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Ophthalmoscopy procedural DVD

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Abstract
Background or purpose: The purpose of this project is to provide optometry students with an additional means of learning the procedure of ophthalmoscopy. In addition, different learning strategies were investigated in attempt to come up with the best way to facilitate students in mastering the first year optometric procedures.

Methods: A video of the entire ophthalmoscopy sequence was put together and made available to first year students in the procedures class. The same students were given a survey to evaluate the efficacy of the video in helping them learn the procedure of ophthalmoscopy. The survey also contained general questions about strategies used to learn first year optometric procedures.

Results: The production of the DVD was successfully completed and distributed to current first year optometry students for a trial viewing before and during labs in which direct ophthalmoscopy was taught. After completion of the ophthalmoscopy section of the course, a brief survey was distributed to each student. Overall, comments and feedback were positive.

Conclusions: With further editing and resolution a final copy will be available for purchase to all incoming first year students. In the future, we would like this DVD to be available to other faculty and teaching institutions.

Degree Type
Thesis

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OPHTHALMOSCOPY
PROCEDURAL DVD

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August 2005

A thesis submitted to the faculty of the College of Optometry Pacific University
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Key Words: Ophthalmoscopy, optometric procedures, Bruckner, DVD
Acknowledgments

We would like to express our appreciation to Dr. JP Lowery for his continued support and encouragement throughout this project. He has been a great resource and educator in all areas of the thesis project. Dr. Lowery was innovative, motivational, and provided us with numerous solutions to the minor dilemmas that arose throughout the project.

In addition, Dr. Andrew Armstrong was an excellent resource. We greatly appreciate his technology expertise and his advisement with the production.

Finally, we would like to thank Philip Schoesler for his video production advice and editing skills. His direction and guidance was an asset to this project.
Introduction

Optometry students are in need of a resource other than printed notes and photographs to comprehend the procedure of ophthalmoscopy. Students have a difficult time with this particular technique due to the fact that "in instrument" views cannot be precisely observed by their instructor to ensure correct performance. The goal of this project was to facilitate the initial phases of learning by allowing the students to directly see how the procedure is correctly performed in and out of instrument.

Through our research, we have discovered that a majority of educators agree that media can be utilized in such a manner to guide students in achieving previously established educational standards more efficiently. For example, the alphabet analogy presented by Hokanson and Hooper\textsuperscript{1}, which considers; “The changes achieved through the adoption of the alphabet and by mass printing of text. Using the alphabet had a major impact on the way people organized knowledge and used their cognitive capabilities. At the cognitive level the alphabet stimulated logical and analytical processes and changed the way people thought”. Over the years writing and books have altered the way people conceptualize and gain knowledge. Through computer and media use within the educational system, this too will change an individual’s ability to organize thought processes and learn as presented by Hokanson and Hooper\textsuperscript{1}.

Methods

The entire ophthalmoscopy sequence that first year optometry students learn in their procedures class was video taped using proper procedural techniques. The sequence consisted of the Bruckner test, inspection of ocular media, anterior segment evaluation, and fundus evaluation. Each of these areas were video taped separately using a digital video camera and then edited using the editing software iMovie and Final Cut Pro. The fundus evaluation segment was constructed using a fundus photograph that was scanned into Final Cut Pro. Using the features of this editing software we were able to make the video look like the view that the student should obtain when performing an actual fundus examination. After the video was edited, a voice over method was used to describe the procedures and discuss any pertinent procedural techniques. The finished product was then made into a DVD and made available to first year students through the optometry school’s computer network.

In order to evaluate the efficacy of the video a survey was put together and distributed to the first year students in procedures class. The survey contained questions about the ease of accessing the video, the quality of the video, when they viewed the video and how helpful it was in learning the correct procedure.
Results

The first year optometry students were given sufficient time to view the DVD and were then given a brief survey to complete on the effectiveness of the DVD as a learning tool. The numerical results of the survey are summarized in Table 1.0. Of the surveys that were collected a small number of the students failed to answer all of the questions. This discrepancy is accounted for in the raw scores listed in Table 1.0.

Discussion

When asked, the majority of the students replied that the DVD was “very easy” to access, with only 14.90% of students responding that the access was “somewhat easy”. As a group we were satisfied that 0.00% of the students replied that the DVD was difficult to access. Approximately 38% of the students polled stated that the DVD “helped a lot” while 61.9% of students stated that it “helped some”. Finally, when presented with the option of purchasing a DVD of all first year optometric procedures, 87% of the students stated that they would be interested.

