Sam Houston State University
Office of Assessment
Academic Affairs

College of Business Administration
A Report on the Teamwork Self-Reflection Instrument (TSRI)
2023-2024

The Teamwork Self-Reflection Instrument (TSRI) was developed by the Sam Houston State University (SHSU) Office of Assessment to evaluate one of the six Core Objectives outlined by the Texas Higher Education Coordinating Board (THECB), teamwork. According to the THECB (2018), teamwork is defined as "the ability to consider different points of view and to work effectively with others to support a shared purpose or goal" (p. 4).

Research Questions

The following research questions were addressed in this investigation: (a) What is the difference between overall teamwork scores for students classified as freshman/sophomore and students classified as junior/senior? (b) What is the difference between groups based on the number of teamwork experiences and the total TSRI score?

Method

Instrument

The TSRI was intentionally designed to assess students' self-perceived actions, attitudes, and behaviors in team settings. It was piloted in Fall 2016, revised, then further tested in Fall 2017 and Spring 2018. The full implementation began in Fall 2018. The TSRI is administered each academic year to approximately 500 students. Over a three-year cycle, each academic college at SHSU participates. The TSRI schedule can be viewed on the Office of Assessment's Core Curriculum Projects webpage.

Instrument Reliability

An exploratory factor analysis conducted on the first iteration of the instrument revealed the possibility of four underlying factors, each meeting the eigenvalue-greater-than-one rule (Kaiser, 1958), and three of those factors were ultimately demonstrated to be reliable using internal consistency analysis. The relative fit of questions within each factor was determined using a correlational cutoff of .3 (Lambert & Durand, 1975). Two questions did not factor into any of the three reliable factors, and overall reliability was slightly improved with their exclusion (.838 to .844), so the questions were revised.

A factor analysis conducted using data from the 2023-2024 administration, involving the College of Humanities and Social Sciences and the College of Business Administration, confirmed three underlying factors: group engagement and task management, interactions with group members, and responses to intergroup conflict. As revealed in the principal component analyses for 2021-2022 and 2022-2023 results, one question (Q9) had an r-square value less than .3, and it did not factor into any of the factors, so this question was revised for the 2023-2024 TSRI administration. The principal component analysis for 2023-2024 revealed that this question still did not contribute to any of the factors. Therefore, it will be removed from the TSRI for the 2024-2025 administration. Reliability analysis revealed that three of the factors were reliable. In general, good alpha estimates range from .7 - .9 (George & Mallery, 2003), with <.50 being unacceptable, .51-.60 being poor, .61-.70 being questionable, .71-.80 being acceptable, .81-.90 being good, and .91-.95 being excellent. Cronbach's Alpha for each factor was as follows:

Factor 1 (group engagement and task management) = .798, Factor 2 (interactions with group members) = .762, Factor 3 (responses to inter-group conflict) = .760.

Participants

For 2023-2024, 417 students from the College of Business Administration completed the TSRI. Table 1 provides a breakdown of participants by class group.

Table 1
TSRI Participants by Class Group for COBA

Class Group	*n*
Freshman/Sophomore	162
Junior/Senior	255
Total	417

Procedure

The Office of Assessment strives to elicit faculty and student participation from every department in participating colleges. Although the TSRI may be completed by students enrolled in face-to-face or online classes, face-to-face is the preferred modality as it typically yields higher participation rates.

At the beginning of the semester, the Director of Assessment emails college leadership to request their participation in the TSRI process. Upon receipt of the email, the Associate Dean responsible for assessment in his/her college then coordinates with department chairs to recruit faculty willing to designate approximately ten minutes of class time during which students are encouraged to complete the TSRI. Interested faculty then coordinate with the Office of Assessment to determine a date and time for students to complete the instrument. A Qualtrics link to the TSRI is sent to students on the arranged date and time. After all of the TSRIs have been completed, the results are exported to an Excel file and then imported into SPSS for data analysis

Results: Independent Samples t-test

This analysis addressed the following research question: What is the difference between overall teamwork scores for students classified as freshman/sophomore and students classified as junior/senior?

