

I believe that at the core of all successful teaching in Atmospheric Science is the ability to convey the excitement of the subject to students in the classroom and the field, and thus instill in students a desire to learn more about the natural world. This requires an emphasis on the Earth and atmosphere as a dynamic system about which we still have an incredible amount to learn. In this context, basic skills and principles in Atmospheric Science are taught as tools with which to scientifically address problems and to critically assess the existing state of knowledge, rather than as part of a final set of facts that students are merely expected to memorize for a grade. I think this approach is essential both for attracting majors to the science and for developing in non-majors a greater awareness and appreciation of the natural environment.

I feel that the most effective teachers engage students by asking questions in the classroom, incorporating innovative labs and challenging problem-solving projects, encouraging peer-to-peer interaction through group work and study, and including a wealth of real-world examples of the principles being discussed. I recognize the central importance of the teacher's approachability and accessibility that are crucial to developing an environment that emphasizes discussion about science and becomes a mutual learning experience rather than a distant monolog. This requires an important time commitment outside the classroom to meet and interact both with students who need extra assistance and with exceptional students who could benefit greatly from potential research opportunities. It also requires the ability to adapt Atmospheric Science content to a variety of student skill levels (from undergraduate to graduate) and to maximize understanding and retention of information. This can be achieved through the use innovative methods to encourage student learning, expand student involvement inside the classroom, and extend student interactions with peers and scientists outside the traditional classroom instructional environment.

Since the beginning of my teaching career, I have used past experiences in the classroom to influence, develop, and inspire new directions, methods, and innovations in my courses. The general content of the courses, such as Weather and Climate or Introduction to Meteorology, don't change from semester to semester but the learning tools and ways of interacting with students evolve as new technology and opportunities present themselves. Teaching and learning are not static, each semester, each class, each student, needs to be cultivated differently. Course content is also changed subtly from semester to semester to incorporate current global and local weather events keeping the material relevant to students. Highlights of major weather events around the world and Hawaiian weather patterns, such as hurricanes or Kona lows, are of particular focus here at UH. I firmly believe that to provide a large number of undergraduates, graduate students, and the community with an introduction to weather, climate, and how humans interact with the atmosphere, innovative teaching techniques that accommodate individuals with various learning styles and needs must be employed.

Most recently, upon starting as an Assistant Professor in the Atmospheric Sciences Department at UH Mānoa in 2012, I began incorporating a host of multi-media activities and tools into my Introduction to Meteorology courses. The motivation came from society's shift to a world filled with "tweets" and "texts" and constant multi-media bombardment on TV and Smart Phones. In this new media-rich world, it is becoming increasingly difficult to engage students in the learning process by simply standing at a podium and lecturing in a darkened classroom. Educational research has found that lectures place students in a passive role, preventing them from actively engaging in the learning process. Students are now, more than ever, distracted by smartphones and laptops connected to the internet while in class. One key method for improving student activity in class and prevent distractions is the implementation of small-group learning opportunities such as class lecture summaries, or group problem-solving activities to assist with homework assignments, or group problem solving on exams (that count as a fraction of their overall

grade). This allows students to not only interact with the instructor but with fellow peers, developing valuable communication skills and confidence. Integration of multimedia activities such as online quizzes during class (which I will be implementing in my upcoming semester using the iClicker system) and in class internet searches for information gathering during small group problem solving allows students to use technology for guided classroom activities.

Additionally, through the innovative use of multi-media platforms (YouTube, blogs, websites, e-books, and videos) I can connect theoretical “textbook” atmospheric science with the “real world.” Over the last eight semesters at UH I have successfully incorporated YouTube videos, “blockbuster” movies, real-time weather discussions, and blogs into class lectures and activities by linking current news and media representations of science to course topics. For the last four semesters, I have used the “course-casting” technique which utilizes podcasts of lectures as a revision tool for students before midterms and final exams. Each lecture is recorded, with other supplemental material as needed, and supplied for download from the course website (with accompanying presentation slides). This provides students with on-demand portable (MP3) course content that supports independent student learning. In one semester, students produced their podcasts (research projects) to share with classmates throughout the course relating atmospheric science content to personal “real world” experiences. The assessment of the success of using podcasts as a revision and learning tool has been conducted with exit surveys and records of the number of downloads of each podcast.

