UNIVERSITY OF TEXAS ARLINGTON

An Experimental "Assembling Effective Teams" Homework Assignment, and Mixed-Methods Assessment

Martin K. Wallace
University of Texas at Arlington Libraries

COLLABORATE UTA — QUALITY ENHANCEMENT PLAN

Abstract

This project considers an experimental homework assignment that asks students in a project management course to assemble effective project teams based on simulated skills & competencies data, much like a real-world project manager would do. A pre- and post-self-assessment survey and an analytic rubric are used to assess student understanding of assembling effective teams. Preliminary results indicate that the assignment leads to student competence related to assembling effective teams.

Introduction

While a great deal of importance has been placed on the need to stratify our students with teamwork and collaboration competencies, often the process of assembling effective teams is trivialized or omitted entirely from this conversation. Students are routinely placed into teams by their instructors by rather arbitrary criteria, or the students themselves self-select their teammates based on equally arbitrary criteria.

There is a need to teach students how to assemble effective teams where each team member's pre-existing competencies, skills and dispositions may be brought to bear and capitalized upon in order to accomplish a specified goal, to solve a complicated problem, or to complete a multi-faceted project.

To this end, I collaborated with Dr. Jaime Cantu to develop a homework assignment and mixed-methods assessment of students in an Engineering Project Management course. The assignment and assessment methodology are built around learning outcomes that emphasize assembling effective teams. Students will assemble effective teams by:

1. recognizing opportunities to collaborate with others who provide diverse experiences and perspectives
2. gauging the costs & benefits of "Doing-it-Yourself" (DIY) or "Doing-it-Together" (DIT)
3. recruiting team members with diverse skills appropriate for specific project requirements
4. joining a team where one's skills are sought and valued

Figure 3. Sample Pre- and Post- Self Assessment Questions.

Methods and Materials

Homework Assignment
We designed a homework assignment wherein students would use anonymized data gathered from all students in the class regarding each student's pre-existing knowledge, skills and competencies related to project management and teamwork, and specifications for successfully completing a semester-long project in UTA Libraries FabLab. The homework assignment asked students to use the anonymized data to assemble an effective "Dream Team" by identifying team members from the data that possessed the best qualities for successfully completing the project; and to "Spread the Awesomeness" by placing every student in the class onto a team, where all teams would be equally balanced.

Pre- and Post- Self-Assessment Surveys
We used a pre-self-assessment survey in order to gather data from students. Data from this survey was anonymized and given to students with the homework assignment. The data also served as a useful baseline for understanding student self-perceptions of their competencies at the beginning of the semester.

We used a post-self-assessment survey to measure the increase in competency after having successfully completing their FabLab projects. In both the pre- and post- surveys, students were asked to rate their competency in each of the four learning outcomes (among many other things). The surveys served as indirect, summative assessment tools.

Analytic Rubric
Lastly, we designed an analytic rubric for direct, formative assessment, also focusing on the four learning outcomes.

Results

Pre- and Post- Self-Assessment Surveys
In the pre- and post- self-assessment surveys, each learning outcome was presented as a Likert scale. All scales range from 1-5, with 1 being no competency and 5 being high competency. A student's score is calculated by averaging the four scales together. Aggregate scores are calculated by averaging all student scores together. The outcomes comparisons In Figure 1 use aggregate scores.

Students overestimated their competency by 7.32247% difference, and gained 18.1285% increase in their ability to assemble effective teams.

Scores by Analytic Rubric
Expectations:
1. At least 80% of the students will complete the assignment.
2. At least 80% of the students will demonstrate comprehension by a score of 70% or better.

As shown in Figure 2, almost all (24/27) = 88.9% of the students successfully completed the assignment and scored 70% or better. Therefore, both stated expectations have been met.

Discussion

Key to our data collection and analysis is the use of a pre- measurement and two post- measurements, which I'll call "Reflection" and "Now". During the post-self-assessment, students are asked to think back to the beginning of the semester and re-rate their competency before completing their makerspace project, and then, of course, to rate their competency after completing the project. An example is shown in Figure 3.