Results Summary

For the College of Business Administration and the Departments of Accounting, Business Administration and Entrepreneurship, Economics and International Business, and Finance and Banking, the results did not reveal a statistically significant difference in teamwork scores between class groups. For the Department of Management, Marketing, and Information Systems, the sample size was insufficient for statistical analysis.

College of Business Administration

Before calculating inferential statistics to ascertain if statistically significant differences were present in overall teamwork scores between class groups (i.e., freshman/sophomore and junior/senior students), the standardized skewness coefficients (i.e., the skewness value divided by the standard error of skewness) and the standardized kurtosis coefficients (i.e., the kurtosis value divided by the standard error of kurtosis) were calculated. Because all of the coefficient values were within the range of normality (i.e., +/-3, Onwuegbuzie & Daniel, 2002), the assumption of normality of the dependent variable for an independent samples *t*-test was met. The standardized skewness and standardized kurtosis coefficient values for COBA are presented in Table 2. Because the independent variable of student classification was dichotomous and the dependent variable of overall teamwork scores was at the ratio level, these assumptions for a parametric independent samples *t*-test were also met (Slate & Rojas-LeBouef, 2011). Therefore, a parametric independent samples *t*-test was performed to answer the research question. The results did not reveal a statistically significant difference between teamwork scores by class group, $p = .655$. The descriptive statistics for this analysis are provided in Table 3.

Table 2
Standardized Skewness Coefficients and Standardized Kurtosis Coefficients for Teamwork Scores by Class Group for COBA

Class Group	Standardized Skewness Coefficient	Standardized Kurtosis Coefficient
Freshman/Sophomore	-0.48	-1.53
Junior/Senior	-1.50	-0.16

Table 3
Descriptive Statistics for Teamwork Scores by Class Group for COBA

Class Group	*n*	*M*	*SD*
Freshman/Sophomore	162	49.59	8.15
Junior/Senior	255	50.75	7.95

Department of Accounting

Because the independent variable of student classification was dichotomous and the dependent variable of overall teamwork scores was at the ratio level, these assumptions for a parametric independent samples *t*-test were met (Slate & Rojas-LeBouef, 2011) To determine if the data were normally distributed, the standardized skewness coefficients (i.e., the skewness value divided by the standard error of skewness) and the standardized kurtosis coefficients (i.e., the kurtosis value divided by the standard error of kurtosis) were calculated. All coefficient values were within the range of normality (i.e., +/-3, Onwuegbuzie & Daniel, 2002). The coefficient values are presented in Table 4. Because all assumptions were met, a parametric independent samples *t*-test was performed. Results revealed no statistically significant difference in teamwork scores between class groups, $p = .079$. Descriptive statistics for this analysis are provided in Table 5.

Table 4
Standardized Skewness Coefficients and Standardized Kurtosis Coefficients for Teamwork Scores by Class Group for the Department of Accounting

Class Group	Standardized Skewness Coefficient	Standardized Kurtosis Coefficient
Freshman/Sophomore	-1.26	0.54
Junior/Senior	-1.26	0.12

Table 5
Descriptive Statistics for Teamwork Scores by Class Group for the Department of Accounting

Class Group	*n*	*M*	*SD*
Freshman/Sophomore	36	50.58	6.88
Junior/Senior	111	50.32	8.66

Department of Business Administration and Entrepreneurship

Before calculating inferential statistics to ascertain if statistically significant differences were present in overall teamwork scores between class groups (i.e., freshman/sophomore and junior/senior students), the standardized skewness coefficients (i.e., the skewness value divided by the standard error of skewness) and the standardized kurtosis coefficients (i.e., the kurtosis value divided by the standard error of kurtosis) were calculated. Because all of the coefficient values were within the range of normality (i.e., +/-3, Onwuegbuzie & Daniel, 2002), the assumption of normality of the dependent variable for an independent samples *t*-test was met. The standardized skewness and standardized kurtosis coefficient values are presented in Table 6. Because the independent variable of student classification was dichotomous and the dependent variable of overall teamwork scores was at the ratio level, these assumptions for a parametric independent samples *t*-test were also met (Slate & Rojas-LeBouef, 2011). Therefore, a parametric independent samples *t*-test was performed to answer the research question. Results revealed no statistically significant difference in teamwork scores between class groups, $p = .199$. Descriptive statistics for this analysis are presented in Table 7.

