An analysis of the professional and academic interest of medical radiation science students

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Abstract

This research analyses the interest that medical radiation science (MRS) students have about their academic and professional world when they are given the independence to freely choose a topic to research. The research setting includes students of three different MRS degrees who have had, up until the point that this research was carried out, more common learning than degree specific learning. To analyse student interest, a thematic analysis of the self selected topics to be researched for a group work project was undertaken. The results indicate that there are statistically significant differences in interest between students of the three MRS degrees, with students within a degree sharing a strong single unifying common interest in their academic or professional world.

Introduction

From 1997 to 2004 students in the second year of the Bachelor of Medical Radiation Science (MRS) degrees at the University of Newcastle completed a 10 week group work conference poster learning and assessment task during semester two (August – November). The task was designed firstly to allow students the experience of working as part of a collaborative group and learn a range of skills that would be useful in real world team based workplace situations, and secondly to allow students to investigate a topic of their own choosing as a way to engage their intellectual curiosity (interest) about their academic and professional world. The group work task was undertaken after students had completed up to 12 weeks of professional placement so that they had sufficient clinical background to investigate an area of professional interest.

Interest in an academic program of study plays a significant role in increasing the retention of students in a program and career choice ^(1, 2), and in recent years Australian universities have investigated and implemented projects to decrease attrition rates ⁽³⁾. In Australia it is estimated that attrition from university programs has a cost of around Aus \$1.4bn dollars (£0.84bn, € 1bn) with the rate of attrition of students from programs across a number of Australian universities ranging between 9.7 – 24.2% ⁽⁴⁾. The research pertaining to interest orientated learning emerges from the viewpoint that learning is not a purely cognitive function but also has an affective dimension, where learners become emotionally engaged at a higher level when they are interested in a topic or activity ⁽⁵⁻⁸⁾. Research indicates that interest orientated or interest based learning is strongly associated with positive learning outcomes including the likelihood of engagement at a deep level of processing. Interest based or orientated learning is associated with the development of intrinsic motivation to learn, and autonomy or self-determination in learning ⁽⁹⁻¹¹⁾.

From 2005-2007 the task was moved to semester one as a result of wide spread program changes at the university, and the new program environment meant that students would only complete five weeks of professional placement prior to undertaking the poster task.

Academics commented that these changes reduced the quality of the posters submitted, and students commented that their limited clinical experience to complete the project did not give them adequate professional understanding or time to engage their interest and work collaboratively with other students to complete a high quality submission. In 2008 the poster project returned to the second semester of the program.

Each year up until 2002, students on completing the poster task were asked to respond to a short response questionnaire that sought to analyse the content of their learning within the group work environment. The questionnaires were reviewed each year as a quality assurance teaching process which would provide immediate feedback to the lecturing staff about the learning outcomes of the task for the students. Following the changes to the sequencing and length of the poster task, and the noting of changes in the quality of the submitted work, a structured research based analysis commenced on the 1997-2002 questionnaire dataset seeking to describe the content of learning and the conceptions of learning that students held for the 10 week semester two group work task. This work was undertaken as part of a research higher degree by one of the authors. Within this research, it became possible to assess whether students had an inherent and developing interest in their program of study that matched the profile of the career they had chosen. This paper represents the first in a series of outcomes arising from the full analysis of this data, and reviews the analysis of student interest as expressed by their poster research topic. Although the data was collected some time ago the outcomes of the research are still relevant as they provide information to identify the interest that students have for specific MRS programs. This may be of use in identifying those who may be more suitable for a specific MRS program and career.

Research has generally analysed interest orientated learning from two different perspectives: individual interest dimensions and situational interest dimensions. Individual interest is considered to be related to the personal dispositional qualities of the learner and has an enduring quality leading to long term knowledge, skills and attitudinal development. Individual interest is considered to have value-related and feeling-related valences: value related valences are associated with the personal significance that the learner places on learning, while feeling-related valences are associated with both positive and negative emotional states experienced when students are engaged either in a particular learning activity or learning about a particular topic ⁽¹²⁾. Situational interest is seen to be related to cognitive and/or emotional engagement with a specific topic or a particular learning activity, perhaps at a particular time, and while effective in engaging learners' situational interest may have a shorter term effect on knowledge and value gain ⁽¹³⁾. There is general agreement that interest orientated learning relies on aspects of both individual and situational interest, and that learning initially engaged by situational interest can transform over time into dispositional individual interest qualities ⁽⁹⁻¹³⁾.

