

The NSW Radiation Therapy PDY educational program. A review of the 2002 and 2003 programs

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Abstract Each month, nine radiation oncology departments in the public health sector in New South Wales host a one-day educational program for graduate practitioners completing their professional development year (PDY). Various topics are presented which are considered relevant to graduates in the transition from the academic environment to full time work in busy clinical departments. This paper presents the findings of a review of the NSW State Radiation Therapy PDY educational program for 2002 and 2003 instigated by the NSW Chiefs Group. The program was evaluated to determine whether it enhanced the learning experiences of graduate practitioners during the PDY. The results indicate the educational program has been successful in enhancing the skills of the radiation therapy graduate practitioners. This finding suggests the program is having a positive impact on the experience of the graduate practitioners within radiation therapy in NSW.

Introduction

The first Bachelor degree students in radiation therapy graduated in New South Wales (NSW) in 1995. However, since 1992, the Australian Institute of Radiography (AIR) has required all university graduates in radiography and radiation therapy to complete a full time 48-week professional development year (PDY) to enable graduates to attain the status of accredited practitioner.¹ In the PDY, new graduate practitioners are obliged to work in clinical practice under the close supervision of radiation therapists with two or more years post-qualification experience. They cannot be placed in a sole practitioner situation as development of their knowledge skills and attitudes would be compromised.¹

Nevertheless, as a result of the shortage of experienced radiation therapists (RT), it has been observed by the profession that, during the PDY, RT graduate practitioners within NSW received varying levels of mentoring. Additionally, current work practices encourage the new graduate to become a team member much sooner than was initially intended and hence the graduate practitioner is given little opportunity to make the mediated transition from an academic to a clinical environment. To improve the consistency and quality of information obtained by all RT graduate practitioners in NSW, the NSW State RT PDY educational program was created in 2002 by the NSW Chiefs Group. The Chairperson of the PAEC (the governing body that is solely responsible for instigating educational programs for the graduate practitioners) was a member of the Chiefs Group, which gave authority to the Chiefs Group to instigate this educational program.

The NSW State RT PDY educational program involves a monthly education day for RT graduate practitioners in different centres in Sydney and surrounding areas. Nine clinical centres are involved in the program with each department hosting one educational day. Each department presents information associated with cancer care at their hospital. A variety of topics

are covered including: patient care, physics, radiation therapy techniques, professional issues and communication skills. The program is designed to consolidate radiation therapy knowledge and to explore issues that the graduate practitioners may have learned in the academic setting or had been exposed to since they commenced work. This learning approach is similar to that applied in a nursing internship program at a US navy hospital.²

Currently, we are not aware of any published literature on education programs implemented in the same structure or format as the NSW state RT PDY educational program.^{2,3,4} The need to extend the knowledge of graduate practitioners from other professions on different clinical processes is catered for with a rotational clinical program between departments.² Alternatively, tertiary institutions are also involved in the delivery of programs such as residency programs.⁵ Due to the unique design of the educational program for new graduates it is therefore imperative that the effectiveness of the program is measured so that the needs of the participants can be addressed.

Each centre's program was evaluated by means of a survey. The survey was initiated and designed by the coordinator of the first participating centre in 2002 and approved by the NSW Chiefs Group for continued use throughout its program. The survey comprised of two elements: a process evaluation and an impact evaluation. The process evaluation was implemented to determine the effectiveness of the delivery of the program and the impact evaluation was conducted to determine whether learning outcomes by the graduate practitioners were enhanced by attending the education day.

Methodology

Cross-sectional study design

The design of the study was a prospective survey of all graduate practitioners that attended the monthly lecturers in NSW hospitals. After each days attendance an identical survey was given

to evaluate that day's program.

The public hospitals that hosted the radiation therapy NSW RT PDY educational program distribute the surveys to the RT PDY practitioner attendees in 2002 and 2003 and return them to the internal evaluator. The nine hospitals that hosted the educational program were Liverpool, Nepean, Newcastle, North Shore, Prince of Wales, Royal Prince Alfred, St George, Westmead and Wollongong. Invitations were sent to all NSW graduate practitioners from public and private radiation oncology centres to participate in the educational program.