Carroll and Weibe\textsuperscript{2}, from North Carolina State University, completed a study comparing the use of written text versus video delivery of an educational task. In this particular study, they compared static and dynamic delivery of procedural instructions. The results showed an advantage for the dynamic delivery in both efficiency and accuracy of task completion. Their study directly correlates with the student’s responses upon viewing the ophthalmoscopy procedural DVD in completing the provided survey. The students agreed that their learning experience was enhanced through viewing the DVD. The majority of the students stated that viewing the DVD was a more efficient teaching method versus written text.

However, Carroll and Weibe\textsuperscript{2} also noted past studies that do not provide a clear advantage of dynamic presentation over static presentation. The reasoning for this contradiction is two fold; the deficiency in similarity between the two types of presentations and if the dynamic presentation is too complex or shown too fast. Carroll and Weibe\textsuperscript{2} present evidence “that the tight correspondence between the animation and the procedure performed by the individual promoted shallow processing of the procedure and limited long term retention”. If this particular finding is true, we need to take into consideration the utilization of subsequent teaching methods, as direct ophthalmoscopy is the foundation for other retinal examination techniques.

Yet, it has been found that by managing the similarities between the static and dynamic presentations of procedural instructions and dividing the instructions into appropriated segments, the benefit of dynamic presentation was shown. Finally, the authors, Carroll and Weibe\textsuperscript{2} find evidence to prove that video based learning does not degrade long term memory of the learned procedure.
In addition, Reeves\textsuperscript{3} agrees and states, “Over fifty years of educational research indicates that media and technology are effective in schools as phenomena to learn both \textit{from} and \textit{with}. Historically, the learning \textit{from} or tutorial approaches have received the most attention and funding, but the \textit{with} or cognitive tool approaches are the focus of more interest and investment than ever before”.

\textbf{Conclusion}

In optometry school the procedure of ophthalmoscopy is the student’s first attempt at learning how to evaluate a fundus. This is the foundation for other retina evaluation techniques such as high plus and binocular indirect ophthalmoscopy. Therefore, it is crucial that the student learns the proper procedural and evaluation technique from the beginning. Since instructor evaluation of the student’s performance during ophthalmoscopy is difficult, it is important that they have more guided instruction than a lecture and an “out of instrument” demonstration. The DVD showing both the “out of instrument” procedure simultaneously with the appropriate “in instrument” views proved to be great asset to optometry students in their procedures course. It provided the students with an example of the views they should be getting during ophthalmoscopy and the structures they should be evaluating when doing a basic fundus examination. The project was a success and the DVD will be utilized by future classes of Optometry students.
Table 1.0

1. Was the technology easy to access?

<table>
<thead>
<tr>
<th>Raw Score</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>difficult</td>
<td>0 0.00%</td>
</tr>
<tr>
<td>somewhat easy</td>
<td>13 14.90%</td>
</tr>
<tr>
<td>very easy</td>
<td>74 85.10%</td>
</tr>
</tbody>
</table>

2. When did you view the video?

<table>
<thead>
<tr>
<th>Time</th>
<th>Raw Score</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>prior to first lab</td>
<td>46 49.40%</td>
<td></td>
</tr>
<tr>
<td>during the first lab</td>
<td>6 6.50%</td>
<td></td>
</tr>
<tr>
<td>after the first lab</td>
<td>37 39.80%</td>
<td></td>
</tr>
<tr>
<td>I did not view the video</td>
<td>4 4.30%</td>
<td></td>
</tr>
</tbody>
</table>

3. Did you find the video helpful?

<table>
<thead>
<tr>
<th>Helpfulness</th>
<th>Raw Score</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>did not help</td>
<td>0 0.00%</td>
<td></td>
</tr>
<tr>
<td>helped some</td>
<td>52 61.90%</td>
<td></td>
</tr>
<tr>
<td>helped a lot</td>
<td>32 38.10%</td>
<td></td>
</tr>
</tbody>
</table>

