1999:308), institutions of higher education and responsible governments, in order to reflect on the future challenges from the world of work, are clearly in need of improved information on employment and the work of graduates. (Harvey (2000:6) notes that employers are becoming less concerned about the field of study and more in the raft of skills complementing a first degree, implying that subject-specific knowledge is no longer the primary determinant of suitability for employment. Emphasizing the need for the development of critical, flexible, reflective and empowered learners raises fundamental questions about the relationship between higher education and the world of work. The relationship between the academy and employment could risk the erosion of academic freedom, causing academics to be suspicious of closer links to business (Harvey, 2000:4). It becomes clear that the employer-higher education interface has become a complex nexus that needs to address organisational structures and missions on the one hand and graduate attributes, such as intellectual, transferable and personal skills, on the other. Higher education institutions therefore need to become well informed of expectations from the outside world in order to define its own role with regard to the employment patterns of graduates.

Teichler (1999:297) states that very few studies have been undertaken to monitor the changes of graduate employment and work, and blame it on inadequate information in countries with unstable employment prospects for graduates and the unbalanced and biased information on graduate employment. In spite of this information shortage, a policy of diversification in higher education is advocated as a possible way of addressing the changing situation of graduate employment and work. This is based on the assumption that a growing diversity of students, talents, motives and career prospects may better be served by a diversity of institutions of higher education as well as the diversity of course programmes.

The effort to develop intellectual and generic skills in students as well as knowledge about how organisations work is based on two assumptions: firstly, the development of graduates in this manner will improve their performance in the labour market, and secondly, it will make graduates more attractive to employers (Ntshoe, 2004:215). Employer involvement in the development of students, on the other hand, confers additional benefits. It makes learning more meaningful to the student and brings a wealth of "real world experience" into the learning environment (Laybourn, Goldfinch, Graham, Macleod and Stewart, 2001:368). Recognition of the responsibility of higher education to prepare graduates who are able to manage and respond effectively to change and its inherent demands, prompted considerable debate within educational, employer and political spheres. The debate focuses on the generic skills expected of students, and how these might be fostered (Sumsion & Goodfellow, 2004:329). Recently, a popular strategy of higher education institutions is to publish a list of the generic skills that they expect graduates from their institution to acquire.

Most probably to clarify the nature of the education they offer to their students, and in doing so, also to clarify their graduates' potential contribution to society (Barrie, 2006:215).

For many years authors such as Harvey and Teichler have been critical regarding the lack of a coherent theoretical model underpinning the generic skills agenda. Barrie (2005:2) argues that the absence of a conceptual base is perhaps best exemplified in the variety of terms that are used. While there appears to be an assumption of a shared understanding of the terms used as well as a place for these "generic" outcomes in university curricula, the lack of specification often leaves the stated outcomes open to interpretation (Barrie, 2006:217). In order to enhance consistency, the term "generic graduate skills" or "generic graduate attributes" will both be used in this paper to refer to the skills that can support study in any discipline. Bennett, Dunne and Carre (1999:72) say the Dearing Report of 1997 makes mention of these skills as "key skills", for the reason that they are "key to the future success of graduates whatever they intend to do later in life". Murphy (2001:3) makes use of the British National Skills Task Force's definition of generic skills as "those transferable skills, essential for employability which is relevant at different levels for most people in the workforce". In addition, Bennett et al. (2000:7) also mention that staff who are expected of to teach these skills, are often unaware of them. Provision of these skills is often conceived in terms of student "learning by doing" or provided by courses that are "bolt-on" (Bennett et al. 2000:7). Bennett's findings showed that where teaching of such skills is claimed, evidence is not available in the planning of the course, teaching methods or assessment documentation.

The South African higher education system has been greatly influenced by global movements including concerns about the nature of the skills required for the knowledge economy, the employability of graduates and greater accountability by higher education systems (De Jager & Nassimbeni, 2005:33). To address this imperative, Badat (2004:8) explains that debates about the changing roles of universities in South Africa in the context of global competitiveness have been accompanied by assertions that curricula and programmes should be developed according to an outcomes-based approach to make the sector more responsive to changing conditions. The National Qualifications Framework (NQF) has paved the way for the creation of a new higher education policy and facilitated the establishment of the South African Qualifications Authority (SAQA). Higher Education systems respond to these pressures by claiming to develop in students sets of "generic skills", or in the South African context, SAQA's "critical cross-field outcomes" (CHE (Council on Higher Education), 2001:107). As the study focuses on the Radiography Programme at the CUT, attention was given firstly to the stakeholders' formulation (?perceptions) of the term "generic graduate skills", and secondly what specific generic skills they regard as essential for radiographers.