Table 6
Standardized Skewness Coefficients and Standardized Kurtosis Coefficients for Teamwork Scores by Class Group for the Department of Business Administration and Entrepreneurship

Class Group	Standardized Skewness Coefficient	Standardized Kurtosis Coefficient
Freshman/Sophomore	0.08	-1.56
Junior/Senior	-0.37	-0.51

Table 7
Descriptive Statistics for Teamwork Scores by Class Group for the Department of Business Administration and Entrepreneurship

Class Group	*n*	*M*	*SD*
Freshman/Sophomore	82	49.56	8.56
Junior/Senior	61	51.59	7.61

Department of Economics and International Business

Because the independent variable of student classification was dichotomous and the dependent variable of overall teamwork scores was at the ratio level, these assumptions for a parametric independent samples *t*-test were met (Slate & Rojas-LeBouef, 2011) To determine if the data were normally distributed, the standardized skewness coefficients (i.e., the skewness value divided by the standard error of skewness) and the standardized kurtosis coefficients (i.e., the kurtosis value divided by the standard error of kurtosis) were calculated. All coefficient values were within the range of normality (i.e., +/-3, Onwuegbuzie & Daniel, 2002). The coefficient values are presented in Table 8. Because all assumptions were met, a parametric independent samples *t*-test was performed. Results revealed no statistically significant difference in teamwork scores between class groups, $p = .189$. Descriptive statistics for this analysis are presented in Table 9.

Table 8

Standardized Skewness Coefficients and Standardized Kurtosis Coefficients for Teamwork Scores by Class Group for the Economics and International Business

Class Group	Standardized Skewness Coefficient	Standardized Kurtosis Coefficient
Freshman/Sophomore	-0.28	-0.51
Junior/Senior	1.21	0.10

Table 9

Descriptive Statistics for Teamwork Scores by Classification for the Department of Economics and International Business

Class Group	*n*	*M*	*SD*
Freshman/Sophomore	35	48.86	8.70
Junior/Senior	36	50.75	7.30

Department of Finance and Banking

Because the independent variable of student classification was dichotomous and the dependent variable of overall teamwork scores was at the ratio level, these assumptions for a parametric independent samples *t*-test were also met (Slate & Rojas-LeBouef, 2011) To determine if the data were normally distributed, the standardized skewness coefficients (i.e., the skewness value divided by the standard error of skewness) and the standardized kurtosis coefficients (i.e., the kurtosis value divided by the standard error of kurtosis) were calculated. All coefficient values were within the range of normality (i.e., +/-3, Onwuegbuzie & Daniel, 2002). The coefficient values are presented in Table 10. Because all assumptions were met, a parametric independent samples *t*-test was performed. Results revealed no statistically significant difference in teamwork scores between class groups, $p = .753$. Descriptive statistics for this analysis are presented in Table 11.

Table 10
Standardized Skewness Coefficients and Standardized Kurtosis Coefficients for Teamwork Scores by Class Group for the Department of Finance and Banking

Class Group	Standardized Skewness Coefficient	Standardized Kurtosis Coefficient
Freshman/Sophomore	0.24	-0.37
Junior/Senior	0.38	-1.13

Table 11
Descriptive Statistics for Teamwork Scores by Classification for the Department of Finance and Banking

Class Group	*n*	*M*	*SD*
Freshman/Sophomore	8	49.63	7.61
Junior/Senior	46	50.74	7.29

Department of Management, Marketing, and Information Systems

Because $n = 1$ for each class group, no statistical calculations were performed for the Department of Management, Marketing, and Information Systems.

