Computer Literacy: An Analysis of 8 Years of Pre & Posttest Results and Exit-Exam Data at Methodist University

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Methodist University (MU) is a small Liberal Arts Institution in southeastern North Carolina. The demographics of MU is very dynamic, we service students of various cultures, races, and ethnicities from around the world. The Computer Science (CSC) department has been in existence for approximately 21 years; however, it was initially part of the math department. The CSC Department has since become its own entity, with over 65 majors currently enrolled in either the CSC or CIT program.
Goal Statement

Traditional college students do not have the basic Computer Literacy skills upon entry into institutions of higher learning that are required to be successful during their college career. Students are not prepared to meet the computing skills required by professional organizations, as it pertains to their ability to use software applications that are common in most office settings. There is a misunderstanding among a large percentage of the faculty, as it pertains to Computer Literacy and Social Media literacy. The data proves that students may be social media literate; however, they are not computer literate, as it pertains to work applications. Goal 3. Of the CSC department is: “Students who complete the CSC1000 course will have the ability to function as computer literate individuals.” This goal, along with several others is assessed by the SACS committee every decade.
2018 Accreditation Process at MU

1. In accordance to: [1] CRC. Regional Accreditation and Student Learning documentation; the Southern association of Colleges and Schools (SACS), has mandated that all accredited institutions assigned to its regional charter utilize a standard procedure to assess the competency level of the courses taught in their General Education Core.

2. Methodist University completed its 5th Year Interim Report to SACS on March 12, 2015. We received 3 recommendations. The university addressed the concerns and resubmitted the report on March 30, 2016.

3. The University is not preparing for our 10-Year Reaffirmation of Accreditation Compliance Certification on September 18, 2018. The Onsite Committee will be on campus in the Spring of 2019.

4. To enhance the way we submit our data departmental annual reports, the university will use: TK20 as a data storage system to track all information for SACS.
An Analysis of the CSC1000 Computer Literacy Course

1. The Pre and Posttest Analysis of the CSC1000 Computer Literacy Course is the focus of this research.
2. This course is also one of the General Education Core classes that has been identified as a “test-out” course.
3. Students who elect to take the test-out exam can receive a “Pass” to satisfy their Gen. Ed. Requirement for this class.
4. Students who do not pass the test-out exam are required to take the CSC1000 course.
5. Students can only take this exam one time
6. Students cannot take the exam if they have taken the course before at MU.
Assessment Tool
Pre and Posttest Exam

1. The department administers a pre and posttest exam at the beginning of each semester.
2. The pretest scores do not count towards the final grade in the class; however, it is recorded and used for analysis at the end of the semester when the test is administered again as the final exam.
3. After reviewing both the pre and posttest results, the disparities identified between the two sets of data is analyzed to illustrate where students have improved since the beginning of the course.
4. The subjects covered by the pre and posttest exam are Microsoft Word, Excel and Computer Concepts; however, all four Office components are covered in the course.
Assessment Process

1. To assess the overall competency level in each subject taught in the course, the data collected is analyzed for MS Access, Excel, and Computer Concepts; however, we teach Access and PowerPoint as well.

2. The exam consist of two hands-on exams and a 50 question multiple choice test.

3. The hands-on exam includes a MS Access and Excel project. Both exams have ten graded sections that are 2.5 points each.

4. The final exam analysis for all sections is also assessed to compare course averages and differences between the sections of the CSC1000 course.
Pre and Posttest Data Analysis for Eight Years

Over the past eight years, students have scored an average of **41.37 points on the pretest exam**; however, those results have **increased** by an average of **35.23 points** by the end of the semester. This increase accounted for an average score of **76.81 points on the posttest/final exam.**

