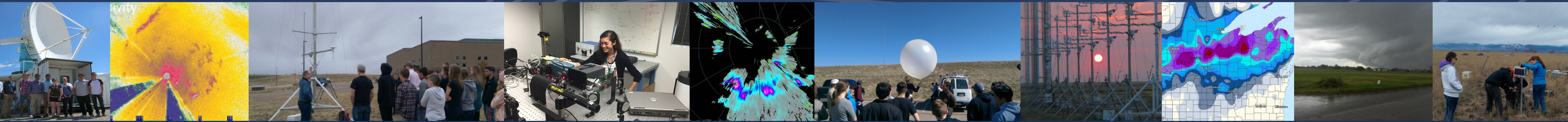


INTERACTIVE ONLINE TRAINING IN INSTRUMENTATION AND MEASUREMENT OF ATMOSPHERIC PARAMETERS

BUILDING THE FOUNDATION FOR FIELD RESEARCH

ROCKWELL, ALISON, NCAR EARTH OBSERVING LABORATORY¹, BOULDER, CO; R. CLARK, MILLERSVILLE UNIVERSITY; E. PAGE, THE COMET PROGRAM²; A., BOL²; T. CAMPOS, NCAR ACOM; W. COOPER¹; J. HAGGERTY¹; A. STEVERMER²; H. VÖMEL¹; C. WOLFF¹



PROGRAM OVERVIEW

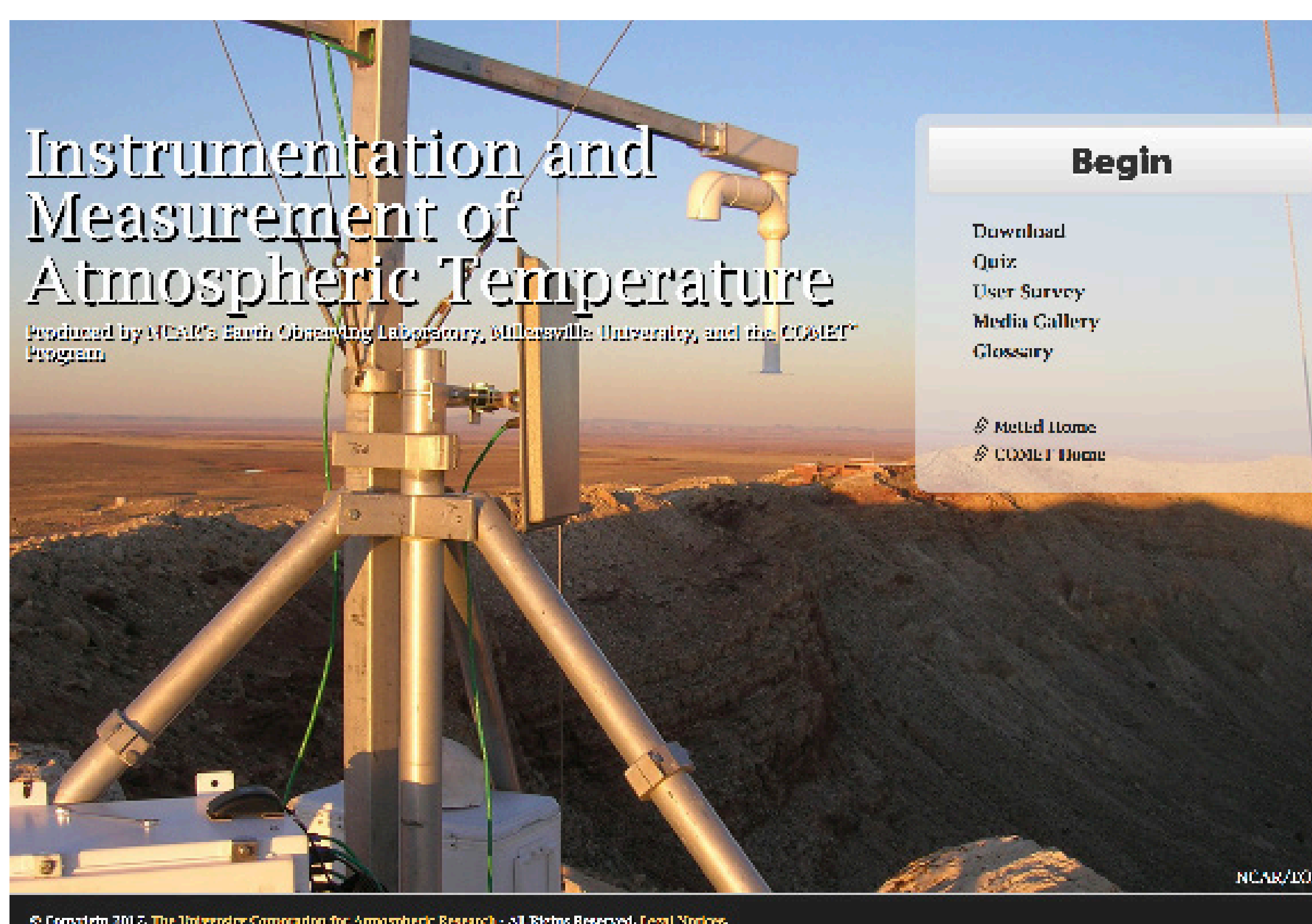
A series of ten meteorological instrumentation and measurement training lessons for undergraduate and graduate education was collaboratively produced by the NCAR Earth Observing Laboratory, Millersville University, and The COMET Program, with funding from the National Science Foundation (Award Nos. 1642735, and 1642643.) The lessons are freely available online and include both English-language and Spanish-language versions.

