Departments of Oncology and
Medical Biophysics

Medical Physics Education and Training in the Global Village

Issues, Strategies, and Experiences

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MEDICINE & DENTISTRY

Who is involved in teaching?

- International teaching?
- Local teaching?
  - Formal teaching?
  - Radiation safety training?
  - Training on new techniques?
  - In-house continuing education?
  - Seminars?

International Courses Taught in Last Ten Years

- Home base
- IAEA courses given
- 5 IAEA courses planned
- Courses coming up
- AAPM course
- Australian TP course

Experiences

- ***Every course is different***
  - With some similarities
- Course duration usually 5 days (3 - 6 days)
- Course components
  - Lectures (~67-75%)
  - Hands on/practicals (~25-33%)
- Attendees
  - Depending on topic and/or local language
    - Medical Physicists only
    - Team: Medical Physicist & Radiation Oncologist & possibly Radiation Therapist
    - Variable experience
    - Variable technologies
    - Variable knowledge of English language
- IAEA courses – often regional courses – from different countries – diversity of backgrounds/technologies
  - Given in English
- Participants receive CD/USB drive
  - With PDF copies of PPTs
  - Resource materials

In-house meetings on education/training

Hierarchy of Student Learning in the Cognitive Domain

...form ...oherent whole

...patterns of

...cluding

...g-term learning

Very few of us have had formal training in educational theory and practice!

6 le... ...of knowledge/cognitive skills

Thomas NB Pascual M.D. M.H.P.Ed

...ing the Revised

IMPORTANT TO HAVE CLEAR LEARNING OBJECTIVES FOR ENTIRE COURSE AS WELL AS EVERY LECTURE

?

...es

certain level...

Lessons Learned

- Engagement
- ***Everyone wants more practicals***
- Course evaluations are crucial
- Student evaluations are helpful
  - As teaching & learning tool
  - As self-evaluation aid
- Lecturers tend to give too much detail in lectures
  - Students need to assimilate & apply knowledge at home
- Student mother tongue … usually not English
  - Instructors need to adapt accordingly
- Good to know students' available technologies
  - SurveyMonkey® survey

Anecdote

Observing the Teaching and Examination of the Treatment Planning Course

A report for the Principles and Practice of the University Teaching Course

Chen-Yu Huang
Postdoctoral Research Fellow
Sydney Medical School
University of Sydney

Course: Training Course on the Physics of External Photon Beam Radiation Treatment Planning

Date: 24-29 June 2013

Venue: Lecture Theatre 2, School of Physics, University of Sydney

1. Observing Prof. Jake Van Dyk Teach

I participated a five day training course on the treatment planning of external beam radiotherapy. This is primarily targeted at medical physics registrars and later extended to PhDs, postdocs and lecturers in the Medical Physics field. The total number of participants was about 50. The course

What draws attention?

Jake showed us a movie poster of the "Collateral Damage" in his PowerPoint (Figure 1). He drew an analogy between the massive destructive weapons/soldiers to the radiotherapy treatment because for radiotherapy if not used properly, it can cause huge damage to patient. I think the poster successfully arouse interests and attention of the audiences.

Figure 1 A movie poster

He asked every one of us to introduce ourselves by saying our name, from where, description of training status and projects. This method quickly grouped the whole classroom into one because we are interested in people in the same stage of career development. It provided a chance for us to know people sitting around. Besides, students will know that they are encouraged to interact

English (U.S.)

