Office of Academic Planning and Assessment

A Report of the Course Embedded

PHIL 2306: Contemporary Moral Issues Pre- to Post-Assessment

2018-2019

Description of Introduction to Philosophy Pre- to Post-Test Assessment

Each fall and spring semester the Texas Assessment of Critical Thinking Skills (TACTS) test is administered within sections of PHIL 2306: Contemporary Moral Issues. The TACTS is a locally-developed, proprietary instrument designed to measure critical thinking, empirical, and quantitative skills. The instrument consists of 25 multiple choice questions and is administered to students enrolled in those courses at the start and end of each semester. As the instrument was developed by faculty with expertise in teaching and assessing critical thinking, it is assumed that the instrument has content related validity (Banta & Palomba, 2015). Additionally, as this test was embedded within normal sections of PHIL 2303, the student scores represent authentic student work (Banta & Palomba, 2015; Kuh et al. 2015).

The student data presented within this report reflect student performance regarding the Texas Higher Education Coordinating Board's Core Learning Objectives of Social Responsibility and Personal Responsibility (THECB, 2018). The THECB (2018) defines these concepts as follows:

- Social Responsibility – intercultural competence, knowledge of civic responsibility, and the ability to engage effectively in regional, national, and global communities
- Personal Responsibility – ability to connect choices, actions and consequences to ethical decision-making

These data should therefore be used in conjunction with other data to fully understand student knowledge and ability with regards to these Core Learning Objectives.

Methodology

A total of 514 students took the pre-test and a total 351 students took the post-test for all sections of PHIL 2306: Contemporary Moral Issues for the 2018-2019 academic year; however not all student test scores were used for analysis. In order to determine whether student performance increased from pre-to-post, a dependent samples *t*-test was used for analysis. Student SamID's were collected along with student scores in order to identify each student's score on both the pre- and post-test. A total of 311 students provided their SamID's and took both the pre- and post-tests. All statistical analysis was therefore conducted on only those students for whom both pre- and post-test scores could be identified. In order to further disaggregate the results, the data was also analyzed separately for face-to-face and online students.

Prior to conducting inferential statistics to determine whether differences were present between the students' pre- to post-test scores, checks were conducted to determine the extent to which these data were normally distributed. Three of the four standardized skewness and kurtosis coefficients were within the limits of normality of +/-3 for the face-to-face and combined populations, while all four of the coefficients were within the limits of normality for the online population (Onwuegbuzie & Daniel, 2002). Therefore, parametric dependent samples *t*-test was used for all statistical analysis. Readers are directed to Table 1 for a breakdown of these results.

Table 1
Standardized Skewness and Kurtosis Values for Student Scores Pre- and Post-test Scores

Student Population	Standardized Skewness Coefficient	Standardized Kurtosis Coefficient
Face-to-Face Students		
Pre-Test	-0.67	1.18
Post-Test	-3.58	1.79
Online Students		
Pre-Test	-0.12	0.61
Post-Test	-2.57	0.43
All Students		
Pre-Test	-0.48	1.25
Post-Test	-4.67	2.13

Results

A parametric dependent samples *t*-test revealed a statistically significant difference between the pre-to-post scores for students enrolled in face-to-face sections of PHIL 2306: Contemporary Moral Issues for the 2018-2019 academic year, $t(235) = -13.22$, $p < .001$. This difference represented a large effect size (Cohen's *d*) of 0.86 (Cohen, 1988). The average student score increased from 57.44% to 68.71%, for an increase of 11.27%. This equated to an average increase of 2.82 questions answered correctly from pre-to-post. Readers are directed to Table 2 for a breakdown of these results.

Table 2

Descriptive Statistics for Student Pre- and Post-Scores on Course-Embedded Test in PHIL 2306: Contemporary Moral Issues for 2018-2019 (Face-to-Face)

Test Version	*M*	*SD*	*M %*	*SD %*
Pre-test Scores	14.36	3.22	57.44	12.87
Post-test Scores	17.18	3.30	68.71	13.19

Note. The number of students was 236.

A parametric dependent samples *t*-test revealed a statistically significant difference between the pre-to-post scores for students enrolled in online sections of PHIL 2306: Contemporary Moral Issues for the 2018-2019 academic year, $t(74) = -4.86$, $p < .001$. This difference represented a moderate effect size (Cohen's *d*) of 0.54 (Cohen, 1988). The average student score increased from 57.44% to 68.71%, for an increase of 8.48%. This equated to an average increase of 2.12 questions answered correctly from pre-to-post. Readers are directed to Table 3 for a breakdown of these results.