Most interest orientated learning research has been undertaken to identify the theoretical constructs of interest, for example cognitive versus affective effects, personal versus situational interest, and the characteristics that develop interest; or the qualitative outcomes of interest based learning, for example the recall of hierarchical structural elements of learning or the use of learning strategies. Much of the previous interest based research has used experimental or cross-sectional designed, text based comprehension methods, which are techniques commonly used in cognitive psychology and educational research ^(10, 12). In this type of research individual students read set pieces of work and are then asked a series of questions about the reading and their interest in the work. Interest in the reading is often evaluated in light of what can be recalled (for example does interest in a topic heighten learning?), or the stimulus provided to the student by the reading, (for example the analysis of behavior or cognitive development or modification with particular interest themes in a

reading). This style of interest orientated research provides for broad or specific generalizations to be made about the concept of interest and its effect in promoting a learning or behavior response.

The interest orientated learning research reported within this paper is undertaken in a more naturalistic learning research setting, and borrows heavily from phenomenography and the interpretive perspective ⁽¹⁴⁻¹⁸⁾. In this research students were given the opportunity to freely choose, based on their intellectual curiosity (interest) about their professional and academic world, a topic to research. A common interest in a specific topic was the stimulus for students to form collaborative groups in which to complete the task. The research questions that students formulated and that guided all learning within the task were analysed thematically to identify the qualitatively different dimensions of professional or academic interest expressed by the research questions.

The Student Participants

The students involved in this research were enrolled into one of the three Bachelor of Medical Radiation Science programs at the University of Newcastle (UNewc), Australia. The three programs are in the professions of Diagnostic Radiography (DR), Nuclear Medicine (NM) and Radiation Therapy (RT).

At the University of Newcastle, students of the three degrees participate in common teaching and learning, and undertake common assessment, in those areas of shared professional knowledge and skills. Examples of this include all students doing the same:

- anatomy and bioscience, physics and instrumentation
- psychology and sociology
- ethics and health law, communication, evidence based practice, occupational health and safety and infection control, and library informatics and assignment writing

- clinical decision making, critical appraisal and research methods

The students also undertake degree specific clinical knowledge and professional placement courses in each of the three years of the program. In lectures and tutorials, in skill development laboratories at University, and on professional placement in hospitals and private practices, students of each of the three degrees develop specific professional skills and are socialised to their professional practice and culture ⁽¹⁹⁾.

The task that is reviewed in this research commences at the beginning of the second semester of year two of the program. All year two students participate in the task. Up until this point 75 of 120 units of study (62%) have been shared common learning, with the remaining 38% being profession or degree specific learning including professional placement. Given this proportion of shared knowledge and skill learning it might be expected that students within the different professional degree cohorts would develop shared or similar interests.

The Collaborative Group Work Task

Much of the pioneering and influential research on learning, learning styles ⁽²⁰⁾, approaches to learning ⁽²¹⁾, the environmental factors affecting learning ⁽²²⁾, the motivations for learning ⁽²³⁾, and conceptions of learning ^(18, 24), has been undertaken in the traditional context of the individual student learning and being assessed within a direct instruction teaching model. It has been suggested that while this behaviourist model of teaching and learning is effective for teaching content, there is less evidence that it allows for high order cognition and independent flexibility in learning ⁽²⁵⁾.

Since the 1980s teaching and learning have gone through a social, cultural and technological revolution. Teaching and learning now includes learning experiences where students work in less traditional situations and in more active learning and technology

orientated contexts ^(26, 27). These learning contexts imitate society's modern day complexity, allowing for learning in complex group information processing and learning situations. The Australian business and higher education sector has emphasized the qualities it requires in graduates, to meet the demands of the modern world, are those of knowledge creation, problem solving and communication within a team work based organisational structure ⁽²⁸⁾.

