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Benefits of Web-Lectures and Video Based Content on Radiologic Physics Education

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For many radiologists and physicists

- Clinical productivity is often a priority



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2

For many radiologists and physicists

- There are many issues requiring attention and time



In addition.. you can get asked to teach

- Residents & Fellows
- Graduate Students
- Junior Faculty
- Staff (In-Services)



Web-based lectures
can lighten the load

How we've used web-lectures to flip the class

- Rad Tech Program

- California State University Northridge collaboration with UCLA

- 40 hours of content

- Several 5-minute segments of radiologic physics lectures



Video may replay. Hit "Next" to Continue

- In-person reviews

- Ensuring accountability

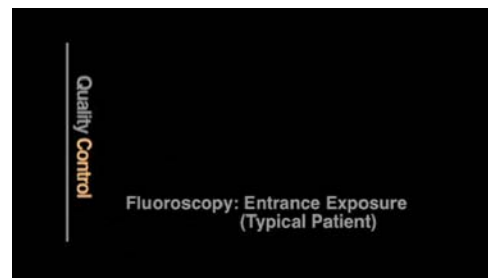


5

How we've used web-lectures to flip the class

- Created 65 Quality Control Videos

- Step-by-step tests
- Radiography
- Fluoroscopy
- Mammography
- Analog (film/screen)



Video may replay. Hit "Next" to Continue



6

Results: Class Size

- Pre Flip (in-class)
- From 2001-2004 (4 yrs)

Average Class Size

14

- Flipped Class
- From 2005-2014 (10 yrs)

Average Class Size

23

More students were accepted into the program



7

Results: 14 Years of Final Exams

- Pre Flip (in-class, 4 yr avg) Multiple Choice Questions
- Flipped Class (10 yr avg) Multiple Choice Questions

64.5%



73.7%

Short Answer Questions

Short Answer Questions

53.2%



65.8%

Improved competency with flipped classes even with larger class sizes



8

Results: National Examination (ARRT)

- Pre Flip (in-class, 4 yr avg)
- Flipped Class (10 yr avg)

National Exam
Radiologic Physics Questions

0.40

Points above the national
average (10 point scale)



National Exam
Radiologic Physics Questions

0.55

Points above the national
average (10 point scale)

Appears to have improved performance
even with larger class sizes



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9

Parts of this library has been repurposed
for different audiences

Radiologic Physics
Fundamentals

Used for:

- Undergraduate RT Program (didactic)
- ARRT Exam Prep
- Pain Management
Fluoroscopy Lectures



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10

Repurposing Video Content

Mammography Physics

Used for:

- Undergraduate RT Program (didactic)
- Medical Physics Graduate Program (didactic)
- Radiology Residents Physics Seminars
- Breast Imaging Fellows (didactic)

Repurposing Video Content

Ultrasound Physics

Used for:

- Medical Physics Graduate Program (didactic)
- Radiology Residents Physics Seminars
- Nephrology Fellows

Repurposing Video Content

CT Physics

Used for:

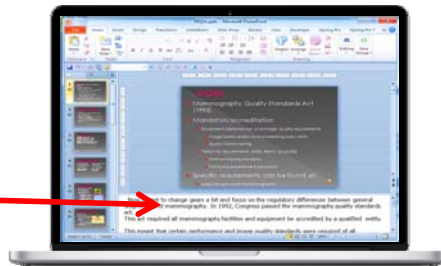
- Medical Physics Graduate Program (didactic)
- Radiology Residents Physics Seminars

If you're interested in creating video lectures

- Slide creation software

- Microsoft PowerPoint™

- Slide notes or a script can be helpful to start



You will need..

- Audio recording with
 - USB microphone

- Audacity™ software
 - Editing out pauses, 'um's
 - Saved as an audio file



Video may replay. Hit "Next" to Continue

Next

Conversion to Video

- Import audio to PowerPoint™

- Using iSpring Pro™
 - Works as a 'plug-in' within PowerPoint
 - Creates HTML5 files
 - Slide Navigation



Video may replay. Hit "Next" to Continue

Next

Student Feedback (from class evaluations)

- **Mostly positive**

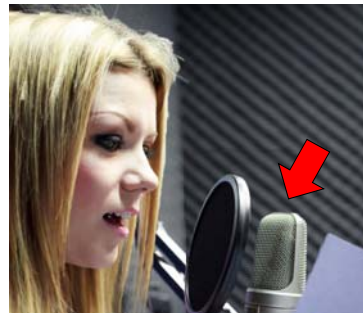
- “Lecture materials were great; clear and virtual lab/courses were often clearer and carefully thought out and planned.”
- “The lectures and explanations were well done, especially the instruction and lab on breast imaging.”
- “Virtual labs are good.”

- **Some negative**

- “I dislike the way the class is taught. Online lectures seem to not be for me. A new method must be devised”

Some Tips

- **Microphone should be placed about 6” away**
 - Richer/warmer sound



Some Tips

- Filters are used to reduce audio 'pops' with 'P' sounds



Some Tips

- Keep lectures short
(broken into 5-10 minute
segments)
- Helps maintain attention



Conclusions

- Less time for teaching with increasing clinical demands
- Flipped classrooms can improve performance and reach larger audiences
 - Potentially less instructor burn-out.
 - Ensuring student accountability is a must
- Start small – and keep videos simple and short
 - Will take longer to create
- Generally well-accepted by students
 - In-person reviews may be necessary – but overall time commitment can be reduced.



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21



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Thanks for watching!