

# **AN INVESTIGATION TOWARDS THE NEED FOR A POSTGRADUATE QUALIFICATION IN THE SPECIALISATION FIELDS OF DIAGNOSTIC RADIOGRAPHY AT THE CUT**

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## **ABSTRACT**

The current master's degree qualification in Diagnostic Radiography at the Central University of Technology, Free State (CUT) is research based and does seemingly not address the need for training in the specialisation fields of Diagnostic Radiography sufficiently. To address this problem, a needs assessment was conducted amongst qualified diagnostic radiographers in Bloemfontein and Kimberley by means of quantitative questionnaires, qualitative interviews and a focus group discussion. The main aim of the needs assessment was to determine the need for a postgraduate qualification for radiographers in the specialised fields. The possible structure of such a program and the preferred mode of delivery were also investigated. The results of the study emphasised the need for a structured postgraduate learning programme in the specialisation fields in Diagnostic Radiography in the region. Responding to this validated need for a structured postgraduate qualification at the CUT, the current master's degree was revised to accommodate the results of the study and it was proposed to the Professional Board for Radiography and Clinical Technology for approval.

**Keywords:** Specialisation fields, Postgraduate qualification, Role extension, Educational preferences

## **1. INTRODUCTION**

The Radiography discipline acts as an umbrella to four sub-disciplines or categories namely: Diagnostic Radiography (D), Radiation Therapy (RT), Nuclear Medicine (NM) and Ultrasonography (US). Each of the four categories has various specialisation fields. For example, the specialisation fields in Diagnostic Radiography include: Magnetic Resonance Imaging (MR), Computerised Tomography (CT), Vascular Interventional Angiography and Mammography.

The Central University of Technology, Free State (CUT) currently presents an under-graduate three year diploma qualification in Diagnostic Radiography. In the third year of study, specific learning units in the module Radiographic Practice III concentrate solely on the fundamental principles of the specialisation fields with the emphasis on attaining knowledge outcomes and not practical skills and capabilities. After completion of the under-graduate diploma students can decide whether they want to continue their studies in one of the four categories in Radiography such as Diagnostic Radiography or Radiation Therapy. Although

students can proceed up to the master's degree level in any of the mentioned categories in Radiography, an accredited formal qualification in the specialisation fields in Diagnostic Radiography does not currently exist at the CUT.

Work in the four specialisation fields demand high level knowledge and skills since radiographers have to operate state-of-the-art, computerised imaging technology and interpret complex anatomical structures. In the absence of a formal qualification radiographers working in the specialisation fields are currently fulfilling many roles such as the operation of specialised equipment, image interpretation and decision making regarding applicable imaging protocols to demonstrate certain pathological conditions. Most of these radiographers only received "hands-on" training in the practices where they are employed. The duration of this hands-on training is usually approximately 5 - 8 weeks depending on the level of expertise that are required (Fox, 2007). Therefore these radiographers often lack the necessary in-depth knowledge (theoretical knowledge) of the related systems to ensure successful application of all available options when using specialised diagnostic equipment.

During the past two decades imaging in Diagnostic Radiography experienced an explosion in computer technology. Due to the innovations in radiography technology, the expansion of knowledge and the development in the specialisation fields of Diagnostic Radiography, curricula in professional radiography career education are constantly subject to change. Radiographers who have been qualified for many years were not exposed to the content of the latest syllabi and developments in technology. If radiographers do not regularly update and expand their knowledge and skills, it will lead to stagnation and regression. This may even cause the credibility of the profession to be questioned (Williams, 2006:14).

The emphasis on the broadening of the scope of the diagnostic radiographer throughout the last decade further emphasised the need to investigate a possible post graduate learning programme at the CUT. Throughout the last decade the scope and practice of Radiography continued to increase and broaden. During this period diagnostic radiographers established a role in image interpretation and have taken responsibility for a range of clinical activities in examinations performed with specialised imaging modalities. According to Thulo (2005:27), technological change, improvement and the introduction of modern imaging equipment and modalities have an effect on the radiographer's competence in performing his or her task. Radiographers are therefore challenged more and more to adapt to their role as presented in different environments.

## **2. PURPOSE OF THE STUDY**

The main aim of the study was to perform a survey amongst qualified diagnostic radiographers in the Free State and Northern Cape region to assess the need for

a post-graduate learning programme in Diagnostic Radiography at the CUT. Other important aspects included in the investigation were to identify the structure, preferred modules and delivery mode which should be included in a postgraduate learning programme.

