

Guest Editorial

Professional expertise for radiation therapists in Africa

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Abstract

The radiation therapist (RTT) is a practitioner who must learn to take responsibility as an autonomous professional within a collaborative multi-professional team. A case study of international students on fellowship studies to a South African Higher Education Institution was used as the lens to explore the development of professional expertise in RTTs. Documents and semi-structured interviews generated textual data that was semantically analysed. The findings are presented as a discussion of the themes that emerged from the text data; (1) autonomy in a team, (2) collaboration facilitates learning, (3) the need for professional competence, (4) reflective practice and (5) participatory learning. The paper offers the interpretation of professional competence as a practitioner who has applicable knowledge, clinical and generic competence as well as appropriate behaviour and attitudes. It is proposed that a collaborative, integrated curriculum meets the need for the education of RTTs on the African continent. In such an environment optimised learning is facilitated by access to good clinical role models, the development of skills toward reflective practice and student participation in the learning environment.

INTRODUCTION

The development of professional expertise in a highly specialized group, the Radiation Therapist (RTT), was the focus of this study. A professional expert is considered as a practitioner, who is clinically competent, has a professional attitude and conduct, and who is able to integrate generic skills into their professional practice. RTTs are health care practitioners who practice in radiation oncology and have a primary responsibility for the preparation and delivery of radiation therapy to persons diagnosed with cancer. They must be equipped to work on advanced technology equipment, that demands careful operation, in order to deliver accurate treatment to malignant disease with due consideration for the potential risks from ionising radiation, and with care and empathy for the patient undergoing treatment. The findings presented here are those identified

as most relevant to the professional development of a sub-set of RTTs; those on an international fellowship from countries in Africa. The small number of RTTs required makes the implementation of a higher education programme improbable in most countries in Africa. Yet the need to improve the care and treatment of cancer patients on this continent will not be satisfied without attention to the development of professional expertise of the practitioners doing the daily treatments.

Collaborative partnerships were developed in order to meet this education and training need. The partnership involves (1) the International Atomic Energy Agency (IAEA), an international agency committed to improving radiation oncology services in the developing world, (2) a higher education institution in South Africa motivated to contributing to the professional education of RTTs for Africa, (3) radiation oncology departments, at health care institutions in South Africa, who agreed to participate by offering

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work integrated learning opportunities to practitioners from other African countries, (4) radiation oncology departments, at health care institutions in African countries, who identify practitioners for training and who initiate training and work experience locally and (5) the RTTs who embark on a programme of professional development.

A brief overview of the status of radiation oncology in developing countries will be presented in order to locate the study. Thereafter, the methodology and findings of the case study will be described. As a closing the conclusions are presented to draw out the main learning and to recommend the way forward for the education of RTTs in Africa.

RADIATION ONCOLOGY IN DEVELOPING COUNTRIES

The provision of equipment for radiation oncology and the education of health care practitioners for the development of this specialty in the developing world has had focused attention and high volume external funding. However the service remains far short of the ideal standards due to the economic constraints in developing countries,¹ that limit equipment acquisition and maintenance as well as practitioner education and training. The standard in Europe is one external beam radiotherapy machine for every 250,000 people. In Africa 25 countries have no radiation oncology service at all² and in most where there is a service it is grossly inadequate. For example one country, with a population of 70 million, has only one operational external beam radiotherapy machine and in Anglophone West Africa an equally dire situation exists. In this region there has been little change since 1990 when there were only two radiation oncology centres with one machine in each for a population of 140 million.³ The situation for the entire African continent is that there are only about 100 radiotherapy machines in operation⁴ and most of these are located in two countries.

Over the next 20 years nearly 100 million cancer patients in developing countries will require radiotherapy treatment and with the resources available at present less than one-quarter of these

will have access to cancer treatment. While equipment is a major factor the more critical problem is that even the equipment available is under-utilized because of an inadequate number of trained staff to operate them.² This makes the development of professional expertise through the education of RTTs an essential component of the solution to the crisis of inadequate care and treatment for cancer sufferers in Africa.

