The diagnostic kit interactive learning computer program

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Recommended Citation
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Degree Type
Thesis

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THE DIAGNOSTIC KIT INTERACTIVE LEARNING COMPUTER PROGRAM

By

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A thesis submitted to the faculty of the
College of Optometry
Pacific University
Forest Grove, Oregon
for the degree of
Doctor of Optometry
May, 1997

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Brad Kepp, B.S.

David Smith, B.S.

Suzanne Scott, O.D.
Biography of David A. Smith

David Alan Smith was born May 1, 1970 to Walt and Karen Smith. He is the eldest of six children. He graduated from Madison High School in Rexburg, Idaho where his parents currently reside. After serving a LDS mission in Adelaide, Australia 1989-1991, David attended Ricks College where he met and married Rashell Gibbons. Following graduation from Ricks College, David and Rashell moved to Forest Grove, Oregon to attend Pacific University College of Optometry 1993-1997. He enjoys sports, outdoors, traveling, scouting, and spending time with his family.

Biography of Bradley Kepp

Bradley Phillip Kepp was born July 17, 1966 to Phillip and Audrey Kepp. He is the eldest of two children. He graduated from Frazee Vergas High School in Frazee, Minnesota. After spending a couple of years discovering the world he settled in and graduated from North Dakota State University with a degree in Zoology. After finding a wife who would take him, Marcia and Brad moved to Forest Grove, Oregon to attend Pacific University College of Optometry 1993-1997. He enjoys hunting, fishing and time spent with the family. Brad and Marcia are currently looking forward to practicing optometry in the midwest.
Abstract

First year optometry students must buy equipment without knowledge of its function and use. Presently there are limited resources available that describe the function and use of the equipment. A program was written using Macromedia Director on the Macintosh computer to describe the function and use of the diagnostic kit, one of the first equipment purchases a first year student makes. The program identifies each piece of equipment, instructs the student how each is used, and describes the information obtained with each piece of equipment. The effectiveness of the program was assessed by giving a survey to first year optometry students after they had viewed the program. The 43 of 84 students responses indicated the program was clear, concise, and easy to use, but provided little help comparing brands.
Acknowledgment

We would like to thank Dr. Scott for her patience and insight while advising this thesis project. We would also like to thank Tracy Walstead for her computer assistance. Special thanks to Dr. Alan Leroy for his computer expertise and time spent on technical difficulties towards the ends of the project. As always, we thank the professors and staff at Pacific University for the knowledge that made this project possible.
Introduction

As a first year optometry student, one is required to buy many different books and a variety of equipment. Spending a large sum of money on unknown necessary resources is often unsettling for the inexperienced student. The unfamiliarity with the optometric equipment makes it difficult to compare different models and features.

The diagnostic kit is one of the first large purchases a student must make. Aside from manufacturer's literature, there is limited resources available that describe the function and components of the diagnostic kit. The goal of this thesis project was to familiarize the incoming student with basic information pertaining to the diagnostic kit. It was not the purpose of this project to compare brands or models, but to teach the student the components of the diagnostic kit and how to use the instruments in order to help each student more effectively evaluate the equipment.

Methods

A program called the Diagnostic Kit Interactive Learning Computer Program was developed using Macromedia director on Apple Macintosh computers. The program included: 1) labeled equipment photographs with both front and back views of the
retinoscope head and ophthalmoscope head, and a photograph of the
transilluminator, and handle; 2) photographs and computer
simulations of the desired views achieved with the retinoscope and
ophthalmoscope; 3) text about each piece of equipment; and 4) the
ability to interface with any portion of the program at any time. The
program was 1.15 Megabytes and fit on one 3.25 inch disk.

Diagnostic Kit Interactive Learning Computer Program was
installed on 15 Power Macintosh 7200/120 computers in the
computer lab at Pacific University College of Optometry. First year
students were requested to proceed through the interactive program
within three days of the equipment fair. The equipment was a
student sponsored event where representatives of ophthalmic
companies presented their products to the students.

The effectiveness of the program was assessed by
administering a survey to the 84 students in the first year class at
Pacific University College of Optometry following their exposure to
the program and their participation in the equipment fair. The
survey included eight statements about the program content and the
ease of its use (See Appendix A). Students were asked to rate
whether they agreed or disagreed to each statement. A five point
scale was presented with the following stipulations: 1) strongly
agree; 2) agree; 3) neutral; 4) disagree; 5) strongly disagree.
Results

Forty three of eighty four students replied to the survey. The survey results are tabulated in Table I.