Chen-Yu Huang

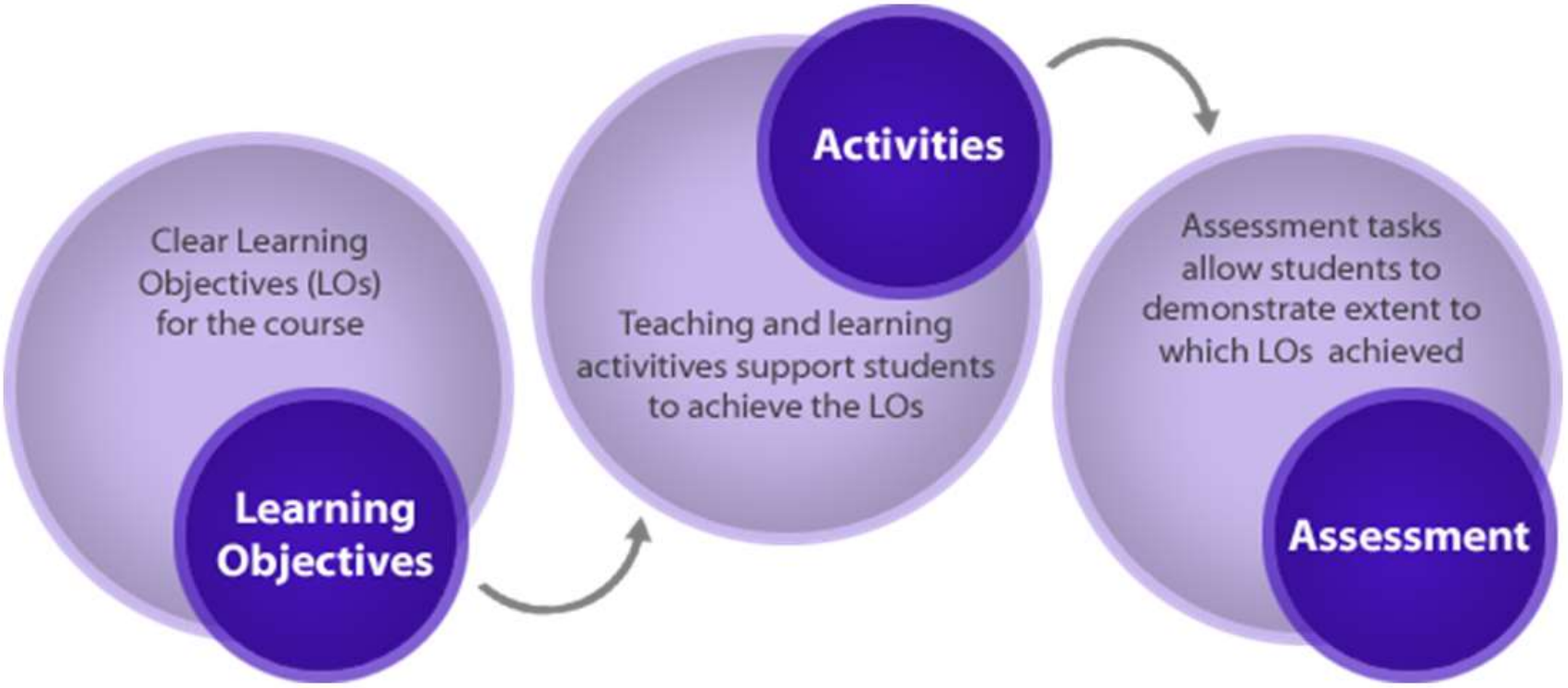


Figure 2 Constructive alignment model

"Good teachers recognise the importance of context, and adapt their teaching accordingly; they know how to modify their teaching strategies according to the particular students and subject matter, …"

Chen-Yu Huang

Key Observations

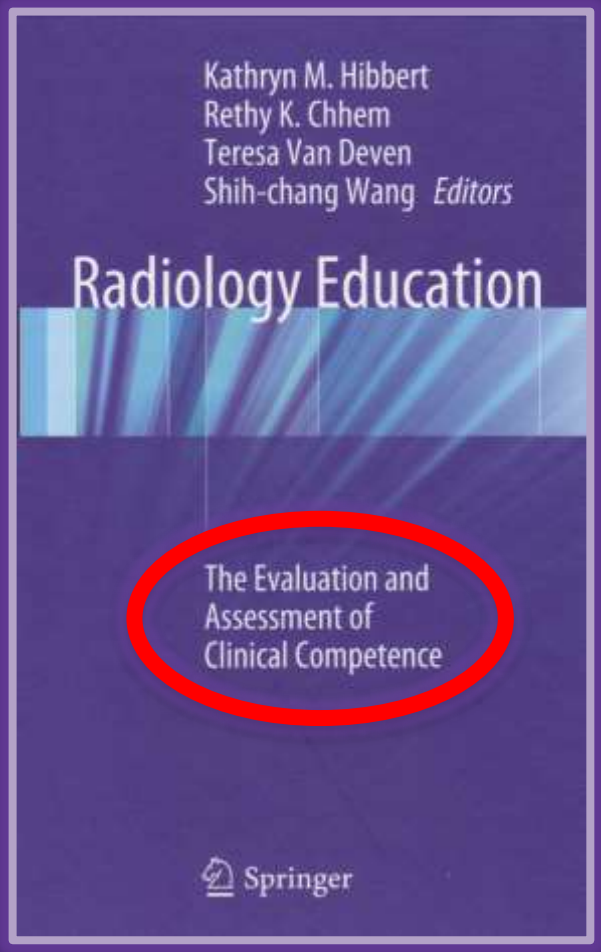
- Engage the audience
- Clear objectives
- Not too many details
- Relevant examples
- “Deep learning” assessment