METHODOLOGY

The focus of this study was the fellowship training for RTTs to promote professional expertise. The integrated curriculum implemented to educate the fellowship students, is an example of a local response to (1) global technological advancement, (2) the new professional identities and practices of RTTs, and (3) the influence of the environment on the delivery of health care and health science education in Africa.⁵ Between the years 2000 and 2006, 30 RTTs entered a fellowship programme at one institution. The target group for this study was the 21 qualified diagnostic radiographers who followed a 15-month curriculum to meet the objectives specified in the IAEA syllabus for RTT Education and Training.⁶ Since opinions and perceptions on the effectiveness of this curriculum were explored to meet the educational outcomes, a qualitative research method was appropriate. Furthermore the case study, as an empirical inquiry, is suited to practice-oriented fields such as education and health sciences. This was therefore the selected research method for this investigation of a contemporary event in a real-world setting, where the researcher was an active participant and where the boundaries between the phenomenon, professional expertise and the context could not easily be identified.⁷ This research, located in the qualitative paradigm, used observational methodology and purposively selected accompanying data. The one-on-one interview, as a means to gain the perspective of nine participating RTT fellows, three academics and nine practitioners, was the main data gathering method in this study. A semi-structured interview with prearranged questions, but where the interviewer has the freedom to ask additional questions when indicated,⁸ was used. Through the questions the participants

(IAEA fellows and other members of the multi-disciplinary oncology team in radiation oncology departments) were asked for their opinion of the professional elements needed in an RTT curriculum for Africa and whether or not this integrated curriculum adequately met the needs of preparing the RTT for the workplace. As a form of triangulation the IAEA recommended syllabus for RTTs,⁶ was subjected to document analysis to identify terms indicating a notion of professionalism and expertise. All textual data gathered was submitted to semantic analysis in order to enhance the understanding of the place of a collaborative integrated learning curriculum for professional development.

FINDINGS

The results of this case study are presented in the form of themes that are important for considering the RTT as a professional expert. An integrated discussion of these themes, including relevant literature is presented as the findings of this study.

Theme 1: autonomy in a team

The need for RTT responsibility and autonomy was recognized but always with participants stressing that radiation oncology requires a multidisciplinary team of health care practitioners in which the key members are the RTT, medical physicist, oncology nurse, and radiation oncologist (specialist physician). All these groups display features of a profession that include, an identifiable knowledge base and specific competencies to permit the offering of a specialized service. Cognitive, psychomotor and affective learning⁹ are acquired through intellectual and clinico-practical engagement within a context of autonomy, direct interaction with clients, license to practice, responsibility and integrity, while serving society.¹⁰

In an extensive exploratory study, involving a systematic literature search and qualitative analysis, the authors,¹¹ identified three themes within the concept of professionalism. These are (1) interpersonal professionalism with the elements of effective contact with the patient and the health care team, (2) public professionalism

that covers those elements of professionalism that relate to the demands society places on the health care professions and (3) interpersonal professionalism that covers the individual characteristics or behaviours needed to function as a professional. This was found to be a helpful framework for the conceptualisation of the RTT as a professional.

Accepting professionalism as an important learning outcome in health care practitioner education,¹² this framework was used to develop an inventory of the elements of professionalism for the RTT. There is evidence of elements covering the three themes of professionalism in the IAEA syllabus,⁶ and the interview data supported the overt inclusion of professionalism in the curriculum.

Interpersonal professionalism

Professional appearance and professional competence was emphasised as giving an 'RTT identity' (RTT4)^a within the multidisciplinary team. Effective contact with the patient was evident in the syllabus in items such as general care of patient, ensuring patient privacy, communication skills (verbal, non-verbal, information giving). Interviewees consistently stressed the importance of 'patient centred' (RTT1, A2, P7) and 'holistic' (RTT3, 4, 7) care. In further expanding on this, participants included accurate treatment (professional expertise) as a key element of patient care. Ethics and cultural sensitivity were also identified elements in patient communication and care.

Public professionalism

The demands placed on the RTT from society are evident in the IAEA syllabus,⁶ in the items; legal aspects, confidentiality, informed consent, data protection, health and safety, radiation safety and technical competence. Interestingly, the participants located RTT professionalism at the micro level of the individual patient and only with additional questioning did they expand this to include a contribution to society. At all instances when society was mentioned the importance of the multidisciplinary team was stressed.

