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
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

• **In-person reviews**
  - Ensuring accountability

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
Results: Class Sizes

- 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.

Results: 14 Years of Final Exams

- Pre Flip (in-class, 4 yr avg)
  - Multiple Choice Questions: 64.5%
  - Short Answer Questions: 53.2%

- Flipped Class (10 yr avg)
  - Multiple Choice Questions: 73.7%
  - Short Answer Questions: 65.8%

Improved competency with flipped classes even with larger class sizes.
Results: National Examination (ARRT)

- Pre Flip (in-class, 4 yr avg)
  - National Exam Radiologic Physics Questions: 0.40
  - Points above the national average (10 point scale)

- Flipped Class (10 yr avg)
  - 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

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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<th>Repurposing Video Content</th>
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<td>- Undergraduate RT Program (didactic)</td>
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<td>- Medical Physics Graduate Program (didactic)</td>
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<td>- Radiology Residents Physics Seminars</td>
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<td>- Breast Imaging Fellows (didactic)</td>
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<td>- Medical Physics Graduate Program (didactic)</td>
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<td>- Radiology Residents Physics Seminars</td>
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# Repurposing Video Content

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**Here’s how we do it:**

- **Slide creation software**
  - Microsoft PowerPoint™

- Slide notes or a script can be helpful to start

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If you’re interested in creating video lectures...
You will need..

- Audio recording with
  - USB microphone

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

Conversion to Video

- Import audio to PowerPoint™

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

Thanks for watching!