Table I: Number of subjects indicating each response

<table>
<thead>
<tr>
<th>Question number</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
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<td>8</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>1.33</td>
<td>0.61</td>
</tr>
<tr>
<td>Two</td>
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<td>5</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>1.26</td>
<td>0.69</td>
</tr>
<tr>
<td>Three</td>
<td>28</td>
<td>13</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>1.40</td>
<td>0.58</td>
</tr>
<tr>
<td>Four</td>
<td>17</td>
<td>18</td>
<td>7</td>
<td>1</td>
<td>0</td>
<td>1.81</td>
<td>0.79</td>
</tr>
<tr>
<td>Five</td>
<td>11</td>
<td>20</td>
<td>9</td>
<td>3</td>
<td>0</td>
<td>2.09</td>
<td>0.87</td>
</tr>
<tr>
<td>Six</td>
<td>1</td>
<td>6</td>
<td>19</td>
<td>12</td>
<td>5</td>
<td>3.33</td>
<td>0.94</td>
</tr>
<tr>
<td>Seven</td>
<td>0</td>
<td>2</td>
<td>14</td>
<td>13</td>
<td>14</td>
<td>3.91</td>
<td>0.92</td>
</tr>
<tr>
<td>Eight</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>10</td>
<td>30</td>
<td>4.60</td>
<td>0.69</td>
</tr>
</tbody>
</table>

Statement number one: The program was easy to use. 93% of the surveyed students selected a 1 or 2, which indicates some degree of agreement and 7% were neutral. Statistically, a mean of 1.33 and a standard deviation of 0.61 were calculated.

Statement number two: This program was readily available to me. 95% of the surveyed students indicated some degree of agreement and 5% disagreed. Statistically a mean of 1.26 and a standard deviation of 0.69 were calculated.
Statement number three: The information presented is clear and understandable. 95% of the surveyed students indicated agreement and 5% were neutral. Statistically a mean of 1.40 and a standard deviation of 0.58 were calculated.

Statement number four: The interactive photo/illustrations format was helpful in learning the basic components of the diagnostic kit. 81% of the surveyed students indicated agreement, 16% were neutral, and 2% disagreed. Statistically a mean of 1.33 and a standard deviation of 0.61 were calculated.

Statement number five: This program effectively explains the basics of the diagnostic kit. 72% of the surveyed students indicated agreement, 21% were neutral, and 7% disagreed. Statistically a mean of 1.33 and a standard deviation of 0.61 were calculated.

Statement number six: This program helped me feel comfortable when evaluating the different diagnostic kits. 16% of the surveyed students indicated some degree of agreement, 44% were neutral, and 40% either disagreed or strongly disagreed. Statistically a mean of 1.33 and a standard deviation of 0.61 were calculated.

Statement number seven: This program helped me discover the differences between the kits. 4% of the surveyed students agreed, 33% were neutral, and 63% disagreed or
strongly disagreed. Statistically a mean of 1.33 and a standard deviation of 0.61 were calculated.

Statement number eight: This program could replace Dr. Scott's equipment lecture. 2% of the surveyed students agreed, 4% were neutral, and 94% disagreed or strongly disagreed. Statistically a mean of 1.33 and a standard deviation of 0.61 were calculated.
Discussion

The results of the survey revealed that the program was easily accessible, simple to use, and presented information in a clear and understandable format. Students seemed to find the photos and illustrations helpful in learning the basics of the diagnostic kit. The program did not however make the students feel comfortable evaluating the different kits. This was likely because the program did not compare the differences between the various brands, an aspect from which we purposely steered away. At the time of program design, the authors felt that a direct comparison of the different brands would form a bias for the students before they had a chance to personally evaluate the equipment. Therefore, the program was designed with the intent of giving the students the information they needed to make their own comparisons of the brands. Survey results show that the comparison of the brands may be a welcome addition to future programs.
References

Appendix A

Indicate to what degree you agree with each statement.

1. The computer program is easy to use.  
   Agree 1 2 3 4 5

2. This program was readily available to me.  
   Agree 1 2 3 4 5

3. The information presented is clear and understandable.  
   Agree 1 2 3 4 5

4. The interactive photo/illustrations format was helpful in learning the basic component of the diagnostic kit.  
   Agree 1 2 3 4 5

5. This program effectively explains the basics of the diagnostic kit.  
   Agree 1 2 3 4 5

6. This program helped me feel comfortable when evaluating the different diagnostic kits.  
   Agree 1 2 3 4 5

7. The program helped me discover the differences between kits.  
   Agree 1 2 3 4 5

8. This program could replace Dr. Scott's equipment lecture.  
   Agree 1 2 3 4 5