College of Science and Engineering Technology
A Report on the Teamwork Self-Reflection Instrument (TSRI)
2022-2023

The Teamwork Self-Reflection Instrument (TSRI) was developed by the Sam Houston State University (SHSU) Office of Assessment to evaluate one of six Core Objectives outlined by the Texas Higher Education Coordinating Board (THECB), teamwork. The THECB (2018) defines teamwork 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 of the factors was determined using the 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 Criminal Justice and the College of Science and Engineering Technology, confirmed four underlying factors: interactions with group members, group engagement and task management, contributions to group discussions, and 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 will be revised or removed from the TSRI for the 2023-2024 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 (interactions with group members) = .753, Factor 2 (group engagement and task management) = .698, Factor 3 (contribution to group discussions) = .719, and Factor 4 (intergroup conflict) = .706

Participants

For 2022-2023, 430 students from the College of Science and Engineering Technology completed the TSRI. Table 1 provides a breakdown of participants by class group.

Table 1
TSRI Participants by Class Group for the College of Science and Engineering Technology

Class Group	*n*
Freshman/Sophomore	105
Junior/Senior	325
Total	430

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 sends an email to college leadership requesting participation in the TSRI process. Upon receipt of the email, the Associate Dean responsible for assessment in his/her college coordinates with department chairs to elicit faculty willing to designate approximately ten minutes of class time to allow students 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 to SPSS for data analysis.

Results: Independent Samples *t*-test

The following research question guided this investigation: What is the difference between overall teamwork scores for students classified as freshman/sophomore and students classified as junior/senior?

Results Summary

Results for the College of Science and Engineering Technology, the Departments of Agricultural Sciences, Biology, Environmental and Geosciences, Mathematics and Statistics, and Physics and Astronomy revealed no statistically significant difference between teamwork scores between class groups. For the Department of Computer Science, no students were classified as freshmen/sophomores, and for the Department of Chemistry, the sample size was insufficient, so statistical analyses were not performed for these departments. The Department of Engineering Technology did not participate in the TSRI during the 2022-2023 academic year.

College of Science and Engineering Technology

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 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. Results revealed no statistically significant difference between teamwork scores by class group, $p = .727$. Descriptive statistics for this analysis are presented in Table 3.

Table 2
Standardized Skewness Coefficients and Standardized Kurtosis Coefficients for Teamwork Scores by Class Group for the College of Science and Engineering Technology

Class Group	Standardized Skewness Coefficient	Standardized Kurtosis Coefficient
Freshman/Sophomore	0.15	-0.74
Junior/Senior	-0.18	-2.10

Table 3
Descriptive Statistics for Teamwork Scores by Class Group for the College of Science and Engineering Technology

Class Group	*n*	*M*	*SD*
Freshman/Sophomore	105	48.36	7.99
Junior/Senior	325	50.39	7.91

School of Agricultural Science

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 four coefficient values were within the range of normality (i.e., +/-3, Onwuegbuzie & Daniel, 2002). 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 ($p = .407$). Descriptive statistics for this analysis are presented in Table 5.

Table 4
Standardized Skewness Coefficients and Standardized Kurtosis Coefficients for Teamwork Scores by Class Group for the College of Science and Engineering Technology

Class Group	Standardized Skewness Coefficient	Standardized Kurtosis Coefficient
Freshman/Sophomore	-0.09	-0.64
Junior/Senior	-1.03	-0.29

Table 5
Descriptive Statistics for Teamwork Scores by Class Group for the School of Agricultural Science

Class Group	*n*	*M*	*SD*
Freshman/Sophomore	9	50.56	8.60
Junior/Senior	50	52.10	7.09

Department of Biological Sciences

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 four coefficient values were within the range of normality (i.e., +/-3, Onwuegbuzie & Daniel, 2002). Coefficient values are presented in Table 6. 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, $p = .110$. 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 Biological Sciences

Class Group	Standardized Skewness Coefficient	Standardized Kurtosis Coefficient
Freshman/Sophomore	0.39	-0.37
Junior/Senior	-0.83	-0.84

Table 7
Descriptive Statistics for Teamwork Scores by Class Group for the Department of Biological Sciences

Class Group	*n*	*M*	*SD*
Freshman/Sophomore	24	50.21	6.57
Junior/Senior	21	54.29	8.31

Department of Chemistry

Because the sample size for the freshman/sophomore class group was so small (n = 1), neither a parametric or a nonparametric independent samples *t*-test was performed. Descriptive statistics for the Department of Chemistry are provided in Table 8.

