

National Report on UK VERT Project Published

National Initiative

The National Radiotherapy Advisory Group (NRAG) suggested in their report to the UK Government in 2007¹, entitled *Radiotherapy: developing a world class service for England* that poor learning experiences in the clinical setting contributed to the high attrition rate of radiotherapy students. The Report included a recommendation to introduce Hybrid Virtual Environment skills training facilities across the 10 education providers and 51 associated radiotherapy and oncology sites providing clinical training and experience. The aim would be to improve retention by enhancing the student learning experience through provision of the opportunity to develop knowledge and skills in a 'safe' environment while limiting the impact on already stretched clinical resources.

VERT Project

The Department of Health and Cancer Action Team, as well as funding the costs associated with installation in England, funded an 18 month Project to manage implementation and initial evaluation of the impact of VERT².

The findings of the Project, which was managed by the Society and College of Radiographers, are presented in the newly published *Virtual Environment for Radiotherapy Training (VERT) Final Project Report*³.

Project Aims

The aim of the 18 month Project was to assess the potential use and impact of the VERT technology on recruitment and retention; the student learning experience; and development of students' practical skills, confidence and knowledge.

Project Scope

The VERT Project considered installations in England as the National Initiative was from the UK Government. International VERT sites were not studied.

VERT Report

The Report outlined the implementation and subsequent evaluation of VERT over the initial 18 month period of its introduction into 10 educational institutions and the associated radiotherapy and oncology departments providing clinical training and experience.

Installed Base Sites in UK up to September 2009:

Immersive VERT systems installed in educational institutions	10
Seminar VERT systems installed in radiotherapy and oncology departments	31

Report Findings

VERT facilities were used almost exclusively by pre-registration radiotherapy students although it was noted that other groups did use the facility. The majority of respondents (83%) considered that 1st year students benefitted most from VERT.

However, many centres were beginning to realise the potential of the technology for:

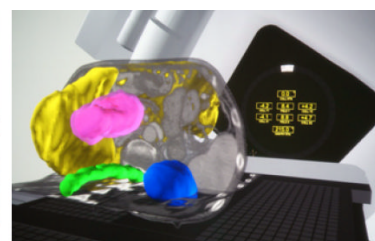
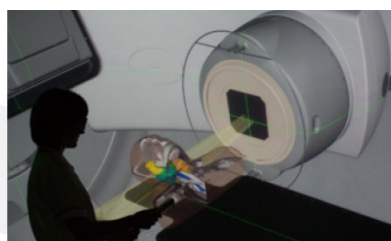
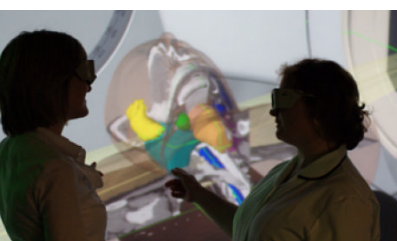
- Postgraduate students
- Those re-entering the profession
- Training new staff in local techniques
- Staff development
- Evaluation of new or unusual techniques
- Use with other staff groups

Student Experience

"Using VERT to evaluate plans ... has helped me to understand the importance of accurate contouring and what the dose distribution looks like in 3-dimensions. It has made me realise that I have to think in 3D when I'm planning."

"The anatomy sessions were brilliant and really helped to gain an in depth understanding of how organs overlapped and sat next to each other."

"Very useful for looking at the plans ... seeing where we were treating and what the dose distribution was like. Helps put the theory into practice in a safe way."



Student Perception of Student Skills and Confidence

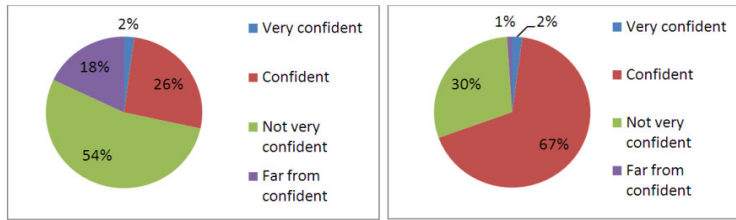


Figure 1: Confidence before VERT experience

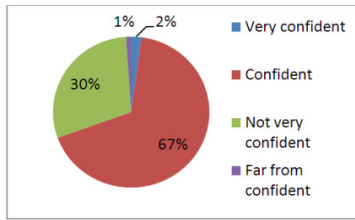


Figure 2: Confidence after VERT experience

The students' first impressions were generally very positive. There was a perception that use of VERT had a positive impact on: development of their understanding of radiotherapy concepts (82% agreed or agreed strongly); enhancement of practical skills (72% agreed or strongly agreed); and motivation (70%). It was reassuring to find that 90% of respondents agreed or strongly agreed that VERT had contributed to their enjoyment of the learning and teaching scenarios. Very few students identified problems during the early use of VERT with 81% indicating either no, or very few, problems.