Many universities, including the University of Newcastle, now recognise the need for students to engage with each other in their learning. Many professional programs at university have been designed in recent years to take advantage of the high order learning outcomes that group learning provides ^(29, 30). Group work and group learning adds a dynamic to the context of the learning and assessment environment not found in the traditional solo student learning situation.

The poster learning and assessment task, from which this research emerges, required students to work with a group of 4-5 students from their professional degree, to develop a conference poster that examines an aspect of academic or professional knowledge or practice. The students worked together over 10 weeks to complete the task, and the task included a learning phase and an assessment phase.

The learning phase firstly involved all students nominating topics that they were interested in researching. The topics were discussed openly in class by the students during week one of the semester and all students had the opportunity to hear the interest orientation of their fellow students and ask questions about it. Topic lists were placed on notice boards and by the middle of week two students had formed collaborative research groups based on their shared interest for a topic. The topic was then researched from an evidence-based perspective with students firstly formulating a meaningful question on the topic to be investigated, and then secondly collecting and critiquing a range of evidence to answer the question asked. The student groups assumed the responsibility for the collection and

critique of the evidence, as well as learning the requirements for effective poster design and production. All student groups had an academic staff member as a project supervisor, whose role was to ensure the group maintained focus and worked towards the production of the poster. The task was designed to engage students with each other and benefit from the deeper learning that can be acquired from social constructivist learning ^(25, 31, 32).

For the assessment phase, students within their groups assessed the posters created by all other student groups. Students then, on reflection of the quality of the work of all other groups, assessed their own work ⁽³³⁾. The poster was assessed using an assessment rubric developed by academic staff. The assessment focused on the content of the poster, the presentation aspects of the poster in engaging its intended audience, and the requirements for academic presentation of information in a poster format. The mark given to individual posters by each of the groups was averaged to obtain the poster mark which all students in the group received. Peer assessment was used to provide feedback to group members about their level of activity within the project and if necessary the peer assessment was used to moderate the marks of individual students within a group ⁽³⁴⁾.

During the period of the study, the development of the poster learning and assessment task was guided by the research question asked by the student group, with the poster research question reflecting the content of the poster. The poster question should therefore reflect the interest students had about their professional world ^(12, 23).

Research Method

Data Collection

On completion of the learning and assessment phases of the poster task all students were asked to individually complete a short open ended response questionnaire which sought to analyse the personal and important content and conceptions of learning (structural and

referential elements of learning) held by individual students when learning and being assessed within a group work task. The questionnaires formed part of the poster learning and assessment task and therefore contained the student name, strand of MRS they were from and their poster research question, as well as their responses to the question asked. To ensure anonymity during the 2007 data analysis of the responses, the questionnaires were de-identified (names were removed) by one of the authors (HWF) and only photocopies of these documents were used. It is these research questions along with the strand of MRS written on the returned questionnaire, that were analysed by the other author (SD) using a thematic content analysis methodology. Because the poster task was undertaken in groups, with a single research question being asked per group, all questionnaires were sorted into their respective poster groups according to the research question.

Time Frame and Ethics Approval

This research was conducted between 1997-2002 with data collection occurring each year. The responses of the students to the open ended questionnaire were reviewed each year by the researcher (SD), in the role as the academic who coordinates this task, as a rapid reply qualitative feedback mechanism to monitor and improve the task year by year. The analysis of interest as expressed by the research question asked by students occurred in 2007. Approval for this research was granted by the University of Newcastle, Human Research Ethics Committee.

The Researchers

The researchers are MRS academics, one a radiation therapist and the other a medical physicist, each with more than 15 years academic experience in both MRS and health science teaching and research. Both researchers undertake their own research, and supervise research higher degree students, that regularly require interpretative methods of data analysis. The analysis of the poster research questions in this research had not been part of any previous evaluation and therefore the analysis of interest described within the

poster questions represented a new analysis of which there were no pre-conceived outcomes held by the researchers. Indeed no such analysis or similar study was found in any literature to influence the view of the researchers. To ensure that neither researcher were imposing personal beliefs or meanings on the reading and interpreting of students' poster questions, and that the researchers were staying true to the data, the researchers regularly met and checked or bracketed any personal developing assumptions about the study ⁽³⁵⁾.