This course provides approximately 20 hours of atmospheric instrumentation training. The lessons can help with successful instrument siting and data collection for various efforts, and can enhance traditional instruction on topics such as instrument types, measurement techniques, site selection, and measurement uncertainty. A free MetEd login is required.

- » **NCAR Earth Observing Laboratory** staff serve as subject matter experts, content developer leads, and provide project coordination.
- » **COMET MetEd** provides instructional design, video development and graphic design; their platform has over 670,000 users and is growing; free, easy registration and option to sign up for new publication alerts.
- » **Millersville University** PI serves as instructional content integrator, subject matter expert and provides educational rigor oversight.

INSTRUCTIONAL ELEMENTS

- » Includes well-planned learning objectives to guide content and assessments.
- » Serves to augment face-to-face instruction in courses for instrumentation, measurement, and observing systems; can also be used in total or in part as content material in other courses and with other delivery formats.
- » Engages the students in forward-thinking measurement techniques and technology by teaching fundamental principles, basic mathematical, engineering underpinnings, and subject area content and context.
- » Includes videos, animations, graphics, interactive educational tools, and assessments with scores able to be emailed to instructors.



Instrumentation and Measurement of Atmospheric Temperature lesson home page.

ACCESS ALL LESSONS

meted.ucar.edu/courses/instrumentation

LESSON TITLES

1.	Foundations of Meteorological Instrumentation and Measurements
2.	Instrument Performance Characteristics
3.	Instrumentation and Measurement of Atmospheric Temperature
4.	Instrumentation and Measurement of Atmospheric Pressure
5.	Instrumentation and Measurement of Atmospheric Humidity
6.	Instrumentation and Measurement of Atmospheric Winds
7.	Instrumentation and Measurement of Surface Precipitation
8.	Instrumentation and Measurement of Atmospheric Radiation
9.	Instrumentation and Measurement of Atmospheric Hydrometeors and Aerosols
10.	Instrumentation and Measurement of Atmospheric Trace Gases

LESSON USAGE FROM 2017-SEP 2020

Table 1
Total sessions by users of the English and Spanish versions from 2017 through 30 September 2020