Fostering the ability to transfer knowledge from the world of learning, science and scholarship to the world of work is widely viewed as an increasingly

important task of higher education which cannot be met simply by fostering relatively general strategies of problem-solving or relatively general “key” competencies. It calls for a more complex relationship between learning and work in the area of high-level knowledge and cognitively complex tasks. The radiography programme at the CUT has responded to the vast changes in higher education and requirements from SAQA in several ways. The adoption of a learner-centred approach to education by the CUT has learner responsibility and activity as focus points, in contrast to the conventional emphasis on lecturer control and coverage of academic content. One reason for this approach is that it is better aligned with the lifelong learning skills needed in the workforce of the information age. The learner-centred environment facilitates the exploration of meaning and content knowledge through personal and interpersonal discovery, which implies active involvement by the learner and the integration of academic staff with the learner’s total development (CUT, 2004).

The mission of the radiography programme at the CUT was developed in an attempt to equip the radiography students with the necessary generic graduate skills. It consisted of the following programme outcomes:

- To facilitate dedicated and career-focused expertise to quality learners in promoting academic excellence in radiography;
- To provide knowledge and skills, and develop appropriate attitudes in radiography at the forefront of technology in human health;
- To undertake research that addresses regional, national and international issues to equal global standards;
- To address the needs of the community to ensure upliftment through education, research and skills development, so as to improve quality of life; and
- To establish and maintain collaboration with stakeholders in radiography and dental assisting (Radiography and Dental Assisting Strategic Plan 2006 2010).

Linkages between competencies acquired during the course of study and work requirements are, however, not automatically established. According to Teichler & Kehm (1995:123), a closer link between the acquisition of knowledge and skills and their subsequent utilization could be reached through various forms of experiential or work-based learning. The workplace as an important site for lifelong learning is also identified by Blackwell, Bowes, Harvey, Hesketh and Knight (2001:270) as a key to the well-being of a knowledge-based, highly-skilled, flexible economy.

The academic staff of the radiography programme at the CUT accepts that learning also takes place outside formal academic settings and they value work experience as a significant element of student learning. It is for this reason that it is compulsory for students in the radiography programme at the CUT to do experiential learning during their course of study. Students are therefore

employed in radiology practices during their three years of undergraduate study where they gain practical experience in their field of study. Close cooperation is kept between the work place and the CUT by means of advisory committee meetings and interviews with relevant stakeholders to ensure optimum benefits for both parties. However, regardless of all the initiatives and achievements of the radiography programme to encourage the development of generic graduate skills in their students, no evidence is available on the extent of awareness of stakeholders on the generic skills issue. The research done was therefore well-timed to explore the skills, attitudes and abilities which are needed in the workplace of radiographers.

The role of the researcher as manager and participant in a team that exercises influence on programme development therefore makes the inquiry regarding the awareness and identification of generic skills, with specific interest in the radiography programme at the CUT. It is an inquiry necessary to provide a basis on which higher education might respond to stakeholders' requirements and simultaneously helps students towards success at work. The research reported in this article is the result of stakeholders' views explored on generic graduate skills in order to make further suggestions for future programme development and research.

### **3. METHODOLOGY**

The qualitative inquiry employed in this study could be described as "descriptive exploratory" which allows a different view of the theme that is studied and one in which respondents had a more open-ended way of giving their views and demonstrating their actions (Henning et al. 2004: 3). Furthermore, the design could be described as emergent, as the researcher started out with an initial focus, but was redirected once engaging in the ongoing process of data collection (Maykut & Morehouse, 1994:46). As a result of the simultaneous data collection and data analysis, the ongoing activities allowed for understandings to be discovered which were then pursued in additional data collection efforts. The study took place within the field of Higher Education Studies with specific relevance to the radiography programme at the CUT.

