Computer Software/Hardware Assessment Report
Fall 2016

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1 INTRODUCTION

Florida SouthWestern State College's Business Department gathers a multitude of data from various courses as assessment tools in support of the Florida Department of Education Curriculum Framework. These courses included in assessment are CTS 1131 *Computer Hardware*, CTS 1133 *Computer Software*, and CTS 2334 *Microsoft Windows Server.* The assessment outcomes are intended to provide a baseline and measurement of achievement moving forward as well as investigate the strength and performance of items in the exam. The assessment plan also provides comparisons between dual Enrollment and non-dual enrollment students, online versus traditional students, and by site, where possible. Where data is sufficient, additional analyses are provided including distribution studies and longitudinal studies.

For additional detail or further analysis not provided in this report, please contact Dr. Joseph F. van Gaalen, Director of Academic Assessment, Academic Affairs (jfvangaalen@fsw.edu; x16965).

2 CTS 1131

2.1 LEARNING OBJECTIVES AND DESCRIPTIVE STATISTICS

The FSW Business faculty defined one areas of interest for evaluation in support of the state framework. The SLO and the measure of success related to CTS 1131 are:

- SLO 1 – Students will be assessed using examinations and labs. (Note that no achievement goal or outcome has been specified.)

During the fall 2016 semester, 0 individual lab scores and 9 examination scores were tallied from 1 of 1 sections of CTS 1131. No labs were recorded in the Learning Management System (LMS) of the course. Mean scores for assignments described in the SLO are shown in Table 1. Descriptive statistics for each assignment is described in Table 2. An histogram of all assignments described in the SLO is shown in Figure 1.

Measure	*Overall Mean Score*
Final Exam	**68.8**

Table 1. Student achievement level by SLO for CTS 1131. The examinations have a maximum of 100 points.

	Final Exam
Maximum score	*100*
n	9
Max	100
Min	43
Median	68
Mode	~
Mean	68.8
Standard deviation	19.89
Skewness	0.32
Kurtosis	-0.89

Table 2. Descriptive statistics for CTS 1131 common course assessments.

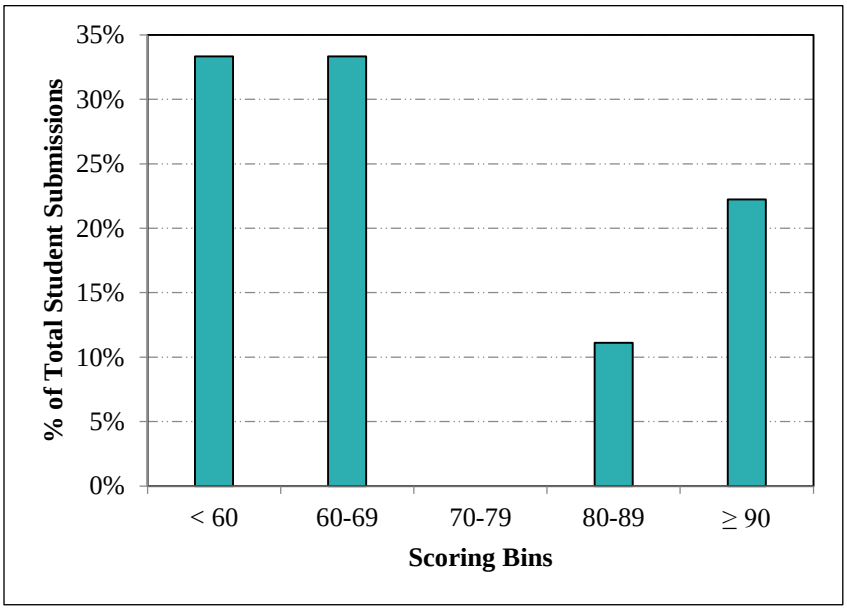

Figure 1. Score distribution for final exam (dark aqua).

