

Assessing Teamwork Using Student Self-Reflections: Evolution of a Locally Developed Instrument

Background of Teamwork Assessment at SHSU

Why assess teamwork?

- To provide valuable programmatic assessment data for the degrees and programs at SHSU
- To satisfy general education assessment requirements. Teamwork is identified as a core objective within the Texas Higher Education Coordinating Board's (THECB) Core Curriculum

How does the THECB define teamwork?

- The ability to consider different points of view and to work effectively with others to support a shared purpose or goal

Hypotheses

As a result of the teamwork assessment, we expected to observe the following:

- Students with more teamwork experiences will demonstrate higher total TSRI scores
- Students enrolled in upper-division (i.e., junior- and senior-level) courses would demonstrate higher TSRI scores than those enrolled in lower-division (i.e., freshman- and sophomore-level) courses

Development and Methods of the Teamwork Self Reflection Instrument (TSRI)

In the 2016-2017 academic year, SHSU completed a teamwork assessment pilot.

- Paper format adapted from the AAC&U Teamwork VALUE Rubric
- In-person classroom administration to all colleges that responded to our call for volunteers
- 580 completed, but only 84% were usable due to students not following instructions correctly

In Fall 2017, SHSU piloted an electronic version of the TSRI using the Qualtrics survey platform.

- Evaluated strengths and weaknesses of initial pilot to adapt paper TSRI to an electronic version
- Scheduled emails sent to students in participating classrooms within two of our colleges, instructor participation highly encouraged
- 541 students received emails and 403 students provided responses, resulting in a 74.49% response rate

Structure and Scoring of the TSRI

The TSRI consists of 17 Likert-Scale questions. Each question presented students with a series of statements regarding different elements of teamwork and asked the students to select the statement they most agreed with. Questions were designed to explore student perceptions of their contributions to group activities and discussions, their time and task management skills, their interactions with group members, and their responses to intergroup conflict and disagreement.

- Three additional questions at the end of the survey asked students to estimate the number of teamwork experiences they have had at SHSU, to rate their ability to work with others on a Likert scale, and to estimate their teamwork skills in comparison to other students completing the survey.

To score the TSRI, the potential responses to each of the 17 questions are assigned a point value (-1, 1, 2, and 3), reflecting each responses relative level of development. Responses valued at -1 demonstrate negative teamwork characteristics, while responses valued at 3 showed the highest levels of development. Scores for the instrument can range from a minimum of -17 to a maximum of 51.

Instrument Reliability

Ensuring the reliability of testing instruments, like the TSRI, is an important step in using these instruments to better understand student learning and behaviors (Roberts, Wright, & Sanford, 2017). Therefore, exploratory factor analysis (EFA) and reliability analysis were conducted prior to data analysis to determine the underlying factor structure of the instrument, the reliability of these factors, and the overall reliability of the instrument.

An exploratory factor analysis revealed the possibility of four underlying factors each meeting the eigenvalue-greater-than-one-rule (Kaiser, 1958):

- Three were ultimately demonstrated to be reliable using internal consistency analysis
- Relative fit of questions within each of the factors was determined using the correlational cutoff of .3 (Lambert & Durand, 1975)

Reliability Analysis Revealed Three Reliable Factors:

- Factor One – Interactions with Group Members
 - Cronbach's Alpha = .78
- Factor Two – Engagement in Group Activities and Discussion
 - Cronbach's Alpha = .78
- Factor Three – Responses to Intergroup Conflict
 - Cronbach's Alpha = .76

Question Number	Factor One Interactions with Group Members (Reliable)	Factor Two Engagement in Group Activities and Discussions (Reliable)	Factor Three Responses to Intergroup Conflict or Disagreement (Reliable)	Factor #4 (Not Reliable)
Question 1	.100	.577	.065	.452
Question 2	-.013	-.031	-.292	.515
Question 3	.104	.725	.166	.031
Question 4	.012	.768	.209	.064
Question 5	.070	.771	.207	.051
Question 6	.266	.412	.306	-.006
Question 7	.091	.349	.353	.386
Question 8	.149	.313	.276	.442
Question 9	.156	.036	-.129	.750
Question 10	.732	.006	.087	.028
Question 11	.801	-.002	.145	.021
Question 12	.776	.078	.042	.095
Question 13	.680	.145	.197	.062
Question 14	.536	.241	.109	.224
Question 15	.149	.110	.751	.072
Question 16	.180	.286	.707	.125
Question 17	.165	.249	.758	.049

Two questions (Question 2 and Question 9) did not factor into any of the three reliable factors. Furthermore, the overall reliability of the instrument was (slightly) improved with their deletion (.838 to .844). These questions will be revised prior to the Fall 2018 administration.

Results

A parametric Analysis of Variance (ANOVA) procedure was used to calculate differences in student TSRI Scores as a function of level of self-reported teamwork experiences (i.e., 0 experiences, 1-3 experiences, 4-6 experiences, 7-9 experiences, 10 or more experiences). Although students with more self-reported teamwork experiences demonstrated higher mean scores than those with fewer teamwork experiences, these results were not statistically significant ($F(4, 398) = 1.26, p = .28, r^2 = .01$).

A parametric independent samples *t*-test revealed that the TSRI scores of students enrolled in lower-division courses were statistically significantly lower than those of students enrolled in upper-division courses, $t(253.54) = -1.99, p = .05$. This difference represented a small effect size (Cohen's *d*) of 0.28.

The overall Mean score for all students was 31.14, with scores ranging from a low of 1 to a high of 51.

Number of Teamwork Experiences	N of students	M	SD
0 Experiences	15	28.27	9.22
1-3 Experiences	129	30.16	10.31
4-6 Experiences	141	31.27	9.01
7-9 Experiences	50	32.78	8.46
10 or More Experiences	68	32.18	9.85

Course Level	N of students	M	SD
Lower Division	270	30.47	9.38
Upper Division	133	32.50	9.76

Next Steps

- Exploring the student scores within the three reliable factors will provide more information when analyzing data for future use.
- Statistical analysis revealed that two of the questions must be revised in order to increase the validity of the TSRI. Plans are underway to have an updated version ready for fall 2018.
- A potential change in the way each answer was scored will be considered, due to Qualtrics inability to calculate the negative scores.
- Deeper analysis of institutional data is forthcoming in an effort to keep equity in mind when presenting findings to appropriate constituents at SHSU.
- The transition from a pilot project to full roll-out to colleges will occur in fall 2018. Colleges will be selected based on their placement in the core curriculum assessment projects rotation.

Conclusions and Questions for Further Discussion

Highlights:

- One of the two hypotheses was met!

- Instrument was reliable overall

- Approach to administration was a success, with some minor tweaks for next year

- High response rate due to instructor participation and incentives

Questions:

- Will a larger and more representative sample size result in statistically significant results regarding the relationship between overall TSRI score and number of teamwork experiences?
- Will we discover that this relationship is simply the result of a natural growth in maturity of the students?
- Will our results of future administrations be duplicated or will we see more pronounced trends?