^aDirect quotes of participant responses will be indicated as RTT (Radiation Therapist, P (Practitioner) and A (Academic) with a number to denote the participant identification allocated in the study.

Intrapersonal professionalism

The IAEA syllabus,⁶ does not refer directly to RTT characteristics or behaviours; however, it is underpinned by values and attitudes in the need for qualities such as caring, honesty, good communication skills and accuracy. In contrast all interviewees stressed aspects that can be classified, as intrapersonal professionalism, as indicators of successful education of an RTT.

Since professional behaviour and the conceptualisation of professionalism is context dependent,^{11,13} the universal elements of professionalism must be embedded within any programme while the specific aspects of the local environment must accommodate the contextual variations due to culture, disease prevalence and other such influencing factors.

Theme 2: collaboration facilitates learning

A curriculum structure to develop professional expertise and professionalism had to be determined to meet the specific needs. At the site of this case study, a higher education institution in South Africa, an integrated curriculum was implemented for the education of RTTs on funded fellowships of the IAEA. The RTT fellows came from ten countries in Africa where there is an operational Radiation Oncology facility but no formal education programme for RTTs at the time of the study. A collaborative partnership supported and enhanced the integrated curriculum as a way to achieve RTT education in Africa.

The literature does not indicate a precise definition or description of an integrated curriculum in professional education but rather a continuum of education strategies for integration.^{14,15} This means that a variety of teaching and learning practices are referred to as integrated, but that in general terms integration in professional education can be described as a curriculum in which academics seek maximum student participation in a learning environment that integrates the knowledge, clinical competencies and generic skills through the use of problems, themes, topics, outcomes or other connectors.

An integrated curriculum will tend toward more innovative activities of teaching, learning and assessment such that the curriculum will encourage self-directed learning, openness, flexibility and depth as well as breadth in a student-centred environment. An integrated curriculum can therefore integrate the vertical disciplinary and horizontal practice knowledge¹⁶ of professional education.

While it remains difficult to precisely define a professional, the explicit RTT syllabus was used at a higher education institution in the Western Cape, South Africa to guide development through clear learning outcomes. These were the basis for the implementation of an integrated curriculum that ensures coverage of the required knowledge, competencies and generic skills and that facilitates professional development of RTTs during a fellowship of 12–15 months, dependent on previous workplace experience in Radiation Oncology. This short fellowship allowed for a cognitive foundation through the learning of radiation oncology principles and the acquisition of core competencies for practice as an RTT. In agreement with the findings of Yelder,¹⁷ the interview data revealed that professionalism in RTTs includes radiation oncology knowledge, cognitive ability, clinical practice and interpersonal relationships. The opinion of the fellowship was that the outcome of ‘*technical competence*’ (RTT4, P3) or more commonly expressed ‘*clinical competence*’ (RTT1, 2, 5, 7, 9 & P2, 4, 5) was achieved to some level. However the indication is that the fellowship did not reach the goal of developing the RTT as a ‘*true expert*’ (RTT3, 4, 9 & P1, 2, 3). To give an example one respondent who was asked whether the RTT returning from a 15-month fellowship could be considered as a qualified professional, answered as follows:

Here you mean a professional who can do everything that is needed of an RTT. I mean after only 15-months they are not an expert. They can do the most important thing (machine set-up) well but other things that they should know they cannot do. They are not fully expert. That comes with more experience... (RO2)

Following the fellowship, the Radiation Oncology Department at the health care institution in the home country, offered further work experience. This experience developed the ability of the RTT to integrate all the dimensions of professional expertise¹⁷ and enhance the benefit of the international fellowship. Each RTT needed to make a conscious choice to continue their professional development when they returned to their department of origin. To achieve this, the RTT respondents indicated the need for a positive attitude, determination, generic skills and a supportive environment.

As found by McLean,¹⁸ clinical role models are important with early exposure to professional practice. The presence of clinical role models in the department of origin appears to be of particular importance and particularly challenging in a situation, where the first RTT returns to a department as the only qualified RTT. The role model was therefore not necessarily another RTT and in some instances was a Medical Physicist or Radiation Oncologist. What was stressed as essential is that this role model guided the RTT to prepare appropriately for the fellowship and contributed to continual learning after they returned home from the fellowship. Those RTTs who were fortunate enough to identify effective clinical role models indicated that this was a major factor in their development as professionals.