Ethics

At the completion of the educational program, the graduate practitioners were asked to voluntarily complete the program evaluation forms. Consent is assumed upon the return of the completed evaluation form. There was anonymity in the completed evaluation forms, as the graduate practitioner did not require identification. Human Research Ethics Committee (HREC) approval was not requested since a program evaluation is a quality improvement initiative designed to ensure that the expected quality and standard of the new educational program for the graduate practitioners is provided. The National Health Medical Research Council (NHRMC) Guidelines advising that 'an appropriately planned activity can proceed without review of the HREC if the activity is undertaken with the consent of the patients, carers, health care providers or institutions involved and where the participant are unlikely to suffer burden or harm'.⁶

Program evaluation data form

The graduate practitioners were asked to rate the teaching style, content of information to clinical practice and applica-

tion to clinical practice to all topics presented using a four-point Likert scale. The participants were also asked to write comments for each topic presented and the data analysis of this program evaluation was performed in teaching style and relevance of information to clinical practice.

The four-point Likert rating scales are:

- 1 = strongly disagree
- 2 = disagree
- 3 = agree
- 4 = strongly agree

A code of zero was used to identify those cases where the question was not applicable.

Definition of each category

a Process evaluation: teaching style category

The Teaching Style Category measured the effectiveness of the program delivery for each session. The 'evaluation of process aims at determining the extent to which the plan worked and the nature and impact of unintended consequences'⁷ (p128). Thus, process evaluation monitors the adequacy of the plan in action

b Impact evaluation: content of information category and content relevance

The content of information category examined the relevance and quality of information of the session. Impact evaluation measures the extent the program has produced the expected outcome.⁷

Analysis

The analysis consisted of two parts:

a Individual host centre

Each individual host was asked to collate the comments and average scores of both the teaching style and content of information categories for each topic presented.

The hosts were also asked to report the audio-visual tools used,

Table 1 Inclusion criteria of content classification group

Content Classification Group	Presenter	Topic
Physics	Medical physicist	Radiation medical physics
Case study	Radiation oncologist or medical physician	Cancer diagnosis, pathology, treatment and outcomes
Technical	Radiation therapist	Simulation, planning and treatment techniques
Communication	Allied health psychologist and human resource development manager	Communication between the health carer and the patient Team work communication
Patient Care and Support	Nursing, Allied Health, Previous cancer patients	Role of cancer health carers eg dietician, nursing, social worker/psychoncologist Available cancer support programs
Professional Issues	Radiation therapist	Union issues, Occupational health and safety, Continuing professional development, Australian Institute of Radiography, Stress management and job satisfaction
Communication and issues	Radiation therapist, Radiation therapist, Radiation oncologist	Communicating effectively to managers on professional Role of radiation therapist in clinical research Evidence-based medicine

Table 2 Number of presentations in each teaching style category

Classification	No. (%) in 2002	No. (%) in 2003
Powerpoint (didactic)	9 (25%)	27 (57.4%)
Overhead Transparencies (didactic)	1 (2.8%)	1 (2.1%)
PPT and Interactive discussion	7 (19.4%)	12 (25.5%)
Video	2 (5.6%)	0
OHT and Interactive Discussion	2 (5.6%)	2 (4.4%)
Demonstration	7 (19.4%)	1 (2.1%)
Interactive Discussion	7 (19.4%)	3 (6.4%)
OH, PPT, Discussion	1 (2.8%)	1 (2.1%)
Total	36	47

Table 3 Number of presentations in each content of information category

Classification	No. in 2002	No. in 2003
Physics	2 (5.6%)	7 (14.9%)
Case Study	4 (11.1%)	3 (6.4%)
Technical	12 (33.3%)	20 (42.5%)
Communication	1 (2.8%)	2 (4.3%)
Patient Care and Support	12 (33.3%)	8 (17%)
Professional Issues	4 (11.1%)	3 (6.4%)
Communication and Professional Issues	1 (2.8%)	1 (2.1%)
Research	0	3 (6.4%)
Total	36	47

and level of interaction between the participants and the facilitator for each session delivered.