Validation Study

To ensure that the poster research question, as the unit of data to be analysed, did in fact represent the content of the poster and the interest expressed within the poster, a validation study occurred where a sample of posters was analysed for the level of agreement between the poster question reflecting the content of the poster and hence the interest expressed by the poster question. Ten (10) posters developed as part of the project in 2003 were reviewed by researcher 1 using a thematic analysis / content analysis methodology. Each poster was read in its entirety and the main topic of academic or professional interest or the central message of interest that was described in each poster was compared to the poster research question asked (Table 1).

Table 1: Example of the analysis of the orientation interest of a poster research question and the poster content

Poster Question: What are the roles of 3-D CT images in facial surgery

Interest Orientation: The poster question focuses on the roles of 3-D CT technology. Although facial surgery is mentioned in the poster question, the question is not asking questions about issues related to facial surgery such as, pre or post imaging patient treatment or patient care, or surgical technique in facial surgery. The interest orientation of the poster question is guided towards the use of or role of technology.

Content of the Poster: The poster describes the role of CT and the process of CT with particular reference to image reconstruction, volumetric measurements and CT displayed anatomy for a range of clinical situations. The poster describes three central roles of 3-D CT in facial surgery, these being pre-surgical planning, surgical simulation and post surgery evaluation, with reference to the pathologies of malignancy, congenital abnormalities and trauma. However, the emphasis of the poster is on the role and use of technology.

Interest Orientation: The central message given within the content of the poster is a description of the role and use of technology.

Summary: The Poster question and the poster content are reflective of a single interest orientation, the poster question is reflective of the content of the poster, with the expression of interest orientation guided towards a review of technology.

The review confirmed that, in all ten posters examined, the poster research question was highly reflective of the interest and content expressed within the poster, and that therefore the research question asked by students could be used as the expression of interest of the students.

Data Analysis

The poster questions from 1997-2002 were thematically analysed using a content analysis methodology⁽³⁷⁻³⁹⁾. Content analysis is the name given to a broad range of techniques and methods that can be used to analyse text and other message forms. Content analysis allows for both quantitative and qualitative interpretation and analysis, and it can be used in mixed methods research analysis, allowing for the phenomena under study to be viewed in different but complementary ways. Usually the outcomes of a thematic interpretive content analysis are the development of a range of qualitatively distinct categories of description of the phenomena under study.

To gain a feel for the range and variation of the poster questions, the poster questions were read in their entirety starting chronologically from the 1997 data. The reading of the entire data set provided the researcher with an understanding of the perspective of the students in developing their poster question, as well as allowing the formal analysis of each poster question to be undertaken based on the reflection of all responses.

The researcher began the formal analysis of the poster questions by again reading all poster questions, once again in chronological order starting with the 1997 responses. This time the researcher examined the message contained in or expressed by each poster question response, with the intention of developing a range of categories that represented the qualitatively distinct differences of academic or professional interest described within the poster question. These categories of interest would form the measures against which all responses would be coded.

In developing the categories of interest, the researcher attempted to ensure that:

1. each category and the descriptions of interest associated with that category, were mutually exclusive from all other categories and other descriptions, so that a single response could be coded into one category only, and
2. all responses provided by students could be coded into a category

In recent times qualitative researchers have discussed the requirement that interpretative analytic methods leading to thematic categories of description, like content analysis, should demonstrate a conceptual or functional relationship between the themes or categories of description ⁽⁴⁰⁾. In analysing the data and developing categories of description the researcher attempted to consider the conceptual relationship of the data and outcomes to each other.