#### **Study population**

As the study had a specific interest in the radiography programme at the CUT, purposive sampling was employed with the intension of maximising the potential variation in the selection of the target population (Maykut and Morehouse, 1994:45). Maximum variation was achieved by including radiography students, qualified radiographers, radiography lecturers and employers of radiographers in the sample. The sample consisted of 30 radiography students, representing the three undergraduate year groups in 2006; 12 qualified radiographers in radiology practices in Bloemfontein; two academics at the CUT and two academics from other universities nationally (Cape Peninsula University of

Technology and Tswane University of Technology), responsible for the teaching and learning in radiography programmes; and two radiologists, representing employers in practices where students are doing their experiential learning.

## Data Collection

Data collection for the study involved the use of unstructured focus group discussions, in-depth individual interviews and a selection of reflection reports completed by the radiography students on a weekly basis. A multi-method strategy was therefore used that allowed triangulation, maximising the probability that the emergent assertions were consistent with the variety of data (Maykut & Morehouse, 1994:146). The interviews and focus group discussions varied in format, kinds of questions posed, question sequence and interview logistics. Reflection reports from 16 students' portfolios were also used in combination as a source of data in this research.

Unstructured one-to-one interviews and focus group discussions were used as interviewing methods for information collection during this research. The interviews seemed to be a mix between in-depth interviews and phenomenological interviews. The first noted more for its probes and pauses, whereas the second especially to study meanings among selected participants. Atkins and Ward (2002:1) regard a focus group discussion as a research method designed to explore a particular topic by gathering the experiences and perceptions of selected target populations. By creating a social environment in which group members are stimulated by the perceptions and ideas of each other, one can increase the quality and richness of data through a more efficient strategy than one-on-one interviewing.

A statement of the researcher's purpose and focus was made at the outset of each interview / discussion. Assurances of protection of the person's identity and an overview of the possible discussion topic were also given at this stage. Permission was obtained for digital voice recording, and the manner in which the responses would be recorded, was explained. Although voice recordings were used, this did not eliminate the need for taking notes to help reformulate questions and probes, and to record non-verbal communication, which facilitates data analysis. Data collection lasted until the researcher felt that the data obtained were sufficiently near a point of theoretical saturation.

The following four questions were asked and rephrased to suit the group or individual interviewed:

- What are your perceptions or what do you understand by the term "generic graduate skills or attributes"?
- Can you identify some of the generic graduate skills that you think are necessary for radiography students to have when they graduate?
- Can you identify any needs regarding the teaching, learning, assessment and

- experiential learning of radiography students that needs to be addressed?
- Do you have any suggestions or recommendations to address any of these needs or recommendations to the higher education institution regarding the teaching, learning, assessment and practical experience of radiography students?

The interviews were transcribed by the researcher herself. It provided the opportunity to relive the interviews and become more involved in the process of understanding the meaning the interviewees were trying to convey. In this way the raw data was transferred into clear readable form that could be used for data analysis. The transcriptions and reflection reports were analysed manually by the researcher and ethical consideration was given attention to by means of verbal consent by the stakeholders and an undertaking from the researcher to treat the information received confidentially.

#### **Data Analysis**

In the analysing process of the transcripts of interviews and reflection reports, the different groups were treated as a whole, although coded to identify the group where the statements originated. Identification of the themes or categories involved the sorting of statements made during the interviews and reflection reports on experiencing the research phenomenon. Specific key words regarding the skills were isolated from the interviews, transcriptions of the focus group discussions and reflection reports from the students. The skills identified are presented in a table and importance of each skill indicated by responses from all stakeholders.

#### **4. FINDINGS**

The findings from this study are presented as a set of categories of descriptions representing the different skills identified in the data collected. A number of patterns emerged within the data analysis in relation to the phenomenon researched. Table 1 represents the skills regarded by the Radiography stakeholders as essential generic skills in the radiography profession.

**Table 1 Summary of generic graduate skills identified by Radiography stakeholders\***

Skills identified	Students	Qualified radiographers	Radiography Academics	Employers
Communication	x	x	x	x
Self-management (time-management & self-confidence)	x	x	x	x
Passion to work with people	x			x
Work in a team	x		x	
Handling challenging situations (including conflict)	x	x	x	x
Practical skills of the profession	x		x	
Ethics & Professionalism (respect)	x	x	x	x
Empathy – ability to win confidence of patients	x	x	x	
Take initiative (critical thinking)	x	x	x	x
Open-mindedness (eagerness to learn, lifelong learning)	x	x	x	
Learn to be firm in a professional manner	x			
Recognition of different view points	x	x		
Responsibility (work & own learning)	x	x	x	x
Social responsibility – serving community (upliftment)	x	x		
Accountability	x x			
Computer literacy and management of information	x	x	x	
Administrative competence	x		x	
Coping with heavy workload	x			
Patience x	x			
Honesty x	x			
Adaptation skills		x	x	
Listening skills		x	x	
Good inter-personal relationships		x	x	
Basic language proficiency			x	
Problem solving			x	x