### **3. METHODOLOGY**

A descriptive survey in the form of a needs assessment forms an integral part of the methodology for the study. Babbie and Mouton (2001:231), advocate survey research to be so popular since it is primarily used in studies that have individual people as the units of analysis. Likewise, they are also excellent for measuring attitudes and orientations in a larger population. In survey research the investigator selects a sample of subjects and administers a questionnaire or conducts interviews to collect data to describe the attitudes, beliefs and opinions of people (McMillan & Schumacher, 2001:33). The summaries were used to describe the demographic data of the respondents, the profile of the organisations in which the respondents were employed, the position of the respondents in the organisations, the educational and professional background of the respondents, and respondents' perceived needs for further education in the specialisation fields of Diagnostic Radiography.

For the collection of data the principle of triangulation was utilized by accumulating data by means of an in-depth literature study, quantitative questionnaires, qualitative interviews and a focus group discussion. According to Creswell (1994:174), the concept of triangulation is based on the assumption that any bias inherent in a particular data source, investigator and method would be neutralized when used in conjunction with other data sources. The main aim of the interview questions was to support or clarify replies from the respondents in the questionnaires. Thus, by conducting the interviews the researcher aimed to ensure and further the validity and reliability of the results from the questionnaire. An interview guide was compiled for the personal interviews (radiographers and employers) and the focus group discussion after analysis of the questionnaire results.

The study was limited to diagnostic radiographers currently employed in Bloemfontein and Kimberley, including both public and private sector radiographers. This includes radiographers from the following public sector hospitals: Universitas, National and Pelonomi hospitals in Bloemfontein and the Academic Hospital Complex in Kimberley, and radiographers from the private practices of Dr Van Dyk and Partners and Dr Spies and Partners in Bloemfontein, and Drs Von Bezing, Graham and Brand in Kimberley. Assistant radiographers (supplementary radiographers) were excluded from the study since their qualification level was unsuitable to access a postgraduate qualification. Qualified diagnostic radiographers currently doing their compulsory community service were included in the study. The names and contact numbers of 129 radiographers were obtained. After the elimination of the assistant

## 4. RESULTS AND DISCUSSION

### 4.1 Response rate for questionnaire survey

The response rate for the questionnaire survey was 53.4%. A higher response rate was anticipated since the questionnaires were hand-delivered and collected, thus eliminating the effort for the respondents to return the questionnaire by mail. The achieved response rate was, however, still deemed adequate although Armstrong and Ashworth (2000:479) advise response rates of 60% or more as a necessity to ensure reliability of the results.

Table 4.1 Response rate for the questionnaire survey

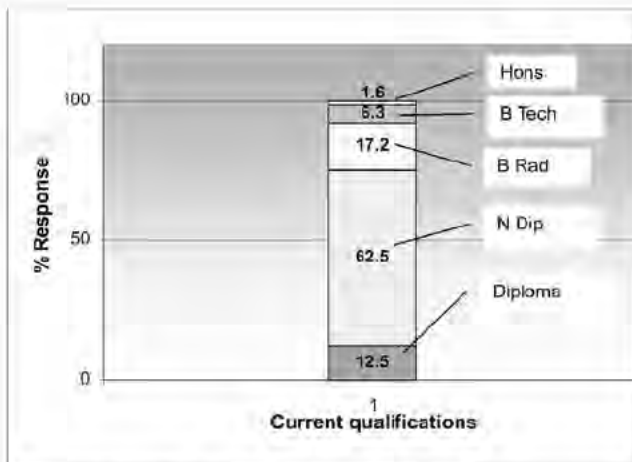
Institutions	Number sent out	% Potential contribution	Response	% Response
MediClinic Kimberley	10	8%	4	40%
Kimberley Academic Hospital Complex	19	16%	14	79%
MediClinic Bloemfontein	28	23%	7	25%
Rose Park hospital	16	13%	11	38%
Universitas hospital	25	20%	13	53%
Pelonomi hospital	22	18%	14	64%
	120	100%	64	53.4%

### 4.2 Educational background of participants

The majority of the respondents (62.5%) were in possession of a three-year National Diploma in Diagnostic Radiography (Figure 4.1). The highest level of educational achievement among the respondents was an honours or B.Tech degree in Diagnostic Radiography (1.6% + 6.3% = 7.9%). Only 6 (9.4%) of the respondents indicated that they were involved in further studies (Table 4.2). All radiographers who indicated that they were engaged in further studies (9.4%) are currently enrolled for a B.Tech degree in Diagnostic Radiography (Table 4.2). From these results it is evident that there is a reasonable amount of reluctance among the participating radiographers to enroll for further study. This reluctance was confirmed by the results from the interviews and focus group. Only two of the ten radiographers who participated in the interviews were currently enrolled for further study and none of the four chief radiographers participating in the focus group was enrolled for further study. The participants in the interviews identified limited promotion opportunities and the lack of acknowledgement through better remuneration as the main impacting factors for reluctance among radiographers to enroll for further studies.