The analysis process involved the reading of the first poster question from the first student group, and the main topic of interest to be described or emerge from the first response was manually written (recorded) at the top of a blank page along with some qualitative descriptors of the interest. The second poster group question was then read and if the response represented a qualitatively different topic of interest from the first response then it was written at the top of a different page. If the second response when read was considered to be associated to the first topic of interest recorded, it was written underneath the first response. This process was followed for all responses, with poster questions being recorded either under previously described data or by the creation of a new qualitatively different description of interest.

Examples of the poster questions that were analysed included:

“What are the clinical indications for imaging in acute ankle injuries?” (2000)

“Can Positron Emission Tomography be used to diagnose natural born killers” (2000)

“How do you identify depression in cancer patients?” (2001)

“Does scatter radiation from mobile Chest X-Ray radiography pose a threat to the allied health care team? If so how can it be minimised?” (2002)

On completion of this process, the researcher reviewed the developing categories of description according to the previously described criteria, constantly reflecting between the descriptions listed and the developing categories of interest. The outcome of this analysis was the construction of three distinct categorical descriptions of student group interest as described by the poster questions. These categories were given a descriptive title which represented the academic or professional aspect of interest expressed by the collective of data in each category.

To further ensure the trustworthiness of the descriptive categories in representing the categories of interest of the students uncovered in the thematic analysis ⁽⁴¹⁻⁴³⁾, all poster questions were subject to a further coding process, using a purposefully designed coding scheme. The coding scheme was described by the interest category name, a descriptive characterisation of each interest category, and examples of poster questions that characterised the category (Table 2).

Table 2: Coding scheme for coding Interest

Code 100 = Interest in Clinical Procedures and Clinical Skills
<p>The category of clinical procedures and skills was characterised by poster questions which attempted to:</p> <ul style="list-style-type: none"> ➤ compare clinical procedures or processes, ➤ explain the rationale for certain clinical procedures, ➤ examine the requirements for better imaging or treatment, ➤ review the clinical skills required in certain situations or ➤ examine professional role and function
<p>Examples of questions within this category included:</p> <ul style="list-style-type: none"> • Does the radiographer have a role in Accident and Emergency reporting? • Total Body Irradiation – what are its uses in Radiation Therapy?
Code 200 = Interest in Patient Management and Patient Care
<p>The category patient management and patient care was characterised by the questioning of:</p> <ul style="list-style-type: none"> ➤ outcomes for patients of imaging or treatment, ➤ the influence or effect of imaging or treatment on patient care or patient management, ➤ the basis of patient care and improved patient care, ➤ ethics or health law or communication
<p>Examples of questions within this category included:</p> <ul style="list-style-type: none"> • Head and neck radiation therapy – how can common side effects be minimised? • When should a parent be in the room (to assist the child)?
Code 3 = Interest in Technology and Technology Assessment
<p>The category technology and technology assessment was characterised by poster questions which:</p> <ul style="list-style-type: none"> ➤ analysed specific technology or technology more generally ➤ compared technology

➤ used technology as the impetus for the question
<p>Examples of questions within this category included:</p> <ul style="list-style-type: none"> • CT v Ultrasound in the detection of appendicitis? • Multi Leaf Collimators – what are the advantages?

One of the researchers (SD) coded all poster questions on the grouped questionnaires using the coding scheme. Two research assistants, who were trained to code all questionnaire responses in the larger content and conception research project, independently reviewed the coding of the researcher as part of their coding activities for the larger study. On completion of all coding the research assistants met with the researcher and final coding was agreed. On completion of this process all poster questions had been coded against one of the emergent themes.

The coded data was entered into Microsoft Excel 2007 (Seattle, USA) and the relationship between the data was analysed using non-parametric models of categorical analysis (chi-square analysis).

Results

Numbers of Posters Analysed

There were 234 diagnostic radiography students, 36 nuclear medicine students and 58 radiation therapy students (328 students) enrolled to complete the task during the six year study period 1997-2002. In replying to the content of learning study, from which this data and analysis emerges, there were 279 returned questionnaires (response rate of 85%). These responses represented 77 separate posters developed by the student groups during this period. Table 1 provides the breakdown between the three professional programs for the 77 posters reviewed in this research.

