Harnessing Information Technology Resources to Foster Student-Directed Learning

Katherine M. Howard, PhD
University of Nevada at Las Vegas – School of Dental Medicine

OBJECTIVES
- Foster Student-directed Learning
- Fully Utilize Information Technology Resources
- Improve Student Comprehension of Histological Structures
- Deliver Microanatomy Curriculum in Efficient and Cost-Effective Manner
- Adapt Innovative Information Technology Resource Structure to Clinical Curricula

SIGNIFICANCE
- Microanatomy Curriculum
  - Traditional: Histology laboratory with microscopes and slides
  - Improved: Virtual microscope with instructor directed laboratory sessions using expensive commercial hardware, software, and slide collections
  - Innovative: Virtual laboratory notebook for student-directed learning and identification of histological structures
- Clinical Curricula
  - Adapt IT infrastructure to enhance Treatment Planning and Diagnosis and Clinical Grand Rounds courses

OUTCOMES MEASUREMENTS

Survey Question
The shared microanatomy laboratory notebook...

<table>
<thead>
<tr>
<th>Survey Question</th>
<th>Strongly Agree N (%)</th>
<th>Agree N (%)</th>
<th>Neutral N (%)</th>
<th>Disagree N (%)</th>
<th>Strongly Disagree N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Encouraged use of the virtual microscope.</td>
<td>16 (23.9)</td>
<td>25 (37.3)</td>
<td>19 (28.4)</td>
<td>14 (21)</td>
<td>2 (3)</td>
</tr>
<tr>
<td>Increased my ability to identify tissues and cells.</td>
<td>35 (52.2)</td>
<td>23 (34.3)</td>
<td>13 (19.4)</td>
<td>5 (7.5)</td>
<td>2 (3)</td>
</tr>
<tr>
<td>Was an efficient way to work in small groups and share information.</td>
<td>27 (40.3)</td>
<td>13 (19.4)</td>
<td>8 (12)</td>
<td>6 (9)</td>
<td>3 (4.5)</td>
</tr>
<tr>
<td>Encouraged instructor participation and feedback to the student's postings to the notebook.</td>
<td>25 (37.3)</td>
<td>19 (28.4)</td>
<td>13 (19.4)</td>
<td>5 (7.5)</td>
<td>2 (3)</td>
</tr>
<tr>
<td>Improved my performance on the laboratory practical.</td>
<td>25 (37.3)</td>
<td>19 (28.4)</td>
<td>13 (19.4)</td>
<td>5 (7.5)</td>
<td>2 (3)</td>
</tr>
</tbody>
</table>

Table 1. Student Responses to survey instrument.

Assessment of the Virtual Microanatomy Notebook
- Practical exam grades
- Virtual Microscope Logins
- Virtual microscope usage data
- Nine item survey instrument

PHASE ONE: IMPLEMENTATION
- Creation of the Virtual Microanatomy Notebook
  - Microsoft Office OneNote™
  - Hosted on School of Dental Medicine SharePoint
  - Laboratory component of DEN7101 Human Structure and Function

PHASE TWO: IMPLEMENTATION
- Create Clinical Notebooks
  - Diagnosis and Treatment Planning (DEN7103)
  - Grand Rounds (DEN7443)
  - Faculty Calibration
  - Collaborators: Dr. Wendy Woodall, Dr. Rick Thiriot, Dr. Marcia Ditmyer, Dr. Katherine Howard
  - Resources: Faculty relief time to re-organize case studies, OSCE examinations and grading rubrics into shared notebook on the SDM SharePoint site

CONCLUSIONS
- Created and implemented Fall and Spring semester Histology notebooks
- Measured positive student outcomes
- Fostered student-directed learning through IT resources
- Fostered student creativity
- Efficient means of material organization
- Embed any file type, URL links etc.
- Screen capture and drawing tools
- Unlimited storage capacity/size
- Real-time collaborative tool, all users see all changes
- Cost-effective: no additional resources necessary except Microsoft Office OneNote and school hosted SharePoint server which was already available
- Demonstrated feasibility to expand IT resources to utilize notebook structure for use in clinical courses