2.2 Exploratory Analysis and Significance Testing

Multiple comparisons of artifact scores across varying formats, campuses, and student types were made, where possible, in order to add depth to the causes of the distribution of the artifacts. Each course was divided into the appropriate subgroups to perform the analysis. In cases where a subgroup is not represented in the course comparisons were not conducted and are noted for comprehensiveness.

2.2.1 Dual Enrollment to Non-Dual Enrollment Comparison

No dual enrollment sections of the course were run during fall 2016 so no comparison study between dual enrollment and non-dual enrollment could be completed.

2.2.2 Online to Traditional Comparison

Only one section of the course was offered during fall 2016 so no comparison study between online and traditional could be completed.

2.2.3 Comparison by Campus/Site

Only one section of the course was offered during fall 2016 so no cross-campus comparison study could be completed.

2.3 LONGITUDINAL STUDY

As further data is collected in coming terms, this section will track achievement through time and highlight strengths, weaknesses and any long term trends.

3 CTS 1133

3.1 LEARNING OBJECTIVES AND DESCRIPTIVE STATISTICS

The FSW Business faculty defined one areas of interest for evaluation in support of the state framework. The SLO and the measure of success related to CTS 1133 are:

- SLO 1 – Students will be assessed using examinations and labs. (Note that no achievement goal or outcome has been specified.)

During the fall 2016 semester, 318 individual lab scores and 40 examination scores were tallied from 2 of 2 sections of CTS 1133 across 9 recorded lab assignments and two examinations (by assignment, range of submissions is n=26 to n=40. Mean scores for assignments described in the SLO are shown in Table 3. Descriptive statistics for each assignment is described in Table 4. An histogram of all assignments described in the SLO is shown in Figure 2.

Measure	*Overall Mean Score*	*Measure*	*Overall Mean Score*
L1 Labs	**80.7**	***Midterm Exam***	**85.6**
L11 Labs	**94.1**	***Final Exam***	**64.2**
L12 Labs	**71.0**		
L13 Labs	**100.0**		
L14 Labs	**74.9**		
L15 Labs	**81.5**		
L16 Labs	**78.5**		
L17 Labs	**93.0**		
L18 Labs	**81.9**		

Table 3. Student achievement level by SLO for CTS 1133. Lab assignments have a maximum of 100 points, the examinations have a maximum of 100 points.

	All Labs	*Midterm Exam*	*Final Exam*
Maximum score	*100*	*100*	*100*
n	318	40	37
Max		99	100
Min		61	32
Median		86	61.5
Mode		84	64
Mean	79.7	85.6	64.2
Standard deviation	22.78	8.82	15.92
Skewness	-0.92	-0.89	0.33
Kurtosis	-0.06	1.07	-0.21

Table 4. Descriptive statistics for CTS 1133 common course assessments.