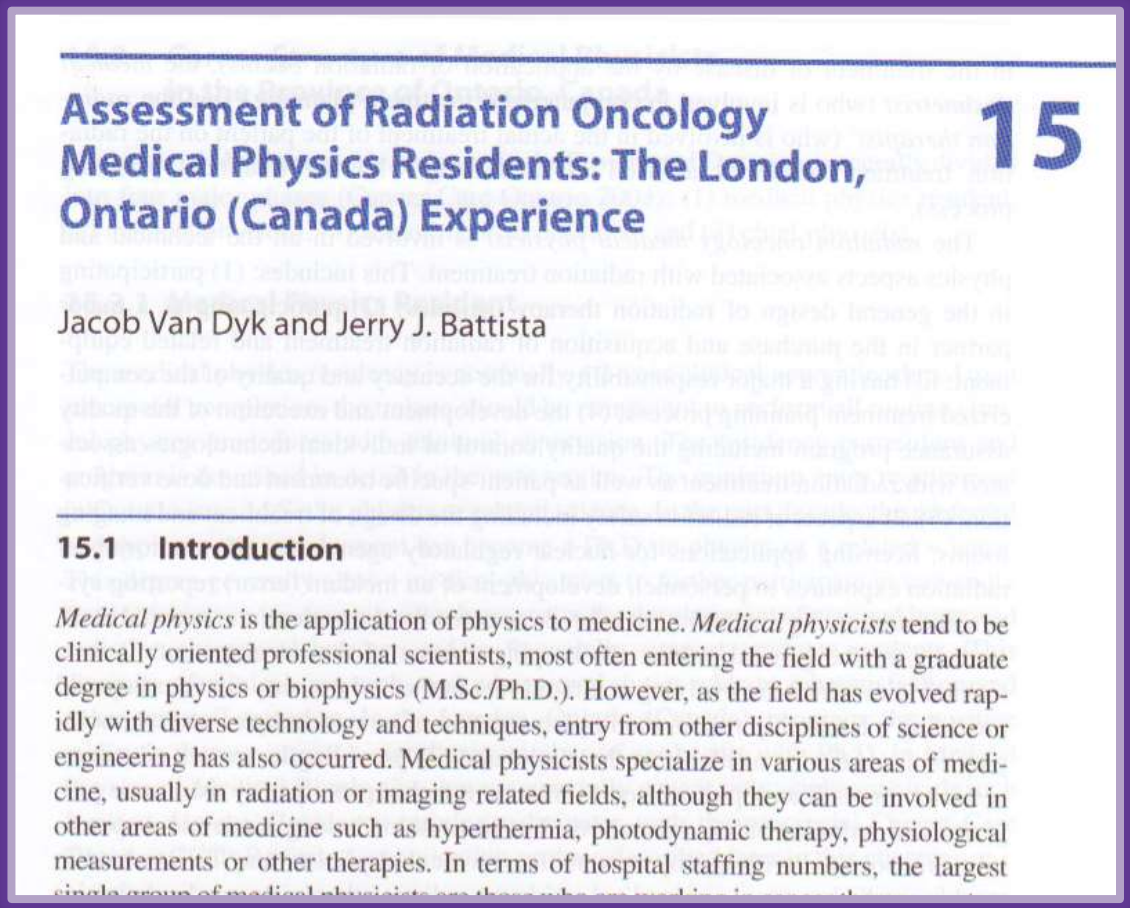
Chen-Yu Huang

Evaluation of Success of Training

- Very difficult to get objective answer
- Ideally,
  - Independent objective observer provides assessment of on-the-job competence
- Practically,
  - Such data hard to come by

Evaluation of Success of Training





Assessment of Radiation Oncology Medical Physics Residents: The London, Ontario (Canada) Experience 15

Jacob Van Dyk and Jerry J. Battista

15.1 Introduction

Medical physics is the application of physics to medicine. *Medical physicists* tend to be clinically oriented professional scientists, most often entering the field with a graduate degree in physics or biophysics (M.Sc./Ph.D.). However, as the field has evolved rapidly with diverse technology and techniques, entry from other disciplines of science or engineering has also occurred. Medical physicists specialize in various areas of medicine, usually in radiation or imaging related fields, although they can be involved in other areas of medicine such as hyperthermia, photodynamic therapy, physiological measurements or other therapies. In terms of hospital staffing numbers, the largest

- Multiple methods of assessment *during* training
- What about quality of on-the-job work?

Evaluation of Success of Training

- Survey of graduate residents
  - SurveyMonkey®
  - Residents of previous 10 years
    - 16 residents
  - 10 questions

7. How well did the residents feel that their training prepared them for working as a medical physicist in a clinical environment?

7. Looking back ... Create Chart Download

	Not very '...'								Extremely '...'	Rating Average	Response Count
How 'well' did your residency prepare you for the responsibilities of a medical physicist working in a clinical environment?	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	6.3% (1)	25.0% (4)	**37.5% (6)**	31.3% (5)	8.94	16
How 'satisfied' were you with the entire training experience?	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	6.3% (1)	6.3% (1)	**50.0% (8)**	37.5% (6)	9.19	16
How 'competent' did you feel to practice medical physics in a clinical context?	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	12.5% (2)	18.8% (3)	0.0% (0)	**56.3% (9)**	12.5% (2)	8.38	16
How 'competent' do you feel now?	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	6.3% (1)	**62.5% (10)**	31.3% (5)	9.25	16
												6
												16
												0

- Survey provided useful feedback on effectiveness of residency training program
  - Including comments on where improvements could be made

Summary/Conclusions

- Medical physicists, esp. in less developed countries, are very hungry for learning from more experienced medical physicists
- Well organized courses provide ***one*** venue for learning
- Attendees always want more hands-on/practicals
- Course evaluations by students are essential
- Assessment of attendee learning is useful & essential
  - For both teachers and students
- Coordination of international teaching remains an issue
  - Need single website with ***all*** RT-related training courses
- Follow-up assessment of "real" benefit of teaching programs remains an issue