As an expert in observational meteorology and satellite meteorology, it is of particular interest to me to incorporate experiential learning related to observing the environment. In my courses, students can interact with real-time satellite data and weather forecasts for homework and semester-long blogging assignments. I recognize an important part of course development and improvement is the assessment of student literacy through exposure to these current data and “real-time” science. Throughout my courses, students read material from the local, national or international media related to atmospheric or climate science and write about them by addressing guided thought questions (on homework or for blogging purposes). In this manner, students express and discuss their understanding, asking their questions, building confidence and content knowledge simultaneously. This is a characteristic of an experiential/teaching-learning sequence that aims at interlacing the scientific and student perspective.

With climate change and its global impacts ever-present in the media, access to accurate and current representations of our atmosphere in all formats will aid in increasing the overall science literacy, related to atmospheric and climate science, within UH Mānoa and the community at large. It is well known that representations of science in mainstream media guide public ideas and opinions on science. Thus, through curriculum used here at UH, I aim to provide students with the tools necessary to make informed decisions when evaluating climate science in the media. Through carefully structured coursework students are engaged by learning how current technologies are applied to important tasks such as determining sea level rise danger, hurricane track prediction, assessing anthropogenic influences on climate change and exploring new connection in the climate system.

For graduate level students a goal of my teaching and mentoring is to provide students with marketable skills when applying for future Ph.D., Postdoctoral, Academic, Private or Government positions upon leaving UH Mānoa. Students should graduate with skills that will support them in a fast-paced, highly competitive world where computing, data, and communication skills are invaluable. As an example, my graduate level Satellite Data Applications course provides students with hands-on computing and coding

experience using 14 different satellite data systems. Students complete the course with the ability to use not only specific data that are desirable in the Earth and Environmental Sciences but desirable skills dealing with “Big Data” and large databases. As an educator, it is my responsibility to provide my students with courses that can benefit them in their academic careers and future employment as members of the greater scientific community.

Another key tenet of my teaching is the clear presentation of expectations and availability of course materials. Students in my courses receive detailed syllabi outlining the course content, readings, homework, project and other assignments, grading conventions, participation expectations and other relevant information. Each course also has an independent web page on which students can find lecture notes, podcasts of lectures (for Introduction to Meteorology), all assignments and solutions, readings, study guides for exams and exam solutions, office hours, and extra links or material covered in the course. Students are always aware of performance expectations and are provided with the guidance, support, and mentoring throughout a course to succeed.

Finally, a cornerstone of my teaching philosophy is that all students, regardless of culture, ethnic and gender differences, deserve an understanding and approachable teacher and learning environment based on respect. My classrooms are safe spaces for all students to interact and contribute equally. Students arrive at UH from all over the world, with different backgrounds and experiences. As a Professor, it is my job to adapt to student needs, and help students better interact with each other and the rest of society. With continued globalization, students are interacting with the world-at-large in new and more technological ways than ever before. In my Introduction to Meteorology courses, this globalization concept is targeted through the semester-long blogging assignment whereby students are assigned a country (at random). Throughout the semester they learn about weather and climate in their assigned country while also learning about the countries culture, political system, economy, and geography. Students are forced to step out of a Hawaiian and US centered viewpoint and learn about other cultures by doing their research and reading and commenting on blogs written by their classmates. Pushing boundaries, in a supportive and safe manner, allows students to grow and expand their knowledge of the diverse world around them.

As an educator, it is also my duty to support those who struggle and are underrepresented in the academic community, especially in Science, Technology, Engineering, and Math (STEM). To fulfill this duty, I founded Expanding Your Horizons – Hawaii (EYH-Hawaii), a community outreach program that exposes young women in 6-8th grade to opportunities in STEM. EYH-Hawaii also has a goal of increasing the number of students of Native Hawaiian and Pacific Island descent to pursue degrees and careers in STEM. I believe that it is vitally important that faculty support programs designed to engage sK-12 students and promote interest in pursuing college and advanced degrees.

In summary, I looking forward to the continued challenges and benefits of teaching and advising students at the undergraduate, graduate, and K-12 levels. I strive to make an impact in our community by improving the scientific literacy of our students through innovative and engaging Atmospheric Science courses and increasing the numbers of young women and underrepresented students who are considering careers in STEM through my education outreach activities.