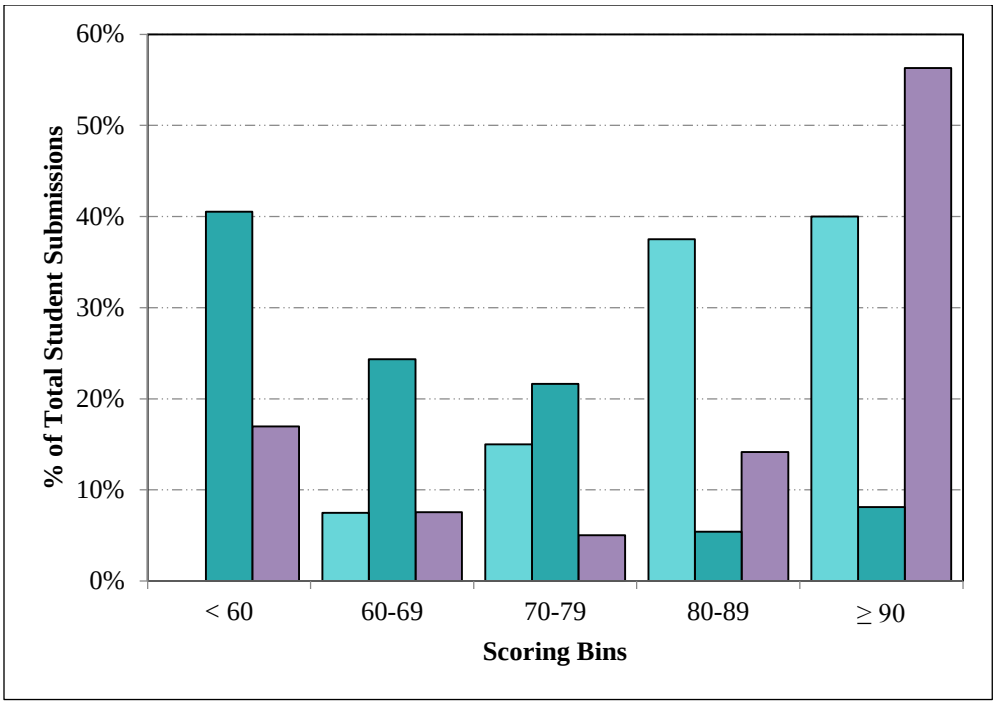

Figure 2. Score distribution for midterm exam (light aqua), final exam (dark aqua), and all lab assignments combined (purple).

3.2 Exploratory Analysis and Significance Testing

Multiple comparisons of artifact scores across varying formats, campuses, and student types were made, where possible, in order to add depth to the causes of the distribution of the artifacts. Each course was divided into the appropriate subgroups to perform the analysis. In cases where a subgroup is not represented in the course comparisons were not conducted and are noted for comprehensiveness.

3.2.1 Dual Enrollment to Non-Dual Enrollment Comparison

No dual enrollment sections of the course were run during fall 2016 so no comparison study between dual enrollment and non-dual enrollment could be completed.

3.2.2 Online to Traditional Comparison

During the fall 2016 semester, 18 total online scores were tallied from CTS 1133 and 23 traditional artifacts were tallied from CTS 1133. A comparison of basic statistics is provided in Table 5. Online artifact mean scores are higher for 9 of 11 assignments (see Figure 3). Differences in the means were tested for significance using a Welch's t-test according to standard methods (Davis, 1973; McDonald, 2009; Wilkinson, 1999). Of the 11 assignments, two were found to be statistically significantly different (L14 Lab and Midterm). Therefore, we must reject the null hypothesis that the difference in the means of the online and traditional scores of these essays is equal to 0, and we can conclude this with a 95% confidence that the differences in scores are not solely due to chance.

Assessment	L1	L11	L12	L13	L14	L15	L16	L17	L18	Midterm	Final
Maximum score	*100*	*100*	*100*	*100*	*100*	*100*	*100*	*100*	*100*	*100*	*100*
Traditional											
n	20	21	20	22	***22***	22	23	17	21	***23***	22
Mean	77.4	92.9	66.7	100	***66.4***	79.5	75.3	94.2	78.9	***81.7***	65.4
% above 80	55%	71%	*35%*	*100%*	***45%***	64%	61%	82%	67%	***61%***	9%
Online											
n	6	13	18	13	***16***	16	16	16	16	***17***	15
Mean	91.7	96.2	75.9	100	***86.6***	84.3	83.2	91.7	95.9	***90.9***	62.5
% above 80	83%	85%	56%	100%	***81%***	81%	81%	81%	75%	***100%***	20%

Table 5. Comparison of basic statistics for essays of traditional sections and online sections. Statistically significant results denoted in bold/italics.

Effect size was calculated using a method devised by Rosenthal and Rosnow (1991) for meta-analytical purposes in potential comparisons with other institutions (Lipsey and Wilson, 1993). The statistically significant results exhibit what Cohen (1988) would consider small-to-large effect sizes. In other words, non-overlap score distribution from online artifacts to traditional artifacts is approximately 13% to 66%.