Results: One-Way Analysis of Variance (ANOVA)

This analysis addressed the following research question: What is the difference between groups based on the number of teamwork experiences and the total TSRI score?

Results Summary

Results for the College of Business Administration revealed a statistically significant difference between the five groups. A pairwise comparison showed that TSRI scores were statistically significantly higher for students with ten or more teamwork experiences than students with one to three teamwork experiences. TSRI scores were also statistically significantly higher for students with seven to nine teamwork experiences than those with one to three teamwork experiences. Results were also statistically significant for the Department of Economics and International Business. However, the sample size for one of the groups was insufficient to perform pairwise comparisons. For the Departments of Accounting, Business Administration and Entrepreneurship, and Finance and Banking, the results were not statistically significant, and the sample size for the Department of Management, Marketing, and Information Systems was insufficient for statistical analysis.

College of Business Administration

Before performing inferential statistical procedures to answer the research question, the data were examined to ensure the assumptions for a parametric one-way Analysis of Variance (ANOVA) were met. Because the dependent variable (total TSRI score) was a continuous variable, and the independent variable (number of teamwork experiences) consisted of five categorical groups of independent observations, the first two assumptions were met. To

determine if the data were normally distributed, the standardized skewness coefficients and the standardized kurtosis coefficients were calculated. These calculations revealed that all coefficients were within the +/- 3 range of normality (Onwuegbuzie & Daniel, 2002); therefore, the assumption for a normal distribution for a parametric one-way ANOVA was met. Standardized skewness and kurtosis coefficients are presented in Table 12. A Levene's test was performed for the assumption regarding the homogeneity of variance. This result revealed that homogeneity of variance was present (p = .213).

Table 12
Standardized Skewness Coefficients and Standardized Kurtosis Coefficients for TSRI Scores and Number of Teamwork Experiences for COBA

Group	Standardized Skewness Coefficient	Standardized Kurtosis Coefficient
1	-0.18	-0.52
2	-0.04	-0.45
3	-0.39	-1.34
4	0.26	-0.75
5	-1.65	0.56

Regarding the extent to which differences were present in students' total teamwork scores as a function of the number of teamwork experiences, a parametric one-way ANOVA revealed a statistically significant difference $F(4,412) = 4.338$, $p = .002$, partial $n^2 = .040$. This difference represented a small effect size. An examination of Scheffe post hoc results revealed that TSRI scores were statistically significantly higher for students with ten or more teamwork experiences than students with one to three teamwork experiences. TSRI scores were also statistically significantly higher for students with seven to nine teamwork experiences than those with one to three teamwork experiences. Table 13 contains the descriptive statistics for TSRI scores and the number of teamwork experiences for the College of Business Administration.

Table 13
Descriptive Statistics for TSRI Scores and Number of Teamwork Experiences for COBA

Group	*n* of teamwork experiences	*n*	*M*	*SD*
1	0	17	50.94	9.24
2	1-3	120	48.25	8.62
3	4-6	143	50.02	7.70
4	7-9	70	52.01	6.71
5	10 or more	67	52.61	7.85

Department of Accounting

Before performing inferential statistical procedures to answer the research question, the data were examined to ensure the assumptions for a parametric one-way ANOVA were met. Because the dependent variable (total TSRI score) was a continuous variable, and the independent variable (number of teamwork experiences) consisted of five categorical groups of independent observations, the first two assumptions were met. To determine if the data were normally distributed, the standardized skewness coefficients and the standardized kurtosis coefficients

were calculated. These calculations revealed that all coefficients were within the +/- 3 range of normality (Onwuegbuzie & Daniel, 2002); therefore, the assumption for a normal distribution for a parametric one-way ANOVA was met. The standardized skewness and kurtosis coefficients are presented in Table 14. A Levene's test was performed for homogeneity of variance. This result revealed that homogeneity of variance was present (p = .668). Because all assumptions were met, a one-way parametric ANOVA procedure was performed. Results did not reveal a statistically significant difference between groups, p = .272. Descriptive statistics for this analysis are presented in Table 15.