We did this to avoid an exhibited problem inherent with simply asking students to rate themselves at the beginning and then again at the end of the course. Students tend to overestimate their competence at the beginning of the semester, because they either do not fully understand what it is that they are rating students themselves on, or because they do not yet know what they do not know. As is shown by the data, students tend to rate their beginning competence lower when reflecting back during the post-self-assessment survey than they did on the pre-self-assessment survey. By adding the "Reflection" and "Now" measurements to the post-self-assessment survey, forcing them to think back to the beginning of the courser, they are likely to provide a more accurate response regarding their competence at the beginning and end of the semester. Further, they are providing us a relative measure of how much competence they believe they gained through completing the assignment.

Conclusions

We have a proof of concept assignment for students to assemble effective teams, and a mixed-methods approach for assessing student success. Future efforts will see revisions of the rubric to more accurately capture data about student learning outcomes, as well as continual refinement of the homework assignment and rubric. We can use the data over time to determine best practices for future iterations.
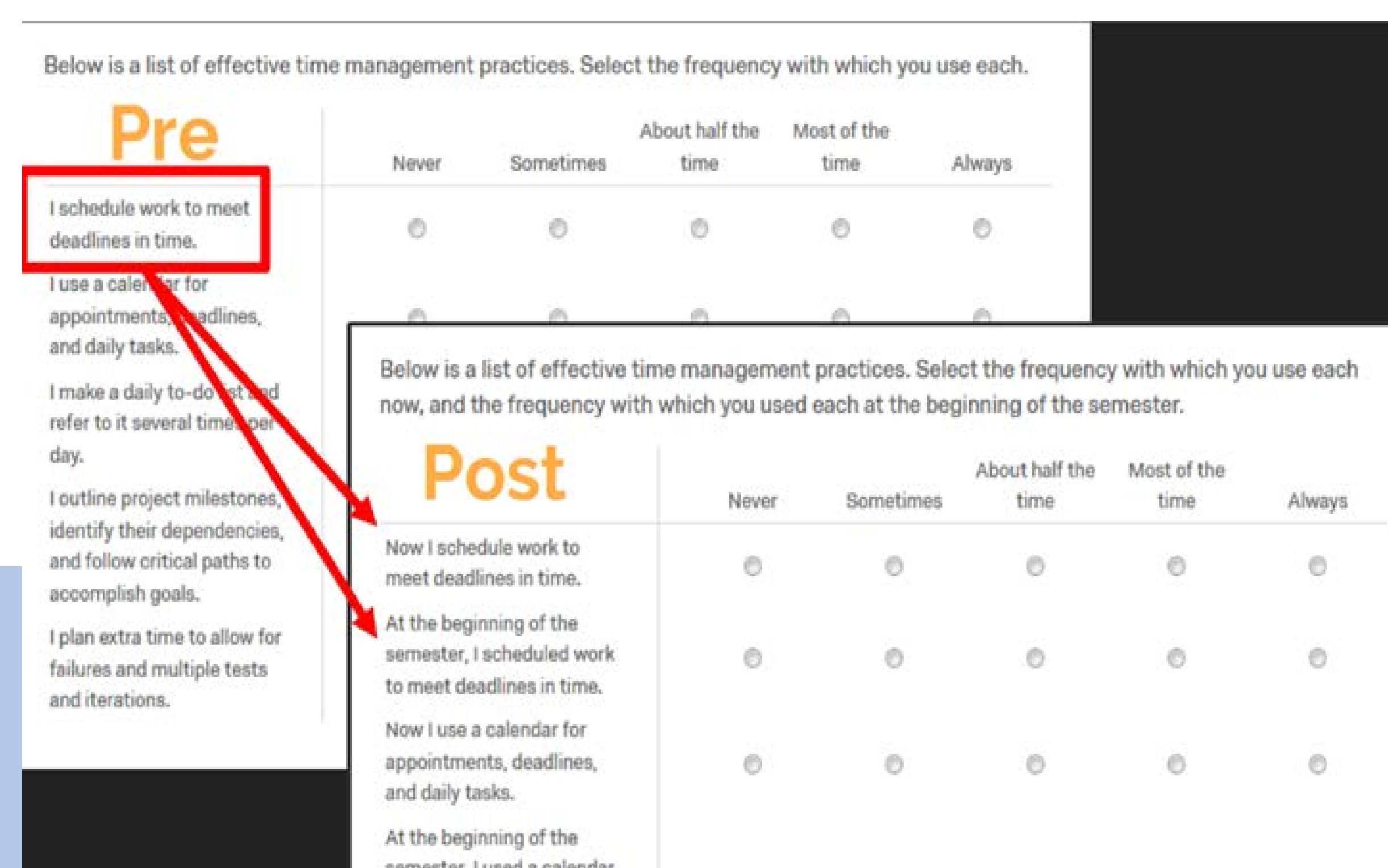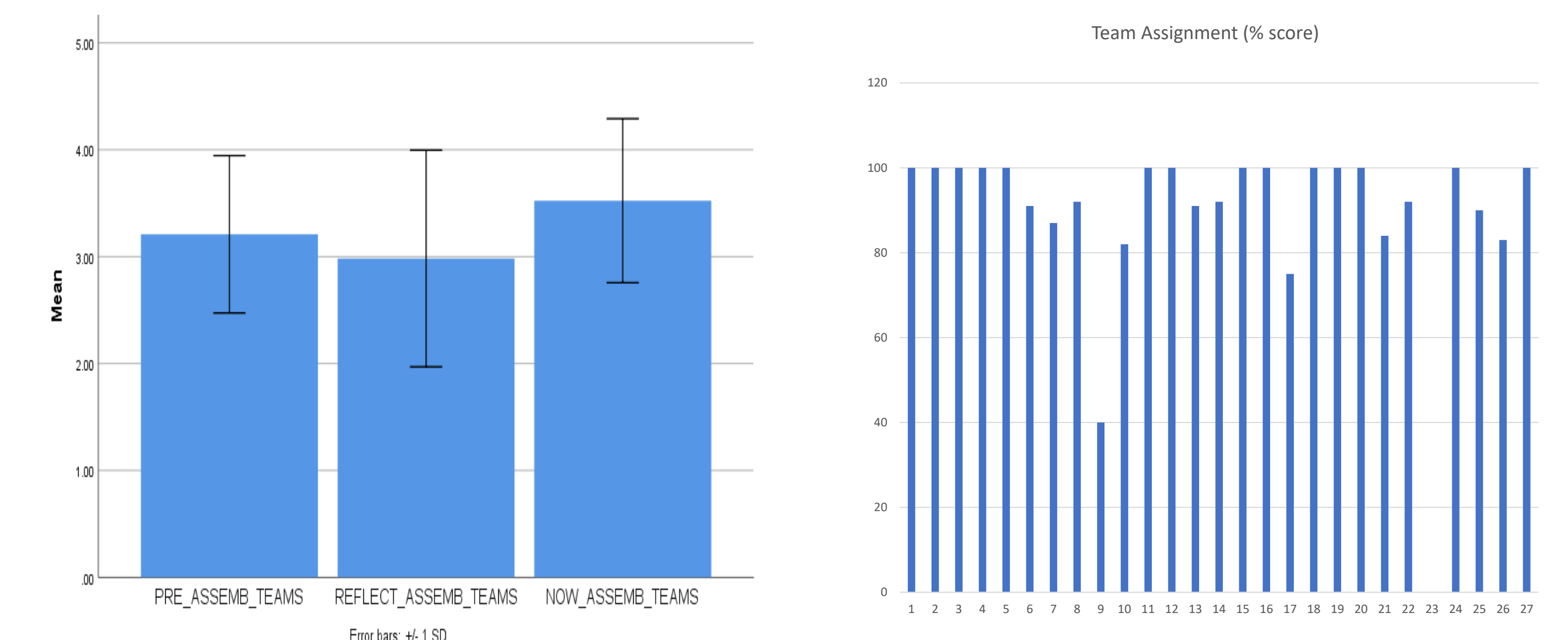

Figure 1. Pre, Reflection and Now Comparisons.

Figure 2. Scores by Rubric.

Contact

Martin K. Wallace
University of Texas at Arlington Libraries
Martin.Wallace@uta.edu
(817) 272-3924