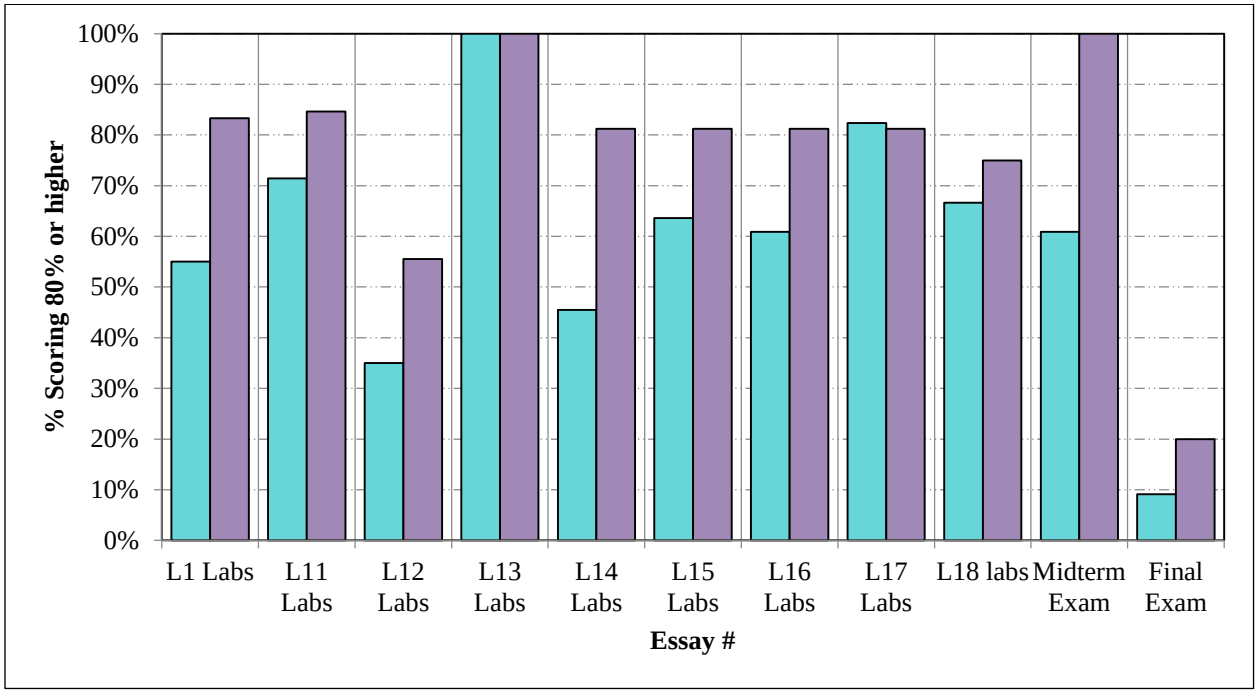

Figure 3. Comparison of percent of scores achieving 80% or higher by modality with Traditional (teal) and Online (purple).

3.2.3 Comparison by Campus/Site

Since the only two sites in which courses were offered was Thomas Edison (Lee) and FSW Online, results of this comparison are exhibited in 3.2.2 (see above).

3.3 Longitudinal Study

As further data is collected in coming terms, this section will track achievement through time and highlight strengths, weaknesses and any long term trends.

4 CTS 2334

4.1 Learning Objectives and Descriptive Statistics

The FSW Business faculty defined one areas of interest for evaluation in support of the state framework. The SLO and the measure of success related to CTS 2334 are:

- SLO 1 – Students are assessed on ability to configure both IPv4 and IPv6 network addressing on Windows computers and troubleshoot network issues using labs and examinations. (Note that no achievement goal has yet been specified.)