Table 14
Standardized Skewness Coefficients and Standardized Kurtosis Coefficients for TSRI Scores and Number of Teamwork Experiences for the Department of Accounting

Group	Standardized Skewness Coefficient	Standardized Kurtosis Coefficient
1	-0.38	-0.01
2	-0.97	0.47
3	0.15	-0.57
4	0.03	-0.48
5	-1.57	0.71

Table 15
Descriptive Statistics for TSRI Scores and Number of Teamwork Experiences for the Department of Accounting

Group	*n* of teamwork experiences	*n* of students in the group	*M*	*SD*
1	0	4	55.50	6.76
2	1-3	37	48.51	9.36
3	4-6	57	49.98	7.33
4	7-9	26	52.12	7.59
5	10 or more	23	51.52	9.12

Department of Business Administration and Entrepreneurship

Before performing inferential statistical procedures to answer the research question, the data were examined to ensure the assumptions for a parametric one-way ANOVA were met. Because the dependent variable (total TSRI score) was a continuous variable and the independent variable (number of teamwork experiences) consisted of five categorical groups of independent observations, the first two assumptions were met. To determine if the data were normally distributed, the standardized skewness coefficients and the standardized kurtosis coefficients were calculated. These calculations revealed that all of the coefficients were within the +/- 3 range of normality (Onwuegbuzie & Daniel, 2002); therefore, the assumption for a normal distribution was met. The standardized skewness and kurtosis coefficients are presented in Table 16. A Levene's test was performed for the fourth assumption regarding homogeneity of variance. This result revealed that homogeneity of variance was present (p = .140). Accordingly, a parametric one-way ANOVA statistical procedure was performed. Results revealed no statistically significant difference between groups, p = .138. Descriptive statistics for this analysis are presented in Table 17.

Table 16
Standardized Skewness Coefficients and Standardized Kurtosis Coefficients for TSRI Scores and Number of Teamwork Experiences for the Department of Business Administration and Entrepreneurship

Group	Standardized Skewness Coefficient	Standardized Kurtosis Coefficient
1	0.10	-0.31
2	0.64	-1.31
3	-0.54	-0.60
4	0.05	-0.35
5	-0.35	-0.98

Table 17
Descriptive Statistics for TSRI Scores and Number of Teamwork Experiences for the Department of Business Administration and Entrepreneurship

Group	*n* of teamwork experiences	*n* of students in the group	*M*	*SD*
1	0	8	51.38	10.01
2	1-3	48	49.06	9.09
3	4-6	39	48.97	7.93
4	7-9	27	52.33	6.26
5	10 or more	21	53.43	7.39

Department of Economics and International Business

Before performing inferential statistical procedures to answer the research question, the data were examined to ensure the assumptions for a parametric one-way ANOVA were met. Because the dependent variable (total TSRI score) was a continuous variable and the independent variable (number of teamwork experiences) consisted of five categorical groups of independent observations, the first two assumptions were met. To determine if the data were normally distributed, the standardized skewness coefficients and the standardized kurtosis coefficients were calculated. These calculations revealed that eight of the ten coefficients were within the +/- 3 range of normality (Onwuegbuzie & Daniel, 2002); therefore, the assumption for a normal distribution was met. The standardized skewness and kurtosis coefficients are presented in Table 18. A Levene's test was performed for the fourth assumption regarding homogeneity of variance. This result revealed that homogeneity of variance was present ($p = .328$). Accordingly, a parametric one-way ANOVA statistical procedure was performed. Results revealed a statistically significant difference, $F(4,66) = 3.011$, $p = .024$, partial $n^2 = .154$. This difference represented a large effect size. Because $n = 0$ for Group 1, a Scheffe post hoc was not performed. Descriptive statistics for this analysis are presented in Table 19.