b Program evaluation coordinators: internal evaluators

The collated average scores of the educational program from each host centre were sent to the internal evaluators, Academic Tutor and Radiation Therapist Educator of Westmead Hospital, Department of Radiation Oncology. The internal evaluator was selected on the basis that they were the only RT practitioners at that time in NSW employed exclusively for coordination of educational activities and had appropriate educational qualifications to support this evaluator's role. The evaluation results were used to inform, by email, the NSW chief radiation therapists on the degree of success of each centre's RT PDY educational program, prior to the commencement of the next centre's RT PDY educational program. The program evaluators adopted a rapid-feedback evaluation method that aims at providing the program organisers or internal evaluators feedback in a timely manner, allowing them to problem solve quickly once they are identified.⁸ The host centres were also asked to report to the program evaluation coordinator of the title, brief summary of the session and the occupation of the facilitator. This information in turn was used by the program evaluation coordinators to categorise the sessions by content (Table 1). The program evaluation coordinators reviewed the results each year and annual reports were distributed to the heads of the radiation therapy departments in NSW.

Results

Number of evaluation forms returned from graduate practitioners

In 2003, 33 graduate practitioners attended the program with a return rate of 162 evaluation forms. In 2002 25 attended. The return rate for the evaluation forms was not recorded for 2002 as at that time the information was not considered essential.

Host centre evaluation results

Of the nine radiation oncology centres that hosted the educational program, three centres in 2002 and one centre in 2003 did not submit evaluation results from their day.

Number of presentations

There were 36 presentations in 2002 and 47 presentations in 2003. The duration of the presentations ranged from 30 minutes to 100 minutes. On average, six presentations were delivered at each centre's educational program in 2002 and 2003.

Process evaluation: teaching style category

The sessions were delivered in a variety of ways using PowerPoint presentation, overhead transparencies and video. The interactions during the sessions were a mixture of limited group interaction (didactic lecture style) to interactive group discussion between the participants and facilitator. Table 2 shows the number of presentations for each classification group with the number as a percentage of that years total presentation. The most commonly used teaching style in both the 2002 and 2003 programs were the didactic presentation with PowerPoint used as the audiovisual tool. The least common modes in both 2002 and 2003 were overhead transparencies and a combination of overheads, PowerPoint with participant interaction. Video was not used in 2003.

a Frequency by rating in teaching style category

The histogram of frequency by rating in teaching style category (Fig. 1) illustrates that most of the RT PDY participants

agreed that the teaching style used was the appropriate method of delivering the content. In fact, there was a 13.2% increase in the frequency of presentations rated between 3–3.5 from 2002 to 2003. The annual distribution of process evaluation results of the PDY educational program to the program organisers in 2002 may have improved the delivery of the program in 2003.

Frequency of 'Agree' to 'Strongly Agree' (3–4) rating with each teaching style

Since 75.0% (27/36) of the presentations in 2002 and 87.2% (41/47) of the presentations in 2003 were rated agree or stronger in the teaching style category, it was decided to examine these in more detail. To account for the different number of presentations in each teaching style, the number of sessions in each rating scale was calculated as a proportion of the total number in that teaching style. An overall total was then obtained by combining the fractions of all classification groups in the agree to strongly agree rating. For example the PowerPoint didactic classification group in the teaching style category 2003 had 21 respondents in the 3–4 rating scale out of a possible 27. An overall total of 5.1 was then obtained by combining the fractions of all classification groups in the agree to strongly agree (3–4 rating) category. This was then converted to a percentage of the total value over the classification group in the 3–4 rating $0.777/5.1 = 15.2\%$. These results create the graph in Fig. 2.

Figure 2 shows that the graduate practitioners prefer to learn by interacting with their peers and with the facilitator as oppose to listening to didactic presentations. The teaching styles with interactions included group discussions, role plays and demonstrations. However, among the didactic presentations, the facilitators that used PowerPoint presentations were rated higher than those that used overhead transparencies.