Language	2017	2018	2019	2020	Totals
English	3025	2619	3703	5811	15,158
Spanish	N/A	718	1999	2390	5,107
Totals	3025	3337	5702	8201	20,265

ENGLISH & SPANISH LESSON SESSIONS VS MONTHS AVAILABLE

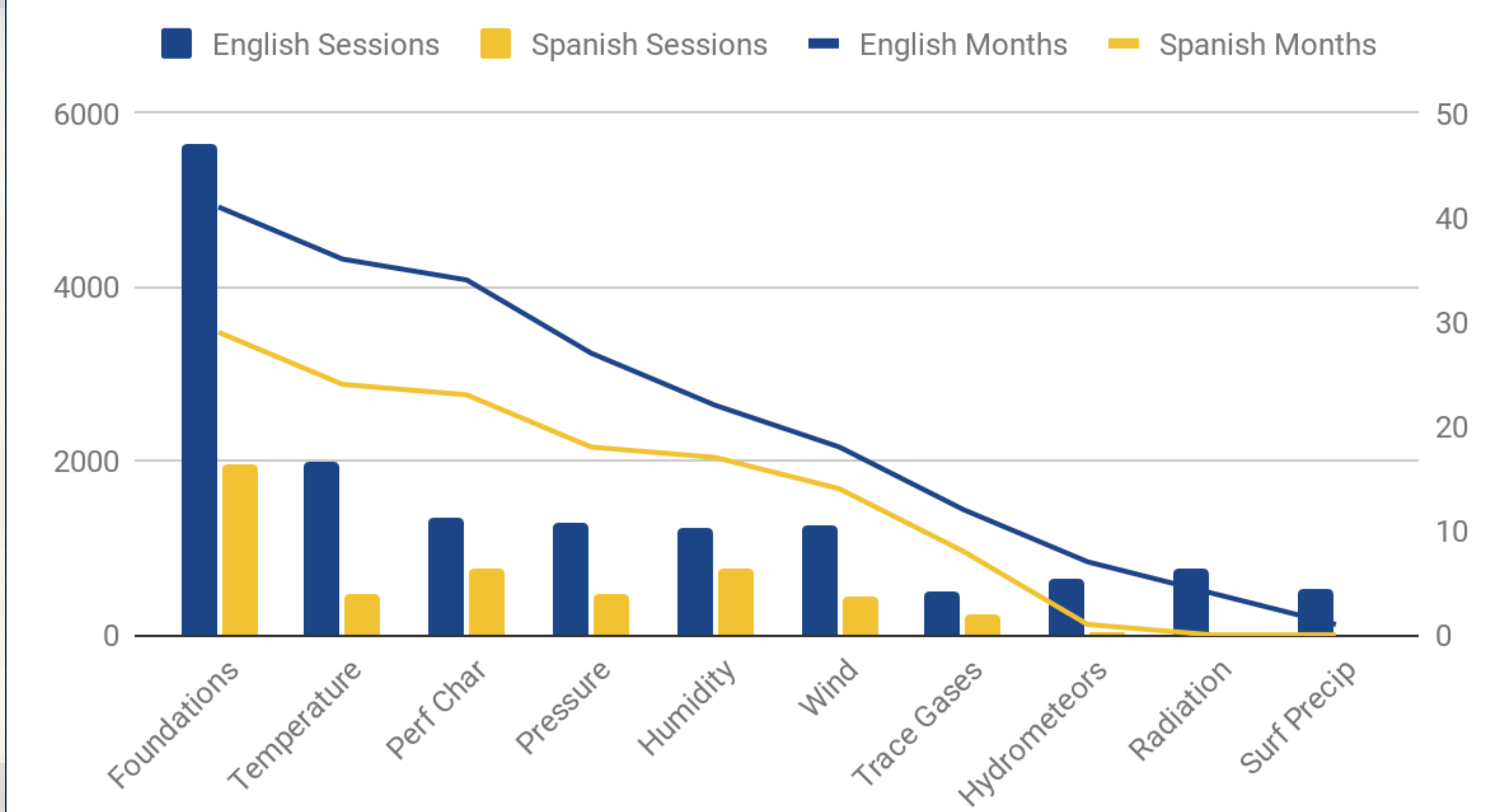


Figure 1. The figure above shows the English and Spanish lessons session use (columns) plotted with the number of months each lesson has been available (lines).

