Computer Networking Essentials Assessment Report Fall 2018

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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 CNT 1000 *Computer Networking Essentials*. 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 (concurrent) 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, Asst. Vice President of Institutional Research, Assessment & Effectiveness, Academic Affairs (jfvangaalen@fsw.edu; x16965).

2 CNT 1000

2.1 LEARNING OUTCOMES, OBJECTIVES, AND DESCRIPTIVE STATISTICS

The FSW Business faculty defined five areas of interest for evaluation in support of the state framework for the fall 2018 term. The outcomes related to CNT 1000 are:

- LO 1 - Describe LAN/WAN/MAN architectures.
- LO 2 - Explain networking standards, protocols, and the OSI model for interconnectivity including TCP/IP protocol stack, and network interconnecting hardware devices and topologies.
- LO 3 - Analyze network connectivity problems using industry standard tools and procedures.
- LO 4 - Describe the IEEE 802 standards.
- LO 5 - Compare and contrast popular internetworking data communication technologies.

During the fall 2018 semester, an enrollment of 29 contributed to scores tallied from 2 of 2 sections of CNT 1000. Descriptive statistics for achievement of outcomes are shown in Table 1. Note that the "% Meets Expectations" is the percentage of students whose average learning mastery score is equal to '3' or higher since the count (n) refers to the number of averages of learning masteries (i.e., # of students), not the number of assessments. The graphical representation of the percentage meeting expectations is shown in Figure 1. The highest "% Meets Expectations" is LO 4 at 53%. The lowest "% Meets Expectations" are LO 1 and LO 3 at 26%.

Outcomes	n	Mean	% Meets Expectations
LO 1 - Describe LAN/WAN/MAN architectures	19	2.2	26%
LO 2 - Explain networking standards, protocols, and the OSI model for interconnectivity including TCP/IP protocol stack, and network interconnecting hardware devices and topologies	19	2.5	37%
LO 3 - Analyze network connectivity problems using industry standard tools and procedures	19	2.1	26%
LO 4 - Describe the IEEE 802 standards	19	3.0	53%
LO 5 - Compare and contrast popular internetworking data communication technologies	19	2.7	37%

Table 1. Student achievement level by outcome for CNT 1000.

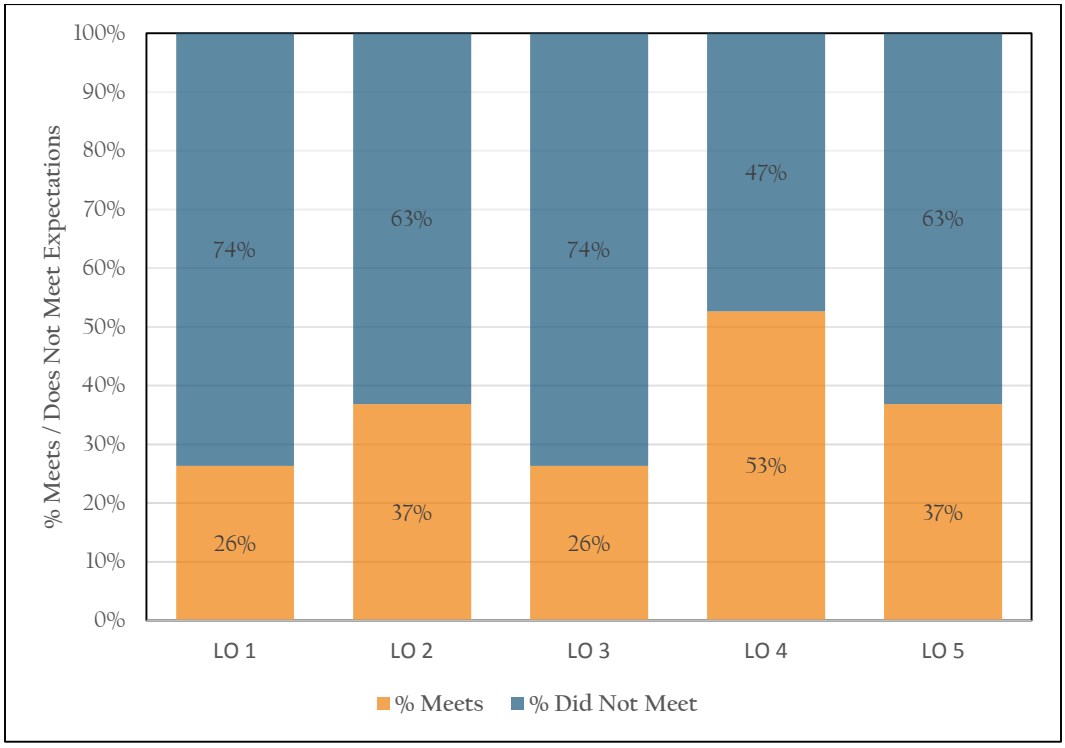

Figure 1. Bar graph of percentage of students (average learning mastery scores) meeting expectations of 3 or higher for CNT 1000.

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 (Concurrent) to Non-Dual Enrollment Comparison

No dual enrollment (concurrent) sections of the course were run during fall 2018 so no comparison study between dual enrollment and non-dual enrollment could be completed.

2.2.2 Online to Traditional Comparison

During the fall 2018 semester, one course section was offered online while the other was offered traditionally. Mean scores for traditional sections ranged from 2.4 to 3.2. Mean scores for online sections ranged from 1.6 to 2.9. The "% Meets Expectations" for traditional sections range from 27% to 55%. The "% Meets Expectations" for online sections range from 13% to 50%. Differences in the "% Meets Expectations" were tested for significance using a Fisher's Exact Test according to standard methods (McDonald, 2009; Wilkinson, 1999). No outcomes exhibit a statistically significant difference.