Impact evaluation: Content of Information Category

From the session summary provided from each centre the

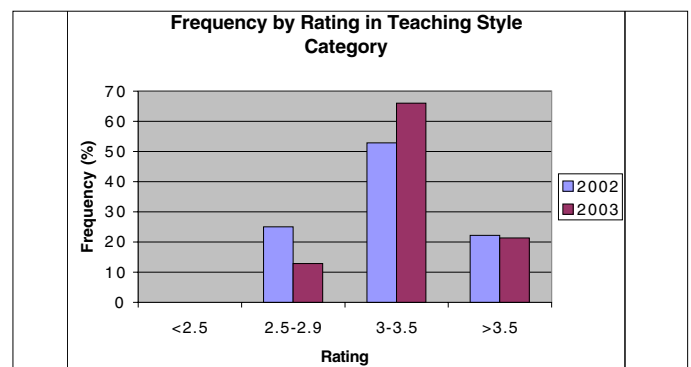


Fig. 1 Frequency by rating in teaching style category – distribution of results

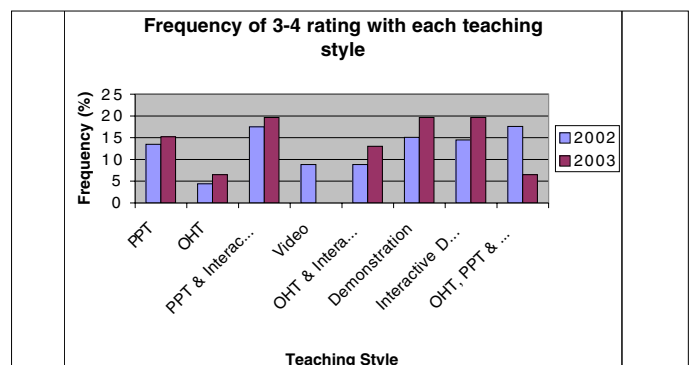


Fig. 2 Frequency of 3–4 rating with each teaching style

sessions were classified into one of the following radiation therapy based classification groups (Table 1). In Table 3, the number beside each theme classification group indicates the number of presentations in this area and as a percentage of that year's total presentations. The most commonly presented topics in 2002 and 2003 were from the technical classification. This classification included treatment, planning and simulation techniques. Equally as common in 2002 was patient care and support while in 2003 it was the second most common topic as there was an increased number of technical presentations. In 2003, physics presentations increased by 9.3%, whilst case studies (presented by oncologists discussing diagnosis, pathology, treatment techniques and outcomes), professional issues (union, career choices) decreased in presentations and research was introduced as a new classification group.

a Frequency by rating in content of information category

The histogram of frequency by rating in Content of Information Category (Fig. 3) show that the majority of the topics presented in 2002 and 2003 were found to be of relevance and importance to the PDY practitioners. There was a 30.8% increase in the frequency of > 3.5 rating between the presentations of 2002 and 2003 which may be partially attributed to the continuous feedback of graduate practitioners to the program organisers, ensuring that the educational needs of the participants are being met.

a Frequency of 3–4 rating in each classification group in content of information category

Similarly, 86.1% (31/36) of the presentations in 2002 and 89.4% (42/47) of the presentations in 2003 were rated Agree to Strongly Agree (3–4 rating) in each of the content of information category. These were also examined in detail.

Figure 4 shows that the most frequent content of information classification group rated as 'Agree' to 'Strongly Agree' (3–4 rating) in 2002 and 2003 were communication and professional issues, case study, technical and professional issues. The frequency of 3–4 rating in communication dropped in 2003 from 16.2% in 2002 to 6.3% in 2003. The least frequent 3–4 rating content of information category in 2002 and 2003 was physics.

The topics discussed in the 2002 and 2003 programs included, patient communication, staff interaction, patient's perspective. Despite the fact that very few sessions were given about communication issues in 2002 and 2003 (Table 3), it generated positive feedback from most of the graduate practitioners. Some of the positive comments were:

'It was good for our clinical environment. It will help us to talk to patients more.'

'Fantastic to hear the very real impact we as RTs can have on

patients' experience.'

'Seeing/hearing patients' views and experiences was very helpful.'

Recommendations from the 2002 Annual Report

The following recommendations were made to the Chiefs Group from the evaluation results of 2002 to take into consideration when designing their 2003 programs.

- 1 Learning is done effectively when the student is actively involved in the learning process.
- 2 Sessions containing some form of interaction and a high level audiovisual technology were considered successful.
- 3 It is important to consider all participants learning styles when planning the educational day and hence still incorporate several teaching styles (interactive, didactic, demonstration) into the program.
- 4 Consult previous and present graduate practitioners to ensure the topic is not revisiting undergraduate studies and if it is, present the information at a higher level.
- 5 Present topics relevant to the newly practicing graduate practitioners.
- 6 The educational program is also beneficial to the return to the workforce radiation therapists.