MEDIAN PRE- AND POST-ASSESSMENT SCORES FOR EACH LESSON DEMONSTRATING LEARNING OCCURRED

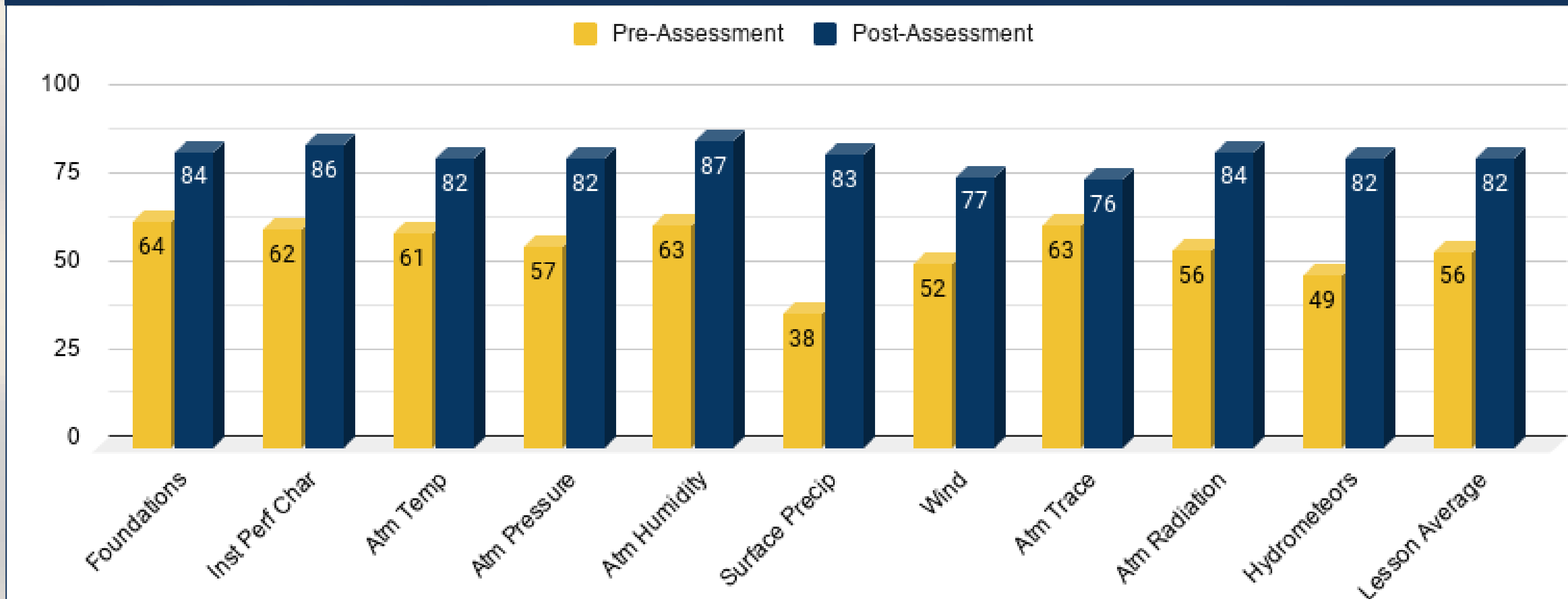


Figure 2. The median scores of the pre- and post-assessments of users increased by 20 points or more for nine out of the ten lessons. The pre-assessment score is shown in yellow and the post-assessment scores are shown in dark blue. The average pre-assessment score was 57 and the average post-assessment score was 82 out of a possible 100 points.

COMMUNITY COLLABORATORS