	Traditional			***Online***		
Outcomes	***n***	***Mean***	***% Meets Expectations***	***n***	***Mean***	***% Meets Expectations***
LO 1 - Describe LAN/WAN/MAN architectures	11	3.2	45%	8	2.0	25%
LO 2 - Explain networking standards, protocols, and the OSI model for interconnectivity including TCP/IP protocol stack, and network interconnecting hardware devices and topologies	11	3.1	55%	8	2.9	50%
LO 3 - Analyze network connectivity problems using industry standard tools and procedures	11	2.5	36%	8	1.6	13%
LO 4 - Describe the IEEE 802 standards	11	2.9	45%	8	2.1	25%
LO 5 - Compare and contrast popular internetworking data communication technologies	11	2.4	27%	8	2.0	25%

*Table 2. Comparison of basic statistics of student achievement level by Outcome for online and traditional. Statistically significant differences in the '% Meets Expectations' between online and traditional sections is in **bold/italics**.*

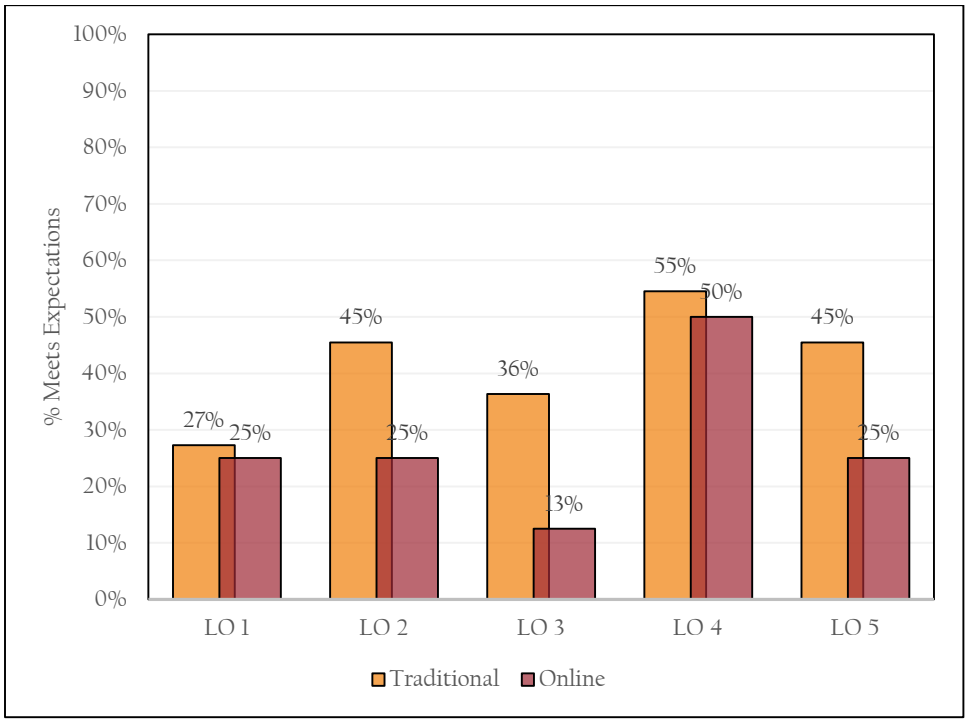

Figure 2. Comparison of '% Meets Expectations' between online and traditional sections.

2.2.3 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 2.2.2 (see above).

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 beginning fall 2019.

3 CONCLUSIONS

FSW's Business Department gathers a multitude of data from various courses as assessment tools in support of the Florida Department of Education Curriculum Framework. The courses included in assessment are CNT 1000 *Computer Networking Essentials*. The assessment outcomes are intended to provide a baseline and measurement of achievement moving forward.

3.1 CNT 1000

A drill-down of CNT 1000 results are as follows:

1. In a study of outcome achievement, "LO 1 - Describe LAN/WAN/MAN architectures." the average "% Meets Expectations" across 19 students from two course sections is 26%. Note that the "% Meets Expectations" is the percentage of students whose average learning mastery score is equal to '3' or higher since the count (n) refers to the number of averages of learning masteries (i.e., # of students), not the number of assessments.
2. In a study of outcome achievement, "LO 2 - Explain networking standards, protocols, and the OSI model for interconnectivity including TCP/IP protocol stack, and network interconnecting hardware devices and topologies." the average "% Meets Expectations" across 19 students from two course sections is 37%.
3. In a study of outcome achievement, "LO 3 - Analyze network connectivity problems using industry standard tools and procedures." the average "% Meets Expectations" across 19 students from two course sections is 26%.
4. In a study of outcome achievement, "LO 4 - Describe the IEEE 802 standards." the average "% Meets Expectations" across 19 students from two course sections is 53%.
5. In a study of outcome achievement, "LO 5 - Compare and contrast popular internetworking data communication technologies." the average "% Meets Expectations" across 19 students from two course sections is 37%.
6. In a study comparing online with traditional course sections, mean scores for traditional sections ranged from 2.4 to 3.2. Mean scores for online sections ranged from 1.6 to 2.9. The "% Meets Expectations" for traditional sections range from 27% to 55%. The "% Meets Expectations" for online sections range from 13% to 50%. No outcomes exhibit a statistically significant difference.
7. No cross-campus comparison could be completed because course data was only collected from online and one site, a study completed in #6 above.

4 REFERENCES

McDonald, J.H. 2009. Handbook of Biological Statistics (2nd ed.). Sparky House Publishing, Baltimore, Maryland.

Wilkinson, L. 1999. APA Task Force on Statistical Inference. Statistical Methods in Psychology Journals: Guidelines and Explanations. American Psychologist 54 (8), 594–604.