Discussion

This paper has attempted to identify factors responsible for good and poor learning through a structured survey of the participants of the NSW PDY program, in which the teaching style and the relevance and quality of information of the session have been examined. At the end of each PDY educational day, the formative evaluation results and recommendations for improvement in future programs were distributed to all host centres by email. The rapid-feedback evaluation model was adopted to ensure that the program organisers receive feedback within days. These feedbacks are used to optimise the performance of specific program processes allowing for rapid problem solving in the program operations.⁷ Rapid-feedback evaluation method has been shown to be successful in evaluating programs. McNall *et al.*⁷ successfully used rapid-feedback evaluation method in the evaluation of a new health care intervention to improve the program process.

The collated evaluations or summative evaluations are reported annually to the primary stakeholders, the chief radiation therapists of NSW. The summative evaluations has the purpose of assisting in making decisions whether to terminate a program⁸ or 'render judgments on the merit or worth of a program'.⁷ (p 292)

The summative evaluation results from the frequency of teaching style in the 3–4 category (Fig. 2) highlights that the majority

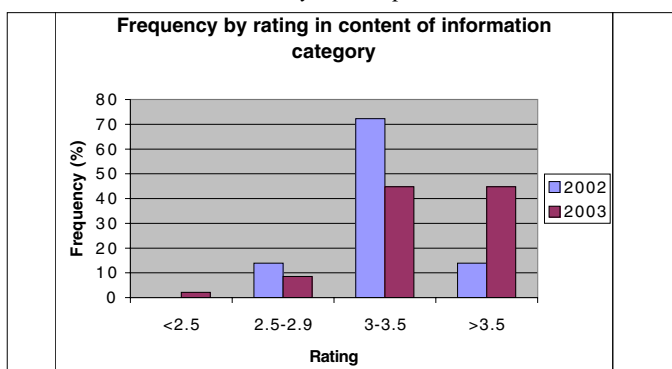


Fig. 3 Frequency by rating in content of information category

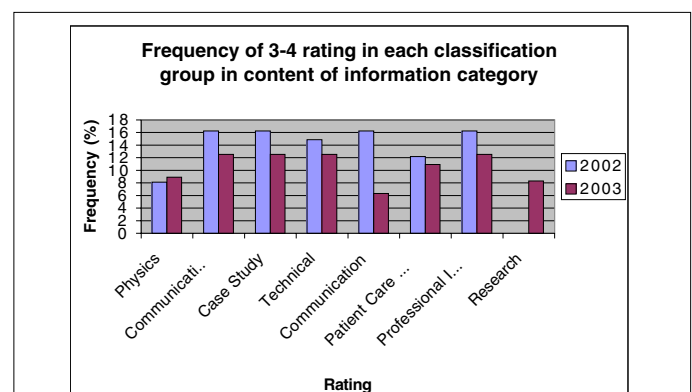


Fig. 4 Frequency of 3–4 rating in each classification group in content of information category

of sessions that were in this category contained some form of interaction (PowerPoint and interactive, demonstration and interactive discussion) these results support the notion that learning is done effectively when the student is actively involved in the learning process.⁹ Additionally, the use of an audiovisual medium such as PowerPoint is said to improve learning and retention efforts of the audience, which also supports the successful rating of PowerPoint presentations.¹⁰ (p 8)

A significant increase in higher-level audiovisual technology in presentations occurred in 2003. This may be due to the recommendations made from the 2002 program which considered high level audiovisual technology presentations as effective, alternatively, more presenters may have the PowerPoint resources readily available to them and may be familiar with them. The video presentations did not rate well in the effective teaching style in 2002 and the centres chose not to use it in the 2003 program. This suggests that as video does not allow for interaction it does not rate highly with the majority of learners whereas PowerPoint is able to incorporate interactive discussion and hence the frequency is higher in the 3–4 rating.

Content of information classifications varied greatly, this reflects the effort made by each centre in their program to provide the PDY practitioners with many different aspects of radiation therapy. This allowed the PDY practitioners to learn about a broad range of topics and assist in the motivation to learn by catering for a variety of interests.¹¹

The high frequency of communication and professional issues in the 3–4 rating followed by case studies compared to a lower frequency of technical presentations and the low rating of physics could be contributed to a combination of factors including repetition of topics already covered at university and its immediate relevance to their clinical practice. From this it can be postulated that some topics (eg. communication, professional issues and case studies) are now more relevant to the graduate practitioner and can be applied to their daily clinical practice.

