Office of Academic Planning and Assessment

A Report of the Course Embedded

Texas Assessment of Critical Thinking Skills (TACTS)

2017-2018

Description of Texas Assessment of Critical Thinking Skills (TACTS)

Each fall and spring semester the Texas Assessment of Critical Thinking Skills (TACTS) test is administered within sections of PHIL 2303: Critical Thinking. The TACTS is a locally-developed, proprietary instrument designed to measure critical thinking, empirical, and quantitative skills. The instrument consists of 20 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 Critical Thinking Skills and Empirical and Quantitative Skills (THECB, 2018). The THECB (2018) defines these concepts as follows:

- Critical Thinking Skills – creative thinking, innovation, inquiry, and analysis, evaluation, and synthesis of information
- Empirical and Quantitative Skills – manipulation and analysis of numerical data or observable facts resulting in informed conclusions

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 489 students took the pre-test and a total 393 students took the post-test for all sections of PHIL 2303: Critical Thinking for the 2017-2018 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 347 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. The standardized skewness and kurtosis coefficients were within the limits of normality of +/-3 for the face-to-face, online, and combined populations (Onwuegbuzie & Daniel, 2002). Therefore, a parametric dependent samples *t*-test was used for all statistical analysis.

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 2303: Critical Thinking for the 2017-2018 academic year, $t(320) = -8.68$, $p < .001$. This difference represented a moderate effect size (Cohen's d) of 0.64 (Cohen, 1988). The average student score increased from 33.94% to 41.65%, for an increase of 7.71%. This equated to an average increase of 1.54 questions answered correctly from pre-to-post. Readers are directed to Table 1 for a breakdown of these results. For online students, a parametric dependent samples *t*-test did not

reveal a statistically significant difference between the pre- to post-scores, $t(25) = -0.231$, $p = .819$. The average student score increased from 22.31% to 22.69%, for an increase of 0.38%. This equated to an average increase of 0.08 questions answered correctly from pre-to-post. Readers are directed to Table 2 for a breakdown of these results. Finally, for both populations combined, a parametric dependent samples *t*-test revealed a statistically significant difference between the pre- to post-scores for the 2017-2018 academic year, $t(346) = -8.55$, $p < .001$. This difference represented a moderate effect size (Cohen's *d*) of 0.58 (Cohen, 1988). The average student score increased from 33.07% to 40.23%, for an increase of 7.16%. This equated to an average increase of 1.44 questions answered correctly from pre-to-post. Readers are directed to Table 3 for a breakdown of these results.

Table 1

Descriptive Statistics for Student Pre- and Post-Scores on Course-Embedded TACTS Test in PHIL 2303: Critical Thinking for 2017-2018 (Face-to-Face)

Test Version	*M*	*SD*	*M %*	*SD %*
Pre-test Scores	6.79	2.25	33.94	11.25
Post-test Scores	8.33	2.53	41.65	12.65

Note. The number of students was 321.

Table 2

Descriptive Statistics for Student Pre- and Post-Scores on Course-Embedded TACTS Test in PHIL 2303: Critical Thinking for 2017-2018 (Online)

Test Version	*M*	*SD*	*M %*	*SD %*
Pre-test Scores	4.46	1.45	22.31	7.24
Post-test Scores	4.54	1.50	22.69	7.51

Note. The number of students was 26.

Table 3

Descriptive Statistics for Student Pre- and Post-Scores on Course-Embedded TACTS Test in PHIL 2303: Critical Thinking for 2017-2018 (Combined)

Test Version	*M*	*SD*	*M %*	*SD %*
Pre-test Scores	6.61	2.28	33.07	11.41
Post-test Scores	8.05	2.66	40.23	13.31

Note. The number of students was 347.

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. T., 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.

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