Table 1: Numbers of poster groups by program and year

DR = Diagnostic Radiography

RT = Radiation Therapy

NM = Nuclear Medicine

Year	No of Groups			
	DR	NM	RT	Total
1997	6	-	4	10
1998	9	2	-	11
1999	6	-	4	10
2000	11	3	-	14
2001	11	-	5	16
2002	12	1	3	16
Total	55	6	16	77

It needs to be noted that up until 2001 the radiation therapy and nuclear medicine programs were run as alternate year intakes.

Qualitative Analysis of Interest

Three qualitatively different categories of student group interest emerged from the analysis of the poster questions. These categories of interest were expressed as an interest in (listed alphabetically):

1. Clinical Procedures and Clinical Skills
2. Patient Management and Patient Care
3. Technology and Technology Assessment

The Differences in Interest within and between the Degrees

The analysis of interest demonstrated that within each of the three degrees there was a:

- high level of interest on a single interest category expressed by most students of that degree, and
- that there were statistically significant differences between the interest of the three degree groups of students (Figure 1).

In terms of the self selected poster questions that students asked of themselves, diagnostic radiography students asked questions that expressed more interest in clinical procedures and clinical skills (68%), nuclear medicine students expressed more interest in technology and technology assessment (72%), and radiation therapy students indicated more interest in patient management and patient care (59%).

Figure 1: Interest by student group degree

Rather than the remaining two categories of interest being equally divided within each of the three degrees, each of the degrees expressed relatively low interest in one the three interest dimensions. Diagnostic radiography students expressed less interested in patient management and patient care (8%), nuclear medicine students expressed less interest in clinical procedures and clinical skills (11%), and radiation therapy students expressed less interest in technology and technology assessment (7%).

The stability of interest over time was assessed by analysing the diagnostic radiography responses that were available for each year of the research. The result was remarkably stable (Figure 2), with clinical procedures and clinical skills the dominant category of interest researched every year. This result was statistically significant.

Figure 2: Interest by diagnostic radiography students over time

Discussion

Diagnostic radiography is an imaging profession that makes use of a large variety of technologies (for example: x-ray, CT, MRI, sonography, digital and computed technologies) to image a large range of acute trauma and chronic illness in a wide range of patients (for example: musculoskeletal imaging, cardiovascular and respiratory imaging, neurological imaging, adults, paediatrics and neonates) in a large range of clinical situations (for example: in private and public; in metropolitan, rural and regional centres; in wards, theatres, accident and emergency; specialist procedures). The role of the radiographer varies greatly between centres in Australia. Some larger centres have the support of other health and medical staff in the triage and referral of patients, they have radiology specialist who undertake the diagnostic interpretation of the acquired images, and the radiographer's role is a traditional one of accepting a referral and completing an imaging examination. In other centres, which may lack inter-professional imaging or patient support, such as in rural imaging centres, the role of the radiographer may include patient triage, communication with non-radiology medical staff regarding the appropriateness of medical imaging requests, image

interpretation and post procedure patient management and referral ⁽⁴⁴⁻⁴⁶⁾. Imaging pathways are at times complex and multiple ⁽⁴⁷⁾, and judgements about a patient's imaging need to be made considering the presentation of the patient, the technology available to the department, the availability of specialist imaging radiography staff, and the role that radiographer plays in that department. Most imaging procedures are undertaken over a short time frame, with little time to develop a significant patient rapport.

Radiography students within this research have asked questions of themselves that characterised their interest as wanting to examine and rationalise the complexity of modern clinical diagnostic imaging practice. Issues researched within the clinical procedures and clinical skills category included the clinical indications for imaging; protocols for imaging; the necessity for imaging in specific clinical situations; radiography ethics and health law; advanced radiography roles, image interpretation, and increasing clinical autonomy.