Table 8

Descriptive Statistics for Teamwork Scores by Class Group for the Department of Chemistry

Class Group	*n*	*M*	*SD*
Freshman/Sophomore	1	65.00	-
Junior/Senior	86	49.29	7.63

Department of Computer Science

Because no students were classified as freshmen/sophomores, an independent sample *t*-test could not be performed. Table 9 contains the descriptive statistics for the Department of Computer Science.

Table 9

Descriptive Statistics for Teamwork Scores by Class Group for the Department of Computer Science

Class Group	*n*	*M*	*SD*
Freshman/Sophomore	0	-	-
Junior/Senior	34	51.26	8.87

Department of Environmental and Geosciences

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 four coefficient values were within the range of normality (i.e., +/-3, Onwuegbuzie & Daniel, 2002). 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 = .319. 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 Environmental and Geosciences

Class Group	Standardized Skewness Coefficient	Standardized Kurtosis Coefficient
Freshman/Sophomore	-1.03	-0.69
Junior/Senior	1.08	-1.19

Table 11

Descriptive Statistics for Teamwork Scores by Class Group for the Department of Environmental and Geosciences

Class Group	*n*	*M*	*SD*
Freshman/Sophomore	9	44.67	7.35
Junior/Senior	40	49.80	9.60

Department of Mathematics and Statistics

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 four coefficient values were within the range of normality (i.e., +/-3, Onwuegbuzie & Daniel, 2002). The coefficient values are presented in Table 12. 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, $p = .155$. Descriptive statistics for this analysis are presented in Table 13.

Table 12

Standardized Skewness Coefficients and Standardized Kurtosis Coefficients for Teamwork Scores by Class Group for the Department of Mathematics and Statistics

Class Group	Standardized Skewness Coefficient	Standardized Kurtosis Coefficient
Freshman/Sophomore	0.41	-0.55
Junior/Senior	-1.18	-0.44

Table 13

Descriptive Statistics for Teamwork Scores by Class Group for the Department of Mathematics and Statistics

Class Group	*n*	*M*	*SD*
Freshman/Sophomore	57	47.56	8.31
Junior/Senior	85	49.32	7.01

Department of Physics and Astronomy

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 four coefficient values were within the range of normality (i.e., +/-3, Onwuegbuzie & Daniel, 2002). Coefficient values are presented in Table 14. 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, $p = .964$. Descriptive statistics for this analysis are presented in Table 15.

Table 14
Standardized Skewness Coefficients and Standardized Kurtosis Coefficients for Teamwork Scores by Class Group for the Department of Physics

Class Group	Standardized Skewness Coefficient	Standardized Kurtosis Coefficient
Freshman/Sophomore	-1.05	-0.44
Junior/Senior	-1.05	-0.20

Table 15
Descriptive Statistics for Teamwork Scores by Class Group for the Department of Physics

Class Group	*n*	*M*	*SD*
Freshman/Sophomore	5	48.00	6.78
Junior/Senior	9	51.67	7.63

Results: One-Way Analysis of Variance (ANOVA)

The following research question guided this investigation: What is the difference between groups based on the number of teamwork experiences and the total TSRI score?

Results Summary

The results for the College of Science and Engineering Technology revealed that TSRI scores were statistically significantly higher for students with ten or more teamwork experiences and students with seven to nine teamwork experiences compared to students with no teamwork experience. Results for the School of Agricultural Sciences were also statistically significant; however, a pairwise comparison revealed no statistically significant differences between specific groups. For the Departments of Biology, Chemistry, Computer Science, Environmental and Geosciences, Mathematics and Statistics, and Physics and Astronomy, the results were not statistically significant. The Department of Engineering Technology did not participate in the TSRI during the 2022-2023 academic year.

College of Science and Engineering Technology

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 of the coefficients were within the +/- 3 range of normality (Onwuegbuzie & Daniel, 2002); therefore, the assumption for a normal distribution for a parametric one-way analysis of variance

(ANOVA) 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 not present (p = .018); however, according to Field (2009), the parametric ANOVA is sufficiently robust that this violation can be withstood. Accordingly, a parametric one-way ANOVA statistical procedure was performed.

Table 16
Standardized Skewness Coefficients and Standardized Kurtosis Coefficients for TSRI Scores and Number of Teamwork Experiences for the College of Science and Engineering Technology

Group	Standardized Skewness Coefficient	Standardized Kurtosis Coefficient
1	0.38	-1.12
2	0.07	-1.23
3	0.69	0.02
4	-1.11	0.14
5	0.31	-2.15

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, $F(4,425) = 5.75$, $p < .001$, partial $n^2 = .051$. The effect size for this difference was medium. Scheffe post hoc results revealed that TSRI scores were statistically significantly higher for students with ten or more teamwork experiences and students with seven to nine teamwork experiences compared to students with no teamwork experience. Table 17 contains the descriptive statistics for TSRI scores and the number of teamwork experiences for participating departments in the College of Science and Engineering Technology.

