University of Vermont
College of Medicine

Beyond Lecture Notes: High-End, High-Stakes Online Learning
Who we are

University of Vermont College of Medicine
- Located in Burlington, Vermont
- Founded in 1822
- Nation’s seventh oldest medical school
- One of 126 medical schools in the US

Enrollment
- 401 medical students
- 102 graduate students
- 79 post doctoral fellows
- 264 residents

Faculty
- 450 full time faculty
- 1435 part time faculty

Affiliated with Fletcher Allen Health Care (FAHC)
- a level 1 trauma center
Who we are

Vermont Integrated Curriculum (VIC)

- Transforms medical education
  - Learning defined by body system, disease, and skill set
  - Patient-based learning integrates with basic science
- Merges tradition and innovation
  - Lectures, labs, and seminars join case-based studies, collaborative small groups, and virtual learning
  - The art and science of medicine are fused with an advanced hybrid online learning system
- Assesses competencies
  - Online exams with multimedia
  - Statistical analysis
  - Competency tracking
- 11 courses over first 18 months, some with as many as 60 faculty
Why COMET?

• 60-hour student week drove traditional lecture material online
  o Faculty development time and experience limited
  o Curriculum being rebuilt
• Cumulative nature of curriculum required reusable learning objects
• Exams were to be delivered online with statistics that matched existing method – bubble sheets
• Seamless computing environment – shameless plug for our colleagues tomorrow at 11 a.m.
8:20-8:50: B teaches A

9-11:50: A in Gross Anatomy
- Arm and Cubital Fossa
- Flexor Region of Forearm

9-11:50: B in Doctoring Skills
- Musculoskeletal Exam

1:10-2: Lecture
- Mechanical Properties I (Warshaw)

2:10-3: Lecture
- Embryology: Musculoskeletal System (Waters)

4:10-5: Imaging Q&A (in Histology Lab)
For questions related to these radiology lessons:
- Introduction to Imaging
- Imaging the Spine
Development
Learning modules

What's the modality?
What are we trying to image?
What's the view?

There's tons of information in this film. First, there are the bony elements.

Identify the following bony elements:
- Sacrum
- Pedicles
- Spinous processes
- Transverse processes
- SI (Sacro-Illic) joints
- Sacral Foramina

Why do the pedicles look like white circles?

What's the big, darker (but not black) blob in the patient's left upper
What is a Slit Lamp?

A slit lamp is essentially a simple and generally underused piece of equipment. It consists of an illumination system and a binocular observation system, which when correctly aligned will result in a consistent focus of the slit and microscope.

Illumination system

Basically, a short focus projector projecting an image of the illuminated slit aperture on to the eye. This part of the system should be flexible to allow various sizes and shapes of slit beam. Usually a rheostat is incorporated and the lamp house can be rotated. Neutral density, cobalt blue and red filter are usually available, and occasionally a diffuse and
How we do it

Getting them to the table

- “Stone soup” philosophy
- Development to them may mean PowerPoint animations
- Beware of the tech savvy
- Be sensitive to training time and skill level
- Know what you can promise them
Assess current materials
- Lecture notes
- PowerPoints
- Overhead transparencies
- Slide sets
- Multimedia assets – what web sites do you recommend?
- What concepts do you draw on the board?
- What do you have on reserve in the library?
How we do it: Preparing

Know the course
- Read syllabus
- Review course evaluations from previous years
- Ask for course objectives (exam questions)

Know the topic
- What other schools do
- What your school does
What we don’t do

User-controlled content

- **Defining**
  - When will it be ready?
  - How often updated?
  - What program is it in?

- **Building**
  - HTML is rarely the answer
  - Use Word outline to create PowerPoints
  - Scan slide sets and create PowerPoint albums
  - Encourage proper use of formatting to ease conversion (headings become navigation in pdfs)

- **Content Management**
  - Revision/Version
  - PowerPoint Pack N’ Go
Determine advanced multimedia

- Key concepts
- Visual concepts
- Reusable models
- What they want
Buy versus build

- **What exists?**
  - What do other faculty have? (content management)
  - Check the library
  - Have faculty approach colleagues for licensing

- **Can you use it?**
  - Understand licensing or have a resource to answer questions
  - Know your institution’s interpretation of “fair use”
  - Become versed in copyright
Our team

- IT Director and IT department
- COMET manager
- 1 ½ multimedia developers
- Access to Medical Photography Department
  - Photographers
  - Videographer
- 1 ½ sys admins
- 1 “database guy”
- 1 technical manager
Our environment

• Systems
  o Blackboard 6.0.14
  o Concord Masterfile
  o Software Secure Secure Exam browser
  o Respondus
  o Microsoft Office: Word, PowerPoint, etc.

• Development tools
  o Macromedia: Flash, Director, Dreamweaver
  o Adobe: Photoshop, Acrobat
Exams
What else we do

• Exam Delivery
  o Summative exams using Blackboard
  o Technical and curricular proctors
  o Typical exam = 100 questions, 100 students, 3 hours, twice a month
  o Baseline laptops ensure consistent performance
  o SecureExam Browser and privacy screens help prevent cheating

• Support
  o Question pools uploaded from Word using Respondus
  o Additional item-level analysis with home-grown tool
Exam Analysis and Statistics

• Blackboard provides the cumulative statistics
• A custom developed tool extracts detailed exam information
• Excel pivot-table generated reports include:
  o Individual student performance
  o Answer key
  o Enables grade adjustment for questions determined to be statistically invalid
• SAS calculates the performance based statistics
  o Discrimination index
  o Difficulty index
  o Intra-examination reliability index
Excel Pivot Table Reports

![Excel Pivot Table](image-url)

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[Image of Excel Pivot Table]
### Item Analysis Report

**Run Date: 06MAR2004**

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<td>0</td>
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</tr>
<tr>
<td><strong>Lower 25%</strong></td>
<td>5</td>
<td>13</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Discrim.</strong></td>
<td>0.000</td>
<td>0.343</td>
<td>0.000</td>
<td>-0.043</td>
<td>-0.043</td>
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</tr>
</tbody>
</table>

**Total Invalid**
- Total: 7
- Total (%): 0.0%
- Upper 25%: 0.0%
- Lower 25%: 0.0%
- Discrim.: 0.000

#### Item 93

<table>
<thead>
<tr>
<th>Response</th>
<th>0</th>
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<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
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</thead>
<tbody>
<tr>
<td><strong>Total</strong></td>
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<td>7</td>
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<tr>
<td><strong>Total (%)</strong></td>
<td>78.0%</td>
<td>6.0%</td>
<td>8.0%</td>
<td>5.0%</td>
<td>0.0%</td>
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</tr>
<tr>
<td><strong>Upper 25%</strong></td>
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<td>0</td>
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</tr>
<tr>
<td><strong>Lower 25%</strong></td>
<td>17</td>
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<td>1</td>
<td>2</td>
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<tr>
<td><strong>Discrim.</strong></td>
<td>0.281</td>
<td>-0.130</td>
<td>0.000</td>
<td>-0.087</td>
<td>-0.087</td>
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</tbody>
</table>

**Total Invalid**
- Total: 7
- Total (%): 0.0%
- Upper 25%: 0.0%
- Lower 25%: 0.0%
- Discrim.: 0.000
Questions?
• Contact us:
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    Michael.Caputo@med.uvm.edu
    (802) 656-9658
  
  o Jill Jemison
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