Table 3

Descriptive Statistics for Student Pre- and Post-Scores on Course-Embedded Test in PHIL 2306: Contemporary Moral Issues for 2018-2019 (Online)

Test Version	M	SD	M %	SD %
Pre-test Scores	14.91	3.53	59.63	14.14
Post-test Scores	17.03	4.24	68.11	16.96

Note. The number of students was 75.

A parametric dependent samples *t*-test revealed a statistically significant difference between the pre-to-post scores for all students enrolled in sections of PHIL 2306: Contemporary Moral Issues for the 2018-2019 academic year, $t(310) = -13.706$, $p < .001$. This difference represented a moderate effect size (Cohen's *d*) of 0.77 (Cohen, 1988). The average student score increased from 57.97% to 68.57%, for an increase of 10.6%. This equated to an average increase of 2.65 questions answered correctly from pre-to-post. Readers are directed to Table 4 for a breakdown of these results.

Table 4

Descriptive Statistics for Student Pre- and Post-Scores on Course-Embedded Test in PHIL 2306: Contemporary Moral Issues for 2018-2019 (All Students)

Test Version	M	SD	M %	SD %
Pre-test Scores	14.49	3.30	57.97	13.20
Post-test Scores	17.14	3.54	68.57	14.16

Note. The number of students was 311.

Additional important information regarding student performance can also be gained through an item analysis of student pre- and post-test performance on individual test questions for each of the examined student populations. This item analysis revealed that students in face-to-face sections scored statistically significantly higher on 13 of the 25 test questions (Questions 5, 7, 8, 9, 12, 13, 14, 17, 20, 21, 23, 24, 25) from pre-to-post. Furthermore, students in face-to-face sections scored statistically significantly lower on 1 of the 25 test questions (Question 3) from pre-to-post. Readers are directed to Table 5 for a complete breakdown of item analysis data for face-to-face students.

Table 5

Percentage of Face-to-Face Students Correctly Answering Pre- and Post-Test Questions

	Pre-Test	Post-Test	Mean Difference	Cohen's *d*
Question 1	64.8%	59.3%	-5.50%	
Question 2	85.6%	90.7%	5.10%	
Question 3	58.1%	50.0%	-8.10%*	0.16
Question 4	85.2%	89.4%	4.20%	
Question 5	49.2%	61.0%	11.80%**	0.24
Question 6	78.4%	73.7%	-4.70%	

	Pre-Test	Post-Test	Mean Difference	Cohen's d
Question 7	16.5%	53.8%	37.30%***	0.85
Question 8	18.6%	44.9%	26.30%***	0.59
Question 9	36.9%	75.4%	38.50%***	0.84
Question 10	22.0%	26.3%	4.30%	
Question 11	65.3%	58.5%	-6.80%	
Question 12	25.0%	57.2%	32.20%***	0.69
Question 13	19.9%	33.9%	14.00%***	0.32
Question 14	64.8%	73.7%	8.90%*	0.19
Question 15	92.4%	94.5%	2.10%	
Question 16	43.2%	51.7%	8.50%	
Question 17	47.5%	69.1%	21.60%***	0.45
Question 18	78.0%	79.2%	1.20%	
Question 19	65.3%	70.8%	5.50%	
Question 20	76.7%	89.8%	13.10%***	0.36
Question 21	54.7%	76.7%	22.00%***	0.48
Question 22	85.2%	88.6%	3.40%	
Question 23	88.6%	94.9%	6.30%**	0.23
Question 24	41.1%	65.7%	24.60%***	0.51
Question 25	73.3%	89.0%	15.70%***	0.41

Note. n = 236. * significant at $p \leq 0.05$; ** significant at $p \leq 0.01$; *** significant at $p \leq 0.001$. Cohen's *d* from 0.2 – 0.49 indicate a small effect size, 0.50-0.79 indicate a moderate effect size, and 0.80 and higher indicate a large effect size (Cohen, 1988).

An item analysis revealed that students in online sections scored statistically significantly higher on 9 of the 25 test questions (Questions 5, 7, 8, 9, 10, 15, 16, 17, 24) from pre-to-post. Readers are directed to Table 6 for a complete breakdown of item analysis data for online students.