During the fall 2016 semester, 339 individual scores were tallied from 1 of 1 sections of CTS 2234 across 19 lab assignments and a midterm exam (by assignment, range of submissions is n=12 to n=20. Mean scores for assignments described in the SLO are shown in Table 6. Descriptive statistics for each assignment is described in Table 7. An histogram of all assignments described in the SLO is shown in Figure 4.

Learning Outcome	*Overall Mean Score*	*Learning Outcome*	*Overall Mean Score*
Chapter 1 Labs	**9.5**	***Chapter 11 Labs***	**7.5**
Chapter 2 Labs	**8.9**	***Chapter 12 Labs***	**5.2**
Chapter 3 Labs	**7.6**	***Chapter 13 Labs***	**87**
Chapter 4 Labs	**7.5**	***Chapter 14 Labs***	**9.8**
Chapter 5 Labs	**7.9**	***Chapter 15 Labs***	**8.6**
Chapter 6 Labs	**8.9**	***Chapter 16 Labs***	**9.5**
Chapter 7 Labs	**7.2**	***Chapter 17 Labs***	**8.5**
Chapter 8 Labs	**9.0**	***Chapter 18 Labs***	**8.5**
Chapter 9 Labs	**8.5**	***Chapter 19 Labs***	**8.7**
Chapter 10 Labs	**7.9**	***Midterm Exam***	**91.4**

Table 6. Student achievement level by SLO for CTS 2334. Lab assignments have a maximum of 10 points, the examination has a maximum of 100 points.

	All Labs	*Midterm Exam*
Maximum score	*10*	*100*
n	320	19
Max		100
Min		68.3
Median		94
Mode		99
Mean	8.3	91.4
Standard deviation	2.00	7.91
Skewness	-1.89	-1.63
Kurtosis	3.83	2.97

Table 7. Descriptive statistics for CTS 2334 common course assessments.

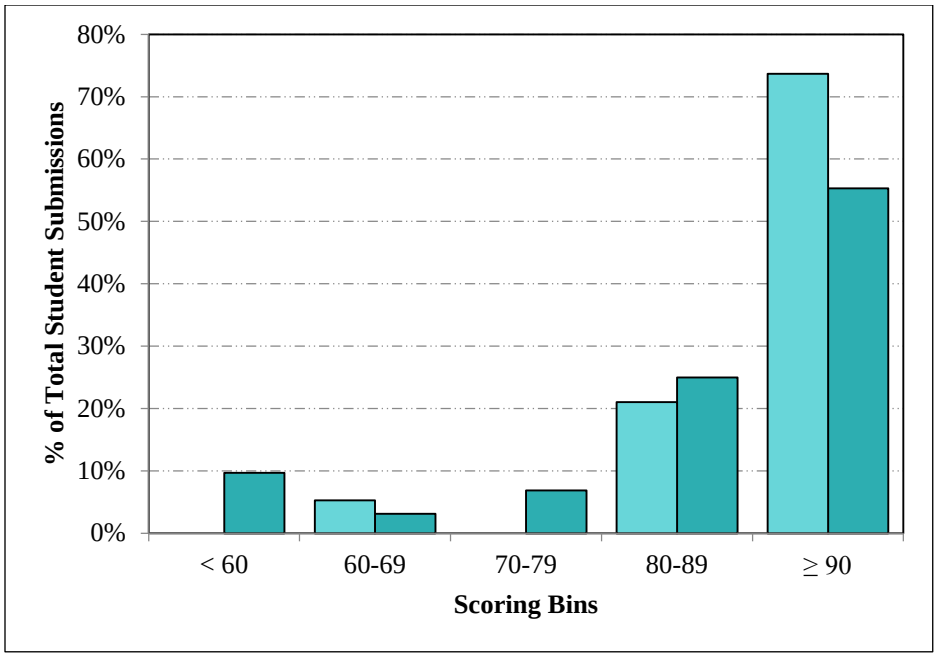

Figure 4. Score distribution for midterm exam (light aqua) and all hands on lab assignments combined (dark aqua).