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Pretest Avg</th>
<th>Difference</th>
<th>Post-test/final Exam Avg</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008-2009</td>
<td>39.09</td>
<td>33.38</td>
<td>72.47</td>
</tr>
<tr>
<td>2009-2010</td>
<td>43.99</td>
<td>32.24</td>
<td>76.23</td>
</tr>
<tr>
<td>2010-2011</td>
<td>41.49</td>
<td>35.8</td>
<td>77.29</td>
</tr>
<tr>
<td>2011-2012</td>
<td>43.93</td>
<td>32.29</td>
<td>76.22</td>
</tr>
<tr>
<td>2012-2013</td>
<td>46.66</td>
<td>33.5</td>
<td>80.16</td>
</tr>
<tr>
<td>2013-2014</td>
<td>34.29</td>
<td>44.19</td>
<td>78.48</td>
</tr>
<tr>
<td>2014-2015</td>
<td>41.54</td>
<td>40.2</td>
<td>81.74</td>
</tr>
<tr>
<td>2015-2016</td>
<td>39.99</td>
<td>37.01</td>
<td>77.01</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>YEARS</th>
<th>PreTest Avg</th>
<th>Difference</th>
<th>Post-test/final Exam Avg</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>41.37</td>
<td>35.23</td>
<td>76.81</td>
</tr>
</tbody>
</table>
The CSC department instituted a “Testout Exam” in 2013. This exam was designed to give students an opportunity to test out of the course without taking the class. From the results of the past two years, we have tested 95 students only 65 of these students passed the exam with a grade of 70 or better. The average grade of all students tested was “57.” The passing rate of the test-out exam was 9.62%
Analysis of the “Hands-On” Exam

1. The University uses Blackboard Enterprise Edition which allows each professor to specifically analyze the number of correct responses for each question on the MS Word and Excel hands-on exam.
2. The data collected from both exams were analyzed to see where students scored high or low in specific areas of the test.
3. Each question on the exam was designed to evaluate the student’s knowledge in a particular skill for MS Word and Excel.
Example of the “Hands-On” Analysis Process

1. For example, for MS Excel question one, the student is required merged certain cells and add text in the newly merged area. If only 5% of students failed to properly complete this task, then this is not an area of concern for the upcoming year.

2. This is evident because the other 95% are knowledgeable in how to merge cells and enter text in an Excel spreadsheet. Therefore we would not commit more time in the next semester or academic year to this task.

3. This approach was also used for the Microsoft Word Hands-on exam as well.
Example of the “Hands-On” Analysis Process Continued

The data from all sections of the CSC1000 course, as it pertains to each question of the Access and Excel Hands-on Exam, can produce a strategically sound approach to how we “Close the Loop” in the upcoming academic year. The intended purpose of closing the loop is to help improve the CSC1000 method of instruction each year, and increase student learning by analysis of the data. The data from all classes are analyzed to identify how changes can be implemented across all sections of the course. The CSC Department also takes into consideration what was written in the student evaluation each semester.
Analysis of The “Computer Concepts” Data

2. The chapters covered in the course are: Digital Literacy, The Internet, Digital Safety and Security, Inside Computers and Mobile Devices, and Communications and Networks.
3. In the Pre and Posttest Exam, we included 10 questions from each chapter above. After careful analysis of the exam results from each chapter, the questions answered correctly or incorrectly identified where we need to focus more time in the upcoming semester.
Example of the “Discovering Computer” Analysis Process “Continued”

1. For example, if 75% of students enrolled in 10 sections of the CSC1000 course, missed 7 out of 10 questions in the “Digital Safety and Security” chapter, this would indicate that more time and emphasis should be dedicated to this chapter in the upcoming year.

2. This technique is used by each professor, as well as the department chair, who analyzes every sections taught during the semester.

3. This technique of identifying areas where students are not knowledgeable in specific areas of the course, has been very successful.

4. This assessment process has allowed the department to “Close the Loop” by developing a strategic plan to address those problematic areas identified in the previous year. Then make the necessary adjustments in the upcoming academic year.
1. The CSC Department prepares an annual report that illustrates the activities and course analysis information collected during the academic year.

2. From careful analysis of this information, the department identifies what specific actions can be taken to address low performance areas identified by the data.

3. This process is also very useful in preparing for the SACS routine visit every 5 and 10 years. In 2016, we submitted the 5 year review, and currently preparing for the 10 year Accreditation process.