\*X indicates identification of skill by a specific group

According to Table 1, six of the skills were identified by all the radiography stakeholders, namely:

- communication skills,
- self-management skills,
- management of challenging situations (including conflict),
- ethics and professionalism, and
- taking initiative (critical thinking)
- responsibility (work and own learning)

Interestingly, all participants regarded communication as the most important generic graduate skill any health professional/radiographer needs to acquire.

Students and employers regarded the following values and attitudes essential for radiography students to be successful in their work:

- honesty, closely linked to accountability,
- the passion to work with people,
- patience with self and others, and
- the ability to recognise and respect viewpoints of different people.

The need to cope with a heavy workload and the need to learn to be firm in a professional way were the two skills identified only by the radiography students (including first, second and third years). It was the qualified radiographers, who are in a way responsible for student radiographers, who acknowledged the importance for students to adapt to different situations and acquired good listening skills. The skills of life-long learning, computer literacy and problem solving were identified by the students, academics and employers. Students, qualified radiographers and the employers identified the attitude of having empathy with patients. Empathy, according to these participants was an essential skill necessary to be able to work with a diversity of patients, and regarded as a skill especially relevant to the world of a radiographer.

## **5. DISCUSSION**

In this article the generic graduate skills identified by stakeholders in the radiography programme at the CUT are presented (see table 1). Barrie (2006:237) argues that bringing the variation in understandings of graduate attribute outcomes into the open to be debated and discussed is an essential element of the process of agreeing on these attributes. It also serves as a vital precursor to successful curriculum reform to facilitate the attainment of such outcomes. In the light of the above, it has become crucial to gain enhanced understandings of "generic" or "graduate" skills acquisition in higher education and employment in order to inform and improve its provision. The radiography programme promotes this by conducting interviews with employers to identify their needs and promote skills acquisition in students by different methods of facilitation and assessment.

The need for good communication skills was highlighted as the skill most important for a healthcare worker. Teichler (1999:298) also regards communication as a generic skill that cuts across disciplines and forms the basis for various professional skills. Communication skills also represent one of the three skills the Dearing Report (1997) recognised as most important for a graduate to be competent in (Bennet et al. 1999:72). As part of the health care team, radiographers not only must be able to communicate effectively with the patient, but also with the personnel involved in the holistic outcome of the patient. In adherence to the SAQA regulations, the outcome of effective communication is also included in the Teaching and Learning Plan of the CUT (CUT [Teaching and Learning Plan] 2004), and also in the vision and mission of the School of health Technology of which the programme radiography forms part of. Learners in the radiography programme at the CUT are made aware of these generic graduate skills identified by the programme in different ways. One way is to have posters in class with the key attributes radiography students must possess.

Although employers regard communication skills as most important, they place almost equal emphasis on the values inherent in the people they employ. Accountability together with other values such as reliability, empathy for patients, friendliness, respect for all people and willingness to improve on shortcomings are aspects they value in their teams.

As indicated in Table 1, the skills of self-management, management of challenging situations and taking initiative were also perceived by all the participants as essential to students in the radiography programme. Although the students responded to self-management more in the sense of managing their time in terms of time spent on studies, the other three stakeholders regarded self-management more in terms of becoming emotional intelligent. One of the focus points of a learner-centred approach to education, as adopted by the CUT, could facilitate learner responsibility which is in contrast with the traditional educational system with its emphasis on lecturer control. The learner-centered environment aims to facilitate the exploration of meaning and content knowledge through personal and interpersonal discovery, hence the importance of managing one self (CUT, 2004). Bennett et al. (1999:78), from analysis of a previous study have developed a framework of generic graduate skills where management of self with respect to learning, work and personal contexts (including time management) are included.