Table 17
Descriptive Statistics for TSRI Scores and Number of Teamwork Experiences for the College of Science and Engineering Technology

Group	*n* of teamwork experiences	*n*	*M*	*SD*
1	0	18	44.22	9.46
2	1-3	109	48.89	7.64
3	4-6	129	49.01	7.15
4	7-9	55	51.73	7.72
5	10 or more	119	51.78	8.37

School of Agricultural Sciences

The assumptions regarding the independent and dependent variables for a parametric one-way ANOVA were met. The standardized skewness and kurtosis coefficients were calculated to determine if the data were normally distributed. 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 of the data was met. The standardized skewness and kurtosis coefficients are presented in Table 18. A Levene's test was performed for homogeneity of variance. This result revealed that homogeneity of variance was present (p = .758).

Because all of the necessary assumptions were met, a parametric one-way ANOVA statistical procedure was performed to determine the extent to which differences were present in students' total teamwork scores as a function of their number of teamwork experiences. Results revealed a statistically significant difference, $F(3,55)$, $p = .017$, partial $n^2 = .167$. The effect size for this difference was large. However, the results for a Scheffe post hoc revealed no statistically significant difference between any of the five groups. Descriptive statistics for this analysis are provided in Table 19.

Table 18
Standardized Skewness Coefficients and Standardized Kurtosis Coefficients for TSRI Scores and Number of Teamwork Experiences for the School of Agricultural Sciences

Group	Standardized Skewness Coefficient	Standardized Kurtosis Coefficient
1	*	*
2	-0.51	-0.96
3	-0.56	0.10
4	0.54	0.57
5	-1.06	0.02

*Note: These coefficients could not be calculated because $n = 0$.

Table 19
Descriptive Statistics for TSRI Scores and Number of Teamwork Experiences for the School of Agricultural Sciences

Group	*n* of teamwork experiences	*n*	*M*	*SD*
1	0	0	-	-
2	1-3	13	54.08	7.13
3	4-6	22	48.59	6.78
4	7-9	4	59.00	5.35
5	10 or more	20	52.60	6.87

Department of Biological Sciences

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 eight of the ten coefficient values 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 20. A Levene's test was performed for the fourth assumption regarding homogeneity of variance. This result revealed that homogeneity of variance was not present ($p = .018$); however, according to Field (2009), the parametric ANOVA is sufficiently robust that this violation can be withstood. Accordingly, a parametric one-way ANOVA statistical procedure was performed.

Table 20

Standardized Skewness Coefficients and Standardized Kurtosis Coefficients for TSRI Scores and Number of Teamwork Experiences for the Department of Biological Sciences

Group	Standardized Skewness Coefficient	Standardized Kurtosis Coefficient
1	*	*
2	-0.05	0.24
3	0.63	0.20
4	0.42	-1.01
5	-0.72	-0.98

*Note: These coefficients could not be calculated because $n = 0$.

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 no statistically significant difference, $p = .183$. Table 21 contains the descriptive statistics for TSRI scores and the number of teamwork experiences for the Department of Biological Sciences.

Table 21

Descriptive Statistics for TSRI Scores and Number of Teamwork Experiences for the Department of Biological Sciences

Group	*n* of teamwork experiences	*n*	*M*	*SD*
1	0	-	-	-
2	1-3	6	49.00	6.13
3	4-6	14	49.64	6.77
4	7-9	7	55.86	6.41
5	10 or more	18	53.61	8.56

Department of Chemistry

The assumptions regarding the independent and dependent variables for a parametric one-way ANOVA were met. To determine if the data were normally distributed, the standardized skewness and 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 22. A Levene's test was performed for homogeneity of variance. This result revealed that homogeneity of variance was present ($p = .730$). Because all of the necessary assumptions were met, a parametric one-way ANOVA statistical procedure was performed to determine the extent to which differences were present in students' total teamwork scores as a function of their number of teamwork experiences. Results revealed no statistically significant difference, $p = .295$. Descriptive statistics for this analysis are presented in Table 23.

Table 22

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

Group	Standardized Skewness Coefficient	Standardized Kurtosis Coefficient
1	*	*
2	0.86	0.06
3	1.94	1.17
4	-0.23	-0.48
5	-0.38	-1.62

*Note: These coefficients could not be calculated because the sample size was $n = 0$.

Table 23

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

Group	*n* of teamwork experiences	*n*	*M*	*SD*
1	0	2	52.00	9.90
2	1-3	10	51.70	6.71
3	4-6	25	47.40	7.77
4	7-9	14	47.50	7.11
5	10 or more	36	50.92	8.08

Department of Computer Science

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 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 24. A Levene's test was performed for the fourth assumption regarding homogeneity of variance. This result revealed that homogeneity of variance was present ($p = .039$). Because all assumptions were met, a parametric one-way ANOVA statistical procedure was performed. The results revealed no statistically significant difference between groups, $p = .518$. The descriptive statistics for this analysis are presented in Table 25.