4a. Size and resolution of version one

<table>
<thead>
<tr>
<th>Quality</th>
<th>Raw Score</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>inadequate</td>
<td>6 7.15%</td>
<td></td>
</tr>
<tr>
<td>fair</td>
<td>48 57.15%</td>
<td></td>
</tr>
<tr>
<td>adequate</td>
<td>30 35.70%</td>
<td></td>
</tr>
</tbody>
</table>

4b. Size and resolution of version two

<table>
<thead>
<tr>
<th>Quality</th>
<th>Raw Score</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>inadequate</td>
<td>4 4.80%</td>
<td></td>
</tr>
<tr>
<td>fair</td>
<td>31 37.30%</td>
<td></td>
</tr>
<tr>
<td>adequate</td>
<td>48 57.90%</td>
<td></td>
</tr>
</tbody>
</table>

5. how well did the following strategies help you learn Optometric Procedures

a. Read manual and/or read power point lecture slides?

<table>
<thead>
<tr>
<th>Helpfulness</th>
<th>Raw Score</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>did not help</td>
<td>3 3.40%</td>
<td></td>
</tr>
<tr>
<td>helped some</td>
<td>38 43.70%</td>
<td></td>
</tr>
<tr>
<td>helped a lot</td>
<td>46 52.90%</td>
<td></td>
</tr>
</tbody>
</table>

b. observed the procedure performed by lab instructor

<table>
<thead>
<tr>
<th>Helpfulness</th>
<th>Raw Score</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>did not help</td>
<td>3 3.40%</td>
<td></td>
</tr>
<tr>
<td>helped some</td>
<td>18 20.50%</td>
<td></td>
</tr>
<tr>
<td>helped a lot</td>
<td>67 76.10%</td>
<td></td>
</tr>
</tbody>
</table>

c. viewing the video during class or lab only

<table>
<thead>
<tr>
<th>Helpfulness</th>
<th>Raw Score</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>did not help</td>
<td>2 2.30%</td>
<td></td>
</tr>
<tr>
<td>helped some</td>
<td>56 65.80%</td>
<td></td>
</tr>
<tr>
<td>helped a lot</td>
<td>27 31.80%</td>
<td></td>
</tr>
</tbody>
</table>

d. viewing video which can be accessed anytime on your laptop

<table>
<thead>
<tr>
<th>Helpfulness</th>
<th>Raw Score</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>did not help</td>
<td>3 3.50%</td>
<td></td>
</tr>
<tr>
<td>helped some</td>
<td>32 37.70%</td>
<td></td>
</tr>
<tr>
<td>helped a lot</td>
<td>50 58.80%</td>
<td></td>
</tr>
</tbody>
</table>

6. Would you purchase a DVD of all 1st year Optometric Procedures for $10?

<table>
<thead>
<tr>
<th>Option</th>
<th>Raw Score</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>yes</td>
<td>76 87.40%</td>
<td></td>
</tr>
<tr>
<td>no</td>
<td>11 12.60%</td>
<td></td>
</tr>
</tbody>
</table>
Evaluation of Efficacy: Availability of ophthalmoscopy video (MPG) on personal laptop.

1. Was the technology easy to access (download from server and compatible with existing software or downloaded QuickTime Player)?
   1. difficult to access  2. somewhat easy  3. very easy to access

2. At what point(s) did you view the video (check all that apply)
   - Prior to the first ophthalmoscopy lab
   - During the first lab
   - After the first lab
   - I did not view the video

3. Did you find the video helpful?
   1. did not help  2. helped some  3. helped a lot

4. There were two Quicktime movies available. Were the size and resolution of version one (smaller mpg with sound) adequate?
   1. inadequate  2. fair  3. adequate
   How about version 2 (larger mpg without sound)?
   1. inadequate  2. fair  3. adequate

5. How well did the following strategies help you to learn Optometric Procedures?
   a. Read Manual and/or review Powerpoint lecture slides prior to/during lab
      1. did not help  2. helped some  3. helped a lot
   b. Observed the procedure performed by a lab instructor
      1. did not help  2. helped some  3. helped a lot
   c. Viewing video of procedure during class or lab only
      1. did not help  2. helped some  3. helped a lot
   d. Viewing video which can be accessed any time on your lap top
      1. did not help  2. helped some  3. helped a lot

6. If you could purchase a DVD of all First Year Optometric Procedures for $10, would you?
   _yes_  _no_  _if no, why not_
References