The research classification group was added in 2003, to cater for the three new research presentations given which reflects the desire by the medical radiation science professions to increase its research opportunities and participation.¹²

The improvements in the evaluation results from 2002 to 2003 cannot be solely linked to the impact of the program evaluation. Factors such as different program organisers and presenters in the host centre's each year and/or combined with different educational philosophies held by the graduate practitioners in 2002 and 2003 as they were graduates from different tertiary institutions.

There are many advantages of using internal program evaluators or using the host organisers in each centre to evaluate their own programs. Apart from the expensive cost of hiring external program evaluators, the internal evaluators are very knowledgeable of the program contents as they directly involved in delivering the program and can decide on modifications of the program and disseminate evaluation results.¹³

In the future, it would be of benefit to measure the impact of the educational program on past graduate practitioners who participated in the NSW RT PDY educational program. How did the RT PDY educational program impact on their clinical practice? Has transfer of learning occurred? Have the past participants improved their level of patient care? Similarly, have the presentations in professional issues made past PDY practitioners more aware of ongoing or new issues in the profession? The long-term impact of the PDY educational program can be measured by

evaluating the level of transfer of learning by assessing participants of the NSW RT PDY educational program (eg. scenarios or case evaluations). The program evaluation coordinators predict that the PDY educational program has positive long-term impact on the clinical practice of the PDY participants that may potentially enhance their professional attitudes and further expand their clinical knowledge and skills.

Conclusion

The NSW state RT PDY educational program is unique in its format and has shown from the process and impact evaluations performed in 2002 and 2003 that the program is reported as beneficial by the graduate practitioners with the delivery and content considered relevant. With an impact evaluation performed on past participants, the coordinators of the program can confirm whether the initial objectives set by the NSW radiation therapy Chiefs Group are met.

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References

- 1 The Australian Institute of Radiography (2004). Educational Policies. Available online: <http://www.a-i-r.com.au/documents/EdPol.pdf>
- 2 Blanzola C, Lindeman R, King, M. Nurse Internship Pathway to Clinical Comfort, Confidence and Competency. *Journal for Nurses in Staff Development* 2004; 20 (1): 27–37.
- 3 Sterwart D. Medical Training in the UK. *Arch Dis Child* 2003; 88 (8): 655–658.
- 4 Van der Hem-Srokkroos H, Daelmans H, Van der vleuten C, Haarman H, Scherpbier A. A quality study of constructive clinical learning experiences. *Medical Teacher* 2003; 25 (2): 120–126.
- 5 Lynn T, Chudley A. Meeting the needs of future physicians: a core curriculum initiative for postgraduate medical education at a Canadian University. *Medical Education* 2001; 35 (10): 973–982.
- 6 National Health Medical Research Council (NHRMC). When does quality assurance in health care require independent ethical review? AusInfo 2003. Australia.
- 7 McNall M, Welch VE, Ruh KL, Milder CA, Soto T. The use of rapid-feedback evaluation methods to improve the retention rates of an HIV/AIDS healthcare intervention. *Evaluation and Program Planning* 2004; 27: 287–294.
- 8 Rotem A, Bandaranayake R. How to plan and conduct programme evaluation. *Medical Teacher* 1983; 5 (4): 127–131.
- 9 Knowles M. *The Modern Practice of Adult Education from Pedagogy to Andragogy*. Cambridge: Adult Education Company 1980.
- 10 Shelton M. Workplace to Workplace Training Health Educators in the use of Audiovisual Aids. Annual Meeting of Southern States Communication Association. New Orleans, LA, April 5–9 1995.
- 11 Biggs JB (ed). *Teaching for Learning: The View from Cognitive Psychology*. Hawthorn, Victoria: The Australian Council for Educational Research 1991.
- 12 Gambling T, Brown P, Hogg P. Research in our practice- a requirement not an option: discussion paper. *Radiography* 2003; 9: 71–76.
- 13 Owen J, Rogers P. *Program Evaluation Forms and Approaches* (2nd edition). Allen & Unwin: Sydney 1999.