Table 18

Standardized Skewness Coefficients and Standardized Kurtosis Coefficients for TSRI Scores and Number of Teamwork Experiences for the Department of Economics and International Business

Group	Standardized Skewness Coefficient	Standardized Kurtosis Coefficient
1	*	*
2	-1.25	-0.11
3	-0.84	-0.71
4	-0.41	0.24
5	-0.73	0.44

Note: The *n* was too small to calculate these coefficients.

Table 19

Descriptive Statistics for TSRI Scores and Number of Teamwork Experiences for the Department of Economics and International Business

Group	*n* of teamwork experiences	*n* of students in the group	*M*	*SD*
1	0	1	-	-
2	1-3	23	46.52	7.23
3	4-6	28	52.18	8.68
4	7-9	8	51.63	6.12
5	10 or more	11	50.82	5.91

*Note: The *n* was too small to calculate this value.

Department of Finance and Banking

Before performing inferential statistical procedures to answer the research question, the data were examined to ensure the assumptions for a parametric one-way ANOVA were met. Because the dependent variable (total TSRI score) was a continuous variable and the independent variable (number of teamwork experiences) consisted of five categorical groups of independent observations, the first two assumptions were met. To determine if the data were normally distributed, the standardized skewness and kurtosis coefficients were calculated. These calculations revealed that nine of the ten coefficients were within the +/- 3 range of normality (Onwuegbuzie & Daniel, 2002); therefore, the assumption for a normal distribution of the data was met. The standardized skewness and kurtosis coefficients are presented in Table 20. A Levene's test was performed for homogeneity of variance. This result revealed that homogeneity of variance was present ($p = .995$). Because all assumptions were met, a one-way parametric ANOVA was performed The results revealed no statistically significant difference, $p = .164$. Table 21 contains the descriptive statistics for this analysis.

Table 20

Standardized Skewness Coefficients and Standardized Kurtosis Coefficients for TSRI Scores and Number of Teamwork Experiences for the Department of Finance and Banking

Group	Standardized Skewness Coefficient	Standardized Kurtosis Coefficient
1	1.22	*
2	0.76	0.22
3	0.07	-1.19
4	0.83	-0.88
5	-0.28	-0.36

*Note: The *n* was too small to calculate this coefficient.

Table 21

Descriptive Statistics for TSRI Scores and Number of Teamwork Experiences for the Department of Finance and Banking

Group	*n* of teamwork experiences	*n* of students in the group	*M*	*SD*
1	0	3	50.33	8.50
2	1-3	11	48.00	7.21
3	4-6	19	49.11	6.56
4	7-9	9	51.11	6.85
5	10 or more	12	54.92	7.69

Department of Management, Marketing, and Information Systems

Because $n = 1$ for two of the five groups and $n = 0$ for three of the five groups, no statistical calculations were performed for the Department of Management, Marketing, and Information Systems.

References

Field, A. (2009). *Discovering statistics using SPSS* (3rd ed.). Thousand Oaks, CA: Sage.

George, D., & Mallery, P. (2003). *SPSS for Windows step by step: A simple guide and reference. 11.0 update* (4th ed.). Allyn & Bacon.

Kaiser, H. F. (1958). The varimax criterion for analytic rotation in factor analysis. *Psychometrika, 23*, 187–200. https://doi.org/10.1007/BF02289233

Lambert, Z. V., & Durand, R. M. (1975). Some precautions in using canonical analysis. *Journal of Market Research, 12*(4), 468–475. https://doi.org/10.1177/002224377501200411

Slate, J.R., & Rojas-LeBouef, A. (2011). *Calculating basic statistical procedures in SPSS: A self-help and practical guide to preparing theses, dissertations, and manuscripts*. Ypsilanti, MI: NCPEA Press.

Texas Higher Education Coordinating Board. (2018). *Texas core curriculum*. https://reportcenter.highered.texas.gov/agency-publication/miscellaneous/elements-of-the-texas-core-curriculum/