4.2 Exploratory Analysis and Significance Testing

Multiple comparisons of artifact scores across varying formats, campuses, and student types were made, where possible, in order to add depth to the causes of the distribution of the artifacts. Each course was divided into the appropriate subgroups to perform the analysis. In cases where a subgroup is not represented in the course comparisons were not conducted and are noted for comprehensiveness.

4.2.1 Dual Enrollment to Non-Dual Enrollment Comparison

No dual enrollment sections of the course were run during fall 2016 so no comparison study between dual enrollment and non-dual enrollment could be completed.

4.2.2 Online to Traditional Comparison

Only one section of the course was offered during the fall 2016 semester on the Thomas Edison (Lee) campus so no comparison study could be completed.

4.2.3 Comparison by Campus/Site

Only one section of the course was offered during the fall 2016 semester on the Thomas Edison (Lee) campus so no comparison study could be completed.

4.3 Longitudinal Study

As further data is collected in coming terms, this section will track achievement through time and highlight strengths, weaknesses and any long term trends.

5 CONCLUSIONS

FSW's Business Department has employed common finals across multiple courses and in this report focused on CTS 1133 *Computer Hardware,* CTS 1133 *Computer Software,* and CTS 2334 *Microsoft Windows Server*. The results are intended to provide a baseline achievement moving forward.

5.1 CTS 1131

A drill-down of CTS 1131 results are as follows:

1. In a study of outcome, "Students will be assessed using examinations and labs. (Note that no achievement goal or outcome has been specified.)", the results exhibit 33% of artifacts for the final exam achieve a score of 80% or higher. The mean score for all final exams is 68.8/100. No labs were recorded in the Learning Management System (LMS) of the course.
2. No dual enrollment sections of the course were run during fall 2016 so no comparison study between dual enrollment and non-dual enrollment could be completed.
3. No comparison study between online and traditional courses could be completed because only one section of the course was offered during fall 2016.
4. No cross-campus comparison study could be completed because only one section of the course was offered during fall 2016.

5.2 CTS 1133

A drill-down of CTS 1133 results are as follows:

1. In a study of outcome, "Students will be assessed using examinations and labs. (Note that no achievement goal or outcome has been specified.)", the results exhibit 80% of lab assignments achieve a score of 80% or higher in 6 of 9 assignments. The mean score for all lab assignments is 79.7/100. The results for the midterm exam exhibit 78% achieve a score of 80% or higher. The mean score for all midterm exams is 85.6/100. The results for the final exam exhibit 14% achieve a score of 80% or higher. The mean score for all final exams is 64.2/100.
2. No dual enrollment sections of the course were run during fall 2016 so no comparison study between dual enrollment and non-dual enrollment could be completed.
3. In a study comparing online to traditional artifacts, online artifact mean scores are higher for 9 of 11 assignments. Of the 11 assignments, two were found to be statistically significantly different (L14 Lab and Midterm).
4. No cross-campus comparison study could be completed because the only two sites in which courses were offered was Thomas Edison (Lee) and FSW Online, results of this comparison are exhibited in #3 above.

5.3 CTS 2334

A drill-down of CTS 2334 results are as follows:

1. In a study of outcome, "Students are assessed on ability to configure both IPv4 and IPv6 network addressing on Windows computers and troubleshoot network issues using labs and examinations.", the results exhibit 80% of lab assignments achieve a score of 80% or higher. The mean score for all lab assignments is 8.3/10. The results for the midterm exam exhibit 95% achieve a score of 80% or higher. The mean score for all midterm exams is 91.4/100.
2. No dual enrollment sections of the course were run during fall 2016 so no comparison study between dual enrollment and non-dual enrollment could be completed.

3. Only one section of the course was run during the fall 2016 semester and so no comparison of online to traditional sections could be completed.
4. Only one section of the course was run during the fall 2016 semester and so no cross-campus comparison could be completed.

6 REFERENCES

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