Theme 3: the need for professional competence

In the IAEA syllabus,⁶ there is extensive attention to the professional competencies, generic skills and knowledge required by the RTT. Further to this, the recommended assessment of generic skills and applied professional knowledge, as clinical competence, indicates explicit detail of what is necessary to be adequate as a professional in this field of health care. In this case study, the student and practitioner participants focused heavily on the acquisition of professional knowledge and competence. Their opinion supported the notion that the key to developing an RTT practitioner is a curriculum that involves a process *'like becoming*

a professional' (RTT6). Academics, on the other hand held a broader view of what it means to develop as a professional. While they too considered professional knowledge and competence as important they also valued the integration of generic skills. I favour the term *'generic competencies'* (A1) rather than the term *'generic skills'*. This because it aptly emphasises that the skills must be competently applied within the professional context. The generic competencies identified as important by the participants are the ability to gather information, use a computer, communicate in a variety of contexts in appropriate written and verbal language, operate autonomously and practice self-regulation. Academic stressed values and behaviour as important in professionalism as well as characteristics such as *'honesty'* (A2), *'non-judgmental approach'* (A1), *'empathy'* (A1, 2, 3), *'being able to ask for help were indicated'* (A3) and *'maintaining currency of professional competence through continuing professional development'* (A1, 2, 3).

Theme 4: reflective practice

The impression is that the integrated curriculum prepared the RTTs for reflective practice. In this reflective model the traditional or disciplinary theory must still be learnt; however, the emphasis is on useful knowledge acquired through a process of personal professional practice as a thoughtful practitioner.¹⁹ This therefore, redirected the traditional use of theory or public knowledge as a means to improve practice. Practice is defended as the means toward the development and refinement of personally relevant theory such that information is internalised and transformed into knowledge. The reflective RTT should be able to return to their country of origin and develop new and better methods of practice by practicing in the context, examining the practice and making appropriate changes to their practice. There is early evidence that this model of practice will promote quality care and treatment of cancer patients in Africa. However this evidence of a positive outcome needs further research to demonstrate whether the collaborative integrated curriculum does in fact enhance the ability to use acquired theory and competencies in order for the RTT to continue developing as they increase

Passive Conservative Moderate Considerable Active

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Student Participation

Figure 1. Continuum of student participation in the learning activities of an integrated curriculum.

their professional knowledge and improve their practice.

Theme 5: participatory learning

The study high-lighted student participation as the key aspect in student centred learning. A continuum of student participation (Figure 1) exists and the learning environment of the integrated curriculum included the majority of learning activities in the moderate, considerable or active range of participation. Only very few activities were designed in the conservative participation range and no activities were rated as environments where students were passive recipients. The student perspective on the curriculum was that student participation in the learning experience had a positive impact on their professional development. This is supported by a study showing that a curriculum that integrates basic and clinical sciences is a positive learning experience because of the high level of student participation.²⁰

The RTT fellows had to adjust to a learning environment in which they were expected to actively participate. Although this was not always easy, given the additional challenges of language difficulties and cultural differences, they all developed as participatory group members and expressed positive opinions on *'having to do things myself'* (RTT2). The impact of participatory learning needs further studies to confirm the impression of it contributing to the professional development of RTTs.

CONCLUSION

It is proposed that a curriculum that integrates knowledge, professional and generic competencies, in a participatory environment, promotes the rapid development of professionalism. This demands a concerted effort and contribution from the key role players in curriculum; the students, the higher education practitioners and

the professional practitioners, as each move out of their comfort zone of a teaching focus to a learning focus. While it is apparent that RTTs benefit from the fellowship training, the best model is still to be determined. The full advantages and disadvantages of this curriculum structure for RTT education and training in Africa needs further study to determine what information and skills should be gained locally prior to the fellowship and what support is needed following the fellowship. In addition the impact of a fellowship using an integrated curriculum must be tracked to evaluate whether professionalism is enhanced in the long term for these specialized practitioners and whether the service to cancer patients in Africa is improved through the provision of well-qualified RTTs.

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