Table 24

Standardized Skewness Coefficients and Standardized Kurtosis Coefficients for TSRI Scores and Number of Teamwork Experiences for the Department of Computer Science

Group	Standardized Skewness Coefficient	Standardized Kurtosis Coefficient
1	*	*
2	-0.26	-1.36
3	2.07	2.55
4	-0.36	1.29
5	-0.63	-0.22

*Note: These coefficients could not be calculated because $n = 0$.

Table 25

Descriptive Statistics for TSRI Scores and Number of Teamwork Experiences for the Department of Computer Science

Group	*n* of teamwork experiences	*n*	*M*	*SD*
1	0	-	-	-
2	1-3	7	47.86	12.67
3	4-6	11	50.18	5.64
4	7-9	8	52.63	9.05
5	10 or more	8	54.38	8.89

Department of Environmental and Geosciences

The assumptions regarding the independent and dependent variables for a parametric one-way ANOVA were met. To determine if the data were normally distributed, the standardized skewness and 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 26. A Levene's test was performed for homogeneity of variance. This result revealed that homogeneity of variance was present ($p = .346$). Because all of the necessary assumptions were met, a parametric one-way ANOVA statistical procedure was performed to determine the extent to which differences were present in students' total teamwork scores as a function of their number of teamwork experiences. Results revealed no statistically significant difference, $p = .161$. Descriptive statistics for this analysis are presented in Table 27.

Table 26

Standardized Skewness Coefficients and Standardized Kurtosis Coefficients for TSRI Scores and Number of Teamwork Experiences for the Department of Environmental and Geosciences

Group	Standardized Skewness Coefficient	Standardized Kurtosis Coefficient
1	*	*
2	0.83	0.20
3	-0.91	-0.14
4	0.61	0.64
5	1.72	-0.35

*Note: These coefficients could not be calculated because $n = 1$.

Table 27

Descriptive Statistics for TSRI Scores and Number of Teamwork Experiences for the Department of Environmental and Geosciences

Group	*n* of teamwork experiences	*n*	*M*	*SD*
1	0	1	36.00	-
2	1-3	10	44.70	6.43
3	4-6	13	50.69	9.52
4	7-9	6	54.50	6.41
5	10 or more	19	48.68	10.49

Department of Mathematics and Statistics

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 ten of the coefficient values 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 28. A Levene's test was performed for the fourth assumption regarding homogeneity of variance. This result revealed that homogeneity of variance was present ($p = .292$). Because all assumptions were met, a parametric one-way ANOVA statistical procedure was performed.

Table 28
Standardized Skewness Coefficients and Standardized Kurtosis Coefficients for TSRI Scores and Number of Teamwork Experiences for the Department of Mathematics and Statistics

Group	Standardized Skewness Coefficient	Standardized Kurtosis Coefficient
1	0.30	-1.04
2	0.33	-0.72
3	0.40	0.37
4	-2.06	1.03
5	-0.21	-0.08

Regarding the extent to which differences were present in students' total teamwork scores as a function of the number of teamwork experiences, the results revealed a statistically significant difference, $F(4,137) = 2.86$, $p = .026$, partial $n^2 = .077$. The effect size for this difference was large. However, the results for a Scheffe post hoc revealed no statistically significant difference between any of the five groups. Descriptive statistics for TSRI scores and the number of teamwork experiences for the Department of Mathematics and Statistics are presented in Table 29.

Table 29
Descriptive Statistics for TSRI Scores and Number of Teamwork Experiences for the Department of Mathematics and Statistics

Group	*n* of teamwork experiences	*n*	*M*	*SD*
1	0	15	43.73	9.38
2	1-3	60	48.10	7.22
3	4-6	38	49.24	6.63
4	7-9	14	50.64	7.33
5	10 or more	15	52.07	7.82

Department of Physics and Astronomy

Because the sample size for the groups was so small, neither a parametric or a nonparametric one-way ANOVA was performed. Table 29 contains the descriptive statistics for TSRI scores and the number of teamwork experiences for the Department of Physics.

Table 29
Descriptive Statistics for TSRI Scores and Number of Teamwork Experiences for the Department of Physics

Group	*n* of teamwork experiences	*n*	*M*	*SD*
1	0	0	-	-
2	1-3	3	49.00	4.36
3	4-6	6	48.50	8.67
4	7-9	2	48.00	8.49
5	10 or more	3	57.00	4.36

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

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

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/