**Table 4.2 Current engagement in further studies**

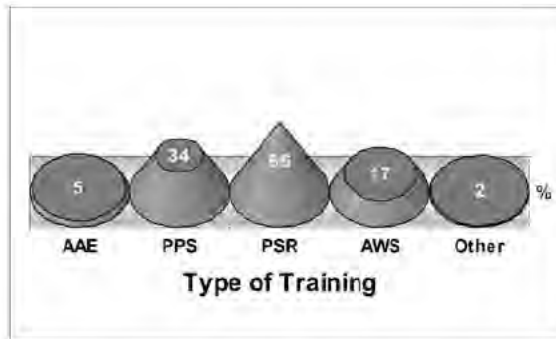
	Response	% Response
Engaged	6	9.4
Not engaged	58	90.6



**Figure 4.1 Current qualifications of the respondents**

### **4.3 Type of training received in the specialisation fields**

The results depicted in Figure 4.2 confirm that only 5% of the respondents had received additional academic education (AAE) in one or more of the specialisation fields. Unfortunately the questionnaire did not make provision for gathering more information regarding the type of academic education or the institution where the qualification was achieved. This might be considered a limitation in the questionnaire. Professional training by a product specialist (PPS) or by a senior radiographer (PSR) heads the list of types of training received as the results show that a very high proportion of the respondents received either one or both of these two types of training (Figure 4.2). In the questionnaire survey 17% of the respondents indicated that they had attended some workshops or seminars to upgrade their knowledge and skills for working in the specialisation fields (Figure 4.2). Only 2% indicated that they had received other training in the specialisation fields, but unfortunately did not specify the type of training.

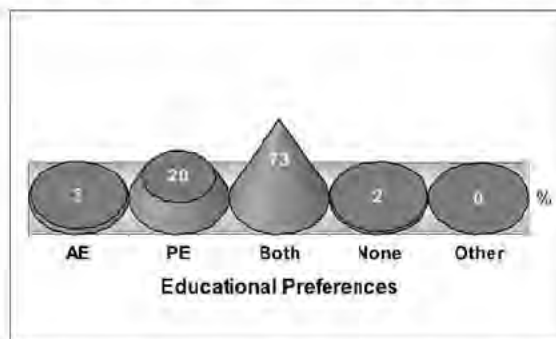


- \*AAE = Additional academic education
- \*PPS = Professional training by a product specialist
- \*PSR = Professional training by a senior radiographer
- \*AWS = Attendance of workshops and seminars

Figure 4.2 Type of training received in the specialisation fields

#### 4.4 Educational preferences of the target population

As can be seen from Figure 4.3, 73% of the respondents preferred both academic education (AE) and professional education (PE) in the specialisation fields of Diagnostic Radiography. Three percent of the respondents indicated that they prefer academic education only and 2% indicated that they prefer no education. During the personal interviews the respondents indicated that the most probable reason for the preference of both AE and PE was the fact that Radiography is a profession with a strong work-integrated learning (WIL) component. Without the necessary skills to perform an examination all the factual knowledge (attained via AE) will be worthless and the only worthwhile way to learn a skill is to apply acquired knowledge in practice (attained by PE).

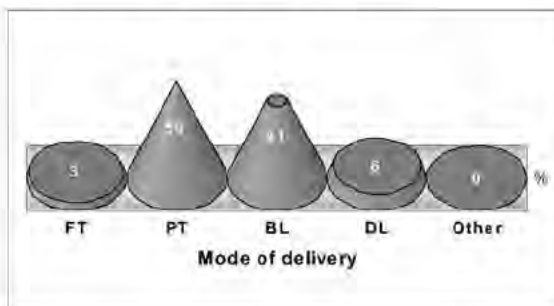


- \*AE = Academic Education    \*PE = Professional Education

Figure 4.3 Educational preferences in the specialisation fields

#### 4.5 Preferred mode of delivery

Figure 4.4 indicated that the bulk of the respondents (91%) opted for either part time study (50%) or a blended learning model (41%). Only 3% of the respondents opted for full time study and 6% for a distance learning model. To clarify the educational concepts to the radiographers in clinical practice, the terms "part time study", "blended learning" and "distance learning" were explained. All participants in the interviews and focus group discussion opted for a blended learning model after a brief explanation of the different models. The reason for their choice seems to be that all of them are potential adult learners permanently employed as diagnostic radiographers.