Radiation Therapy is a cancer treatment based profession. The role of the radiation therapist includes imaging to acquire detailed multi-dimensional patient anatomical information (simulation), the accurate mapping of all tumour and non-tumour organs and systems within the body and the design and planning of high energy radiation beams placed strategically throughout the body using advanced software programs, and the daily treatment of cancer patients over 6-8 weeks using a limited range of treatment technologies. A diagnosis of cancer and its ensuing treatment can have physical, functional, emotional and social effects on a patient. Radiation Therapists have a large role in monitoring the quality of life of their patients and adopting strategies to improve their daily lives. The role of the radiation therapist is highly patient care focussed and this is acknowledged internationally ⁽⁴⁸⁻⁵⁰⁾.

Radiation therapy students within this research have asked questions of themselves that characterised their interest being concerned with patients, patient outcomes, and the ability

to support patients. When discussing clinical procedures or technology it is done within the realm of improving patient outcomes.

Whereas diagnostic radiography has a focus on the visualisation of normal and abnormal anatomy, nuclear medicine uses chemical agents, known as radiopharmaceuticals, to image the function or physiology of organs or body systems ⁽⁵¹⁻⁵³⁾. The role of functional and molecular imaging is growing and plays an important role in skeletal, neurological, oncology, and cardiac imaging. Nuclear medicine has the ability to demonstrate the presence of cancer cells and cancer spread much earlier than may be detected with other diagnostic imaging modalities, and nuclear medicine is playing an increasing role in cancer staging and tumour volume rendering. The technology, and the use of technology, is growing and there are developing hybrid technologies that integrate anatomic and functional imaging into a single system ^(54, 55).

While the number of nuclear medicine student groups participating in this research was small (n=6), and caution should be taken in generalising these results, within this research the nuclear medicine students characterised their interest as wanting to compare and contrast the role of current and emerging nuclear medicine technologies in modern practice. There was a strong interest in recognising nuclear medicine imaging technologies as an alternative or adjunct to mainstream diagnostic imaging methods. This interest appears to be far greater than the interest in debating clinical practice procedures or skills, or the post imaging management of patients.

The student interest expressed by the poster topics appears to be strongly influenced by the role and function of the practitioner which the students experience during periods of professional practice and learn about in their academic studies. By year 2 the three groups of students do not share a strong overlapping or mutual interest in a specific dimension of

MRS practice but they have aligned their interest with the specific professional degree they are studying.

The dimensions of student interest reported in this research by diagnostic radiography and radiation therapy students aligns well with the descriptions of advanced practice within each profession in recently released professional documents. In the Australian of Radiography's report entitled 'Discussion Paper: A Model of Advanced Practice in Diagnostic Imaging and Radiation Therapy in Australia' ⁽⁵⁶⁾, diagnostic radiography advanced practice roles are titled in relation to clinical examinations, for example clinical specialist in Fluoroscopic and Interventional Imaging, Ultrasound Imaging, Computer Tomography, Magnetic Resonance Imaging, whereas radiation therapy advanced practice roles are titled in relation to patient presentations or patient management, for example clinical specialist in Paediatric Radiotherapy, Palliative Radiation Therapy and Treatment Review.

Conclusion

This research used interpretative data analysis methods that have become popular in a range of educational and qualitative research methodologies. The methodology analysed the natural product of student learning to evaluate the learning messages they contain rather than placing students into a learning experiment where answers to predetermined questions are evaluated. This method of analysis and use of data provides a new and novel method for academic staff to assess what students learn.

The analysis of the written research questions of the year 2 students completing the group work task, highlighted that diagnostic radiography, nuclear medicine and radiation therapy students, express their main interest about their professional and academic world in different domains of professional and academic learning and practice. The different domains of interest are, on reflection, highly descriptive of the clinical worlds of the professions and support the notion that the professions, while complementary, are different and may require

practitioners who have a deep personal interest aligned with the professional role. The outcomes do provide a degree of evidence that the academic program at the university is aligned well to the professional role, and that students within their program recognize important dimensions of professional practice and interest.

While not directly measured within this research, this research is suggestive that perhaps some students, based on their personal interests, are more suited to one particular health profession than another, and that student selection for professional programs could be made better by considering the interest and motivation of applicants for a program of study and career. This does support previous published work by one of the authors of this paper in evaluating the personal qualities required for effective professional practice in the various disciplines of medical radiation science ⁽⁵⁷⁾.

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