The skill or value of empathy received attention from students, qualified radiographers and employers. According to the Code of ethics of radiographer (Ballinger and Frank, 1999:2), it can be deducted that empathy is incorporated in phrases such as: respond to patient needs and full respect for the dignity of mankind. It is therefore recommended that empathy could be accepted as a skill regarded as essential for radiography students studying at the CUT. As radiographers have to abide to a specified code of conduct and always need to be professional, the skills of ethics and professionalism can also be reckoned as

receiving high priority by radiographers. The code of conduct is one of the first guiding principles radiography students are exposed to when entering the programme at the CUT. Although "taking initiative" was mentioned by stakeholders in the context of dealing with challenging situations, "taking initiative" as a generic skill from literature refers to graduates that can take the initiative to help develop and transform organisations in response to change (Bennett et al. 2000:5).

It was interesting to note that the list of skills identified in the study includes outcomes that range from simple technical skills to complex intellectual abilities and ethical values. A simple skill such as "listening" was regarded by the students and qualified radiographers as utmost important as the assessment of the patient and the support necessary are dependent on this skill. The code of conduct makes it clear that radiographers act as agents through communication to obtain pertinent information that can aid in the diagnosis and treatment management of the patient (Ballinger and Frank, 1999:2). The researcher is of the opinion that teamwork is only mentioned by students and academics because a great deal of their academic studies consists of assignments where they need to work together and be assessed as a group. It was surprisingly not mentioned by the qualified radiographers and employer representatives, regardless of the fact that radiography is a profession that mostly depends on professionals working together in a health care team.

Harvey (2000:8) mentions that Information Communication Technology (ICT) skills, teamwork, flexibility, adaptability, creative problem solving and risk taking as generic attributes for graduates have been added as a result of technological and organisational changes over 25 years. At the same time, less emphasis is placed on knowledge and more on willingness to continue learning. Essential work environment skills identified in this study include computer literacy, coping with challenging situations, competence in the practical skills of the profession and to be able to solve problems fast and efficiently. It was probably for this reason that feedback from first year students, still new to the work environment, identified that they need more experience in "coping with a heavy workload" and "being firm in a professional way", to become competent. Some of these characteristics have also been observed in other studies. Harvey (2000:1) suggests the incorporation of work experience in which students work closely with employers to address a "real life" concern. Competence in this regard is of utmost importance in the medical profession of which radiographers form part. Both the academics felt that there was a need for radiography students to become competent in basic language proficiency. The fact could be ascribed to student diversity of backgrounds with different standards of basic language proficiency, and to the fact that students have to communicate to a diversity of patients in the work environment. All first year student at the CUT are subjected to an English Proficiency Test (EPT). Students who don't pass the test are required to attend additional classes in English during their first year.

It might thus be said that although the focus regarding specific skills identified varies slightly between students, qualified radiographers, radiography academics and employers, there is a definite correspondence between the perceptions of the skills regarded as essential for radiography graduates, such as communication, self-management, taking initiative and the unique skill of empathy. The different stakeholders in the programme are responsible for different functions in the radiography profession and it is for this reason that the researcher can accept the slight variation in the focus of the different skills.

## **6. RECOMMENDATIONS**

Findings from this study provide a clear indication that the radiography programme at the CUT needs to be more aware of the demands in the world of work. The need to include all stakeholders in programme planning and participating in program evaluation has become essential in a rapidly changing society where employers want employees who are quick to learn, deal with change and use their abilities and skills to evolve organisations.

## **7. CONCLUSION**

The identification of generic graduate skills for students in South African Universities and more specifically students in the radiography programme at the CUT was necessary and well timed, given the demands for universities to define and give evidence of the quality of the education and graduates they produce. Radiography stakeholders involved in academic and work-based learning at the CUT identified communication, self-management, handling of challenging situations, ethics, professionalism and critical thinking as necessary to prepare students for the world of work. The findings of this study therefore offer a basis for productive discussions between stakeholders about ongoing programme development to address the possible lack in the attainment and assessment of the above-mentioned skills. The study can therefore be seen as a set off point in the process of benchmarking these programme-specific skills, in an effort to ensure quality and make sure it is on par with international standards. The evidence acquired from these research results already provides the generic skills for benchmarking that address the cooperation between the academe and industry, thus a call for better communication, cooperation and collaboration in this regard.

It must therefore be the radiography programme's aim to stay in touch with the rapidly changing trends in society and industry, in an effort to be flexible and responsive in its structure to accommodate such changes. The study further contributes to and recommends further research on methods to address and assess the generic graduate skills as it would certainly contribute to the viability of the programme and the quality of its graduates.

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