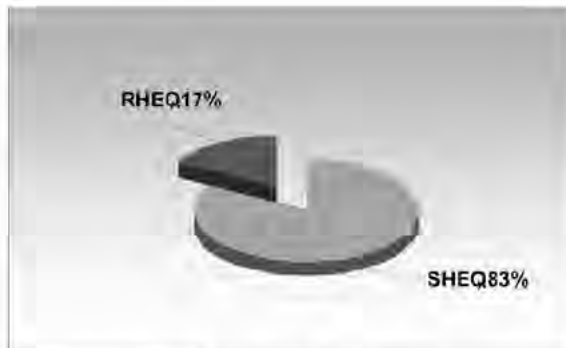


- \*FT = Full time study \*PT = Part time study \*BL = Blended learning
- \*DL = Distance learning

Figure 4.4 Preferred mode of delivery

#### 4.6 Preferred structure of a future postgraduate programme

As can be seen from the pie graph (Fig. 4.5), 83% of the respondents preferred a higher education qualification structured into different modules. Only 17% of the respondents opted for a pure research-based qualification. Personal interviews with the ten selected radiographers confirms a choice of modules (electives), for example a year module respectively for two of the four specialisation fields (MRI, CT, Vascular Angiography and Mammography). They agreed that the research dissertation should be compulsory.



- \*RHEQ = Research Higher Education Qualification
- \*SHEQ = Structured Higher Education Qualification

Figure 4.5 Preferred structure of a future higher education programme

## 5. CONCLUSION AND RECOMMENDATIONS

Results from the quantitative survey, as well as comments from the qualitative part of the survey, were generally in favour of postgraduate training in the specialisation fields of Diagnostic Radiography. The possibility of attaining a postgraduate qualification was deemed by the majority of respondents as necessary for progress in their own careers as well as for the status of the profession as a whole. Furthermore, most prospective learners were of the opinion that the study material and mode of delivery, if chosen with careful consideration, could be beneficial to their knowledge base and could help with the time constraint that normally impedes academic studying in the Radiography profession. From the results of the study it is possible to make the following recommendations for planning and provision of future higher education programmes in Diagnostic Radiography at the CUT, namely that; .

- Both academic and professional training should form part of a future higher education programme as indicated by 73% of the participants. Thus, such a programme should be structured with a formal academic component and a component to monitor the achievement of skills and capabilities in clinical practice. A portfolio of evidence might be feasible.
- A future higher education programme should be structured with regular contact sessions (maybe one per quarter) after which the student should work independently on assigned projects and the development of skills and competencies. All learning material should be available online and electronic learning and assessment should be actively utilised. Ninety one percent of the participants opted for either part time study or a blended learning model if they were to engage in further study.

- As 83% of the respondents chose a structured qualification, the proposed programme could thus comprise of the successful completion of a course work programme (modules), requiring a high level of theoretical engagement and intellectual independence, and a research project, culminating in the acceptance of a dissertation. In the latter case, a minimum of 60 credits (of the 180 credits) at level 9 of the new Higher Education Qualifications Framework (HEQF) must be devoted to conducting and reporting research (HEQF, 2006). The number of electives can be offered at the discretion of the provider depending on the number of credits allocated to each elective.

Responding to this need, the current research-based master's degree qualification was adjusted to accommodate the results of the study. The adapted qualification was subsequently proposed to the Professional Board for Radiography and Clinical Technology in March 2007. At the time of submission of this research study approval of the qualification was still pending.

## **6. BIBLIOGRAPHY**

Armstrong, D. & Ashworth, M. 2000. When questionnaire response rates do matter: a survey of general practitioners and their views of NHS changes. *British Journal of General Practice*. 50: 479-480.

Babbie, E. & Mouton, J. 2001. The practice of social research. Cape Town: Oxford University Press. 231.

Creswell, J.W. 1994. Research design: qualitative and quantitative approaches. Thousand Oaks: Sage. 174.

Fox, J. Personal interview. Bloemfontein: Department Diagnostic Radiology Universitas hospital.

HPCSA (Health Professions Council of South Africa). 2006. Continuing Professional Development: Guidelines for the health care professionals. 3, 8.

McMillan, J.H. & Schumacher, S. 2001. Research in Education: A Conceptual Introduction. New York: Longman. 31, 33.

Thulo, A.M. 2005. The Role of Leadership in Creating Excellence in Diagnostic Radiography-Program through Curriculum Restructuring. (Unpublished Master's Thesis). Pretoria: University of Pretoria. 27.

Williams, I. 2006. Professional role extension for radiographers. *The South African Radiographer*. 44(2):14-17