88% of respondents indicated that they felt the pre-placement VERT experience was both enjoyable and had enhanced their practical skills. The remaining 12% neither agreed nor disagreed.

Staff Perception of Student Skills and Confidence

Levels of skills and confidence were perceived to be a little lower by staff than by students. 62.8% agreed that the student's initial skills and confidence were either 'better' or 'somewhat better' when compared with those of previous students without pre-placement VERT experience. 48.9% were 'confident' or 'very confident' that the student was able to operate the equipment safely and confidently following VERT experience. The view of the majority of clinical staff is captured by the following comment from one respondent:

"After repeated sessions on VERT in the department I think the skills, confidence and capability increased more rapidly than perhaps previous students."

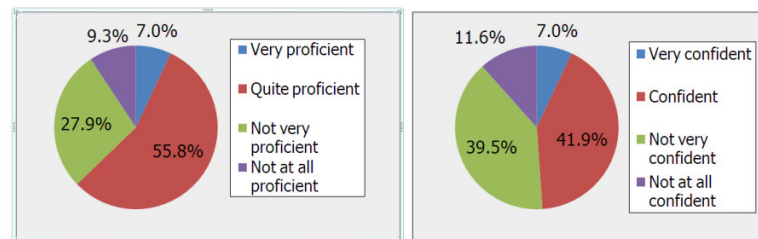


Figure 3: Staff perception of students' skills

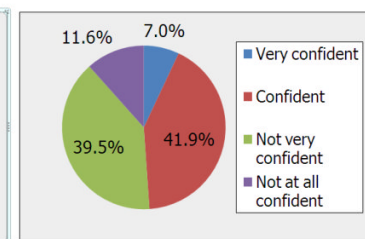


Figure 4: Staff perception of students' confidence

Follow Up

Significant advances have been made in the use of VERT, particularly Seminar VERT since the end of the data collection period in September 2009. Examples such as the anatomy training applications for VERT⁴ and initial experience with VERT⁵ are described, others are currently in development as the radiotherapy profession begins to embrace this new technology. Sharing experience is key to ensure VERT implementation fulfils its potential.

Respondents provided additional comments regarding the use of VERT and ways in which integration into radiotherapy curricula could be enhanced.

These included references to possible future technical developments such as:

- Linking treatment planning systems directly to VERT.
- Enhanced support for 3D CT anatomy teaching.
- Improved dosimetric visualisation and the effect of set up errors on dose volume histograms.

VERT software releases since the evaluation project have provided several new features in support of the above needs.

Respondents also identified specific educational uses including:

- Teaching more complex techniques.
- Using VERT for assessment.
- Incorporation into more post-registration and CPD programmes.
- Ensuring links between VERT use in the academic and clinical settings.
- Integration of VERT into multidisciplinary training within the clinical department.

Key Findings of VERT Report

This study reflects the performance of only one cohort and further evaluation is recommended but the trend is positive.

- Pre-placement VERT experience provided enhanced basic practical skills and confidence.
- Students' confidence in operating a linear accelerator using a hand-pendant was significantly improved after pre-placement VERT experience.
- Skills developed during pre-placement VERT experience, in general, transferred well to the clinical environment.
- Confidence with computer technology correlated positively with confidence in operating a linear accelerator before and after pre-placement VERT experience.
- Pre-placement VERT experience that focuses solely on learning how to operate a linear accelerator with a hand-pendant is insufficient.
- Both the students and radiographers alike identified the need for more hands-on time with VERT.

References

1. [Radiotherapy: developing a world class service for England](#), Report to Ministers from National Radiotherapy Advisory Group, 1-39, 2007 (see page 25).
2. Department of Health [The NHS Cancer Reform Strategy](#), 1-137, Dec 2007 (see page 61).
3. [Virtual Environment for Radiotherapy Training \(VERT\) Final Project Report](#), 1-58, June 2010. Also [Executive Summary](#), 1-7, June 2010.
4. How to use VERT for interactive CT anatomy for post registration training, Shah U, Williams A, Synergy Imaging and Therapy Practice, July 2010.
5. Virtual reality in radiation therapy training, Boejen A, Grau c, Surgical Oncology (2010) 1-4 (in press).