Table 6

Percentage of Online Students Correctly Answering Pre- and Post-Test Questions

	Pre-Test	Post-Test	Mean Difference	Cohen's d
Question 1	57.3%	61.3%	4.00%	
Question 2	90.7%	94.7%	4.00%	
Question 3	58.7%	53.3%	-5.40%	
Question 4	93.3%	86.7%	-6.60%	
Question 5	57.3%	88.0%	30.70%***	0.73
Question 6	77.3%	81.3%	4.00%	
Question 7	29.3%	57.3%	28.00%***	0.58
Question 8	20.0%	34.7%	14.70%*	0.33
Question 9	46.7%	65.3%	18.60%**	0.38
Question 10	16.0%	29.3%	13.30%*	0.32
Question 11	58.7%	46.7%	-12.00%	
Question 12	45.3%	58.7%	13.40%	

Question 13	37.3%	48.0%	10.70%	
Question 14	69.3%	69.3%	0.00%	
Question 15	89.3%	97.3%	8.00%*	0.32
Question 16	26.7%	60.0%	33.30%***	0.71
Question 17	46.7%	62.7%	16.00%*	0.32
Question 18	66.7%	72.0%	5.30%	
Question 19	61.3%	69.3%	8.00%	
Question 20	82.7%	77.3%	-5.40%	
Question 21	68.0%	68.0%	0.00%	
Question 22	84.0%	89.3%	5.30%	
Question 23	85.3%	86.7%	1.40%	
Question 24	44.0%	66.7%	22.70%***	0.46
Question 25	78.7%	78.7%	0.00%	

Note. $n = 75$. * significant at $p \leq 0.05$; ** significant at $p \leq 0.01$; *** significant at $p \leq 0.001$. Cohen's *d* from 0.2 – 0.49 indicate a small effect size, 0.50-0.79 indicate a moderate effect size, and 0.80 and higher indicate a large effect size (Cohen, 1988).

Finally, an item analysis revealed that all students combined scored statistically significantly higher on 16 of the 25 test questions (Questions 2, 5, 7, 8, 9, 10, 12, 13, 14, 16, 17, 20, 21, 23, 24, 25) from pre-to-post. Furthermore, all students combined scored statistically significantly lower on 2 of the 20 test questions (Questions 3, 11) from pre-to-post. Readers are directed to Table 7 for a complete breakdown of item analysis data for face-to-face students.

Table 7

Percentage of All Students Correctly Answering Pre- and Post-Test Questions

	Pre-Test	Post-Test	Mean Difference	Cohen's *d*
Question 1	63.0%	59.8%	-3.2%	
Question 2	86.8%	91.6%	4.8%*	0.14
Question 3	58.2%	50.8%	-7.4%*	0.15
Question 4	87.1%	88.7%	1.6%	
Question 5	51.1%	67.5%	16.4%***	0.34
Question 6	78.1%	75.6%	-2.5%	
Question 7	19.6%	54.7%	35.1%***	0.78
Question 8	19.0%	42.4%	23.4%***	0.52
Question 9	39.2%	73.0%	33.8%***	0.72
Question 10	20.6%	27.0%	6.4%*	0.14
Question 11	63.7%	55.6%	-8.1%*	0.16
Question 12	29.9%	57.6%	27.7%***	0.58
Question 13	24.1%	37.3%	13.2%***	0.29
Question 14	65.9%	72.7%	6.8%*	0.15
Question 15	91.6%	95.2%	3.6%	
Question 16	39.2%	53.7%	14.5%***	0.29
Question 17	47.3%	67.5%	20.2%***	0.42
Question 18	75.2%	77.5%	2.3%	

Question 19	64.3%	70.4%	6.1%	
Question 20	78.1%	86.8%	8.7%**	0.23
Question 21	57.9%	74.6%	16.7%***	0.36
Question 22	84.9%	88.7%	3.8%	
Question 23	87.8%	92.9%	5.1%*	0.17
Question 24	41.8%	65.9%	24.1%***	0.50
Question 25	74.6%	86.5%	11.9%***	0.30

Note. $n = 311$. * significant at $p \leq 0.05$; ** significant at $p \leq 0.01$; *** significant at $p \leq 0.001$. Cohen's *d* from $0.2 - 0.49$ indicate a small effect size, 0.50-0.79 indicate a moderate effect size, and 0.80 and higher indicate a large effect size (Cohen, 1988).

References

Banta, T. W., & Palomba, C. A. (2015). *Assessment essentials: Planning implementing, and improving assessment in higher education* (2nd ed.). San Francisco, CA: Jossey-Bass.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum.

Kuh, G. D., Ikenberry, S. O., Jankowski, N. A., Cain, T. R., Ewell, P. T8., Hutchings, P., Kinzie, J. (2015). *Using evidence of student learning to improve higher education*. San Francisco, CA: Jossey-Bass.

Onwuegbuzie, A. J., & Daniel, L. G. (2002). Uses and misuses of the correlation coefficient. *Research in the Schools, 9*(1)*, 73-90.