4. This process is titled “Closing the Loop” because it is the actions taken to complete the assessment process. The process began with the pre and pretest exam process at the beginning and the end of each semester.
Closing the Loop: Assessing the Data and Making Improvements

1. This assessment and analysis process has been repeated for the past 8 years, this included meticulous record keeping of individual student scores and exam analysis.

2. The assessment strategy implemented to identify areas of concern, has been very effective in improving the course materials we use and how we facilitate the CSC1000 class.

3. *The data collection process* provides the department with specific information about each question on the exam.

4. The number of correct vs. incorrect responses for each question identified if the majority of students gained a 70% or higher level of comprehension for this part of the course material.

5. The level of comprehension deemed acceptable is set by the department each year.
Making Course Improvements and Adjustments

1. The next slide will illustrate what questions were answered at less than 70% accuracy; these questions are evaluated by the department and a decision is made to either spend more time on this subject, replace the question, or amend the question.

2. If the content is inadequate, the department will identify this part of the course for revisions during the upcoming semester.

3. From the data analysis process at the end of each academic year, the department may decide to either adjust the question or add more time and emphasis on those underperforming content areas of the course.
# Making Course Improvements and Adjustments: Drill Down!

<table>
<thead>
<tr>
<th>Question</th>
<th>Answered Correctly</th>
<th>Answered Incorrectly</th>
<th>If a question scores Less than 70% the professor places a higher emphasis when teaching that information</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 software</td>
<td>19</td>
<td>2</td>
<td>90%</td>
</tr>
<tr>
<td>2 hardware</td>
<td>15</td>
<td>6</td>
<td>71%</td>
</tr>
<tr>
<td>3 Web</td>
<td>17</td>
<td>4</td>
<td>81%</td>
</tr>
<tr>
<td>4 Social media</td>
<td>17</td>
<td>4</td>
<td>81%</td>
</tr>
<tr>
<td>5 Security</td>
<td>12</td>
<td>9</td>
<td>57%</td>
</tr>
<tr>
<td>6 Applications</td>
<td>18</td>
<td>3</td>
<td>86%</td>
</tr>
<tr>
<td>7 OS’s</td>
<td>8</td>
<td>13</td>
<td>38%</td>
</tr>
<tr>
<td>8 Programming</td>
<td>6</td>
<td>15</td>
<td>29%</td>
</tr>
<tr>
<td>9 Databases</td>
<td>5</td>
<td>16</td>
<td>24%</td>
</tr>
<tr>
<td>10 Mobile devices</td>
<td>21</td>
<td>0</td>
<td>100%</td>
</tr>
</tbody>
</table>

Excel Exam: 21 Students
Future Changes to the Assessment Process

1. The CSC Department has used this assessment tool and process for over 8 years, and we are more inclined to improve the process instead of replacing it in the future.

2. The computer and information technology used in our society is updated approximately every 3-6 month; as an institution of higher learning, the equipment and the textbooks must be reevaluated every year.

3. The evaluation process ensures that we are teaching the most relevant information available. Each year, the department attempts to identify the most relevant textbook to teach the CSC1000 course.

4. The analysis process follows a life cycle process where the assessment tools are reviewed and evaluated to see if adjustments are needed. Any changes to the assessment and analysis process will be initiated by the adoption of a different textbook or newly identified SACS accreditation requirements.
1. In anticipation of the SACS 10-year review, the Computer Science Department has been collecting data from the CSC1000 course for over 8 years. This course is one of the General Education requirements, where we offer multiple sections each semester.

2. Due to the multiple sections offered of the CSC1000 course, there was a significant amount of data collected to identify areas for improvement. After identifying those areas of concern, the department was able to improve the course each academic year by implementing changes that were identified in the assessment process.

3. The Department will continue to collect data and assess the learning experience of its students through the pre and posttest analysis process. This process will also be scrutinized and reviewed yearly by the computer science department faculty to ensure it is consistently improving the student learning experience.
Questions?