Statement of Teaching and Student Advising

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With 11 years of teaching experience at Kansas State University (K-State) I am a committed professional teacher in both classroom teaching and student advising. I have taught a broad spectrum of statistics courses at various levels that cover theoretical, computational and applied aspects. Overall, I have taught 42 classes with topics covering 17 different courses. Armed with my rich teaching experience and collaboration activities with research investigators and graduate students of different backgrounds, I am a competent, versatile instructor on all statistical courses offered at K-State including applied, theoretical, and computational statistics at both undergraduate and graduate levels.

Throughout my teaching at K-State, I have worked with a diverse audience, some of whom are Ph.D. students with strong mathematical and statistical foundation, while some are students or researchers from other disciplines that can recognize very few statistical terms. Regardless of their background and level, one of my aspirations is to share my knowledge of statistics with others in a way that positively impacts their learning experience or research experience. I hope that my students and colleagues can develop a deeper appreciation or passion of statistics through their interactions with me. I use the following principles to achieve this objective: (1) teaching at the level of the audience; (2) engaging the students to learning by adding contents step by step and stimulating students through illustrative examples; (3) integrating the latest developments in statistical science into the curriculum; (4) providing a positive learning environment and encouraging critical and creative thinking; (5) encouraging students to work hard and develop positive learning attitude.

(1) Teaching at the level of the audience. Students generally have varying backgrounds in terms of base knowledge, maturity, or motivation. Their learning strategies may vary widely depending on their backgrounds. For effective teaching, I found that the teacher must be able to tailor his/her teaching methodology according to the needs and abilities of his/her students. I constantly ask myself the following questions: What do my students know about the topic? How well do they master the content? What is not clear to them? To find out the level of the audience, I use multiple means. On the first day of a course, I often run a short survey to test the diversity of my students’ prerequisite knowledge and level of understanding. This will help me determine a balanced teaching style so that the whole class can progress in an efficient way. I monitor the pace of my class and the progress of my students by asking them questions, giving them quick quizzes or mini-projects. Responding to students concerns in time is also an effective practice to help learn
the level of the students. There are times when I had to deal with situations where some students are seriously lagging behind, in which cases I usually arrange for them to get extra help to ensure that they catch up with the rest of the class. By the end of a class, I hope to know what topics the students are comfortable to explain to someone who missed the class and what topics they are not comfortable to explain. These help to shape my teaching focus according to the level of the students.

(2) Engaging the students to learning by adding contents step by step and stimulating students through illustrative examples: Many students lack passion or may dread learning statistics due to a common misconception that statistics is boring and analogous to mathematics. In such cases, it is very important to inspire the students and spark their enthusiasm, which often comes after certain competence is acquired with step by step build-up of the content and the learning is rewarded by successful applications in their real life or work. When introducing a new content, I often start with some related materials or examples that the students are familiar with and then move on with questions leading to the new content. Once the students feel curious about the answers to the questions, I feel one step closer to my objective. This is the time to introduce the new material as well as illustrative examples. When students see what they learn can help them in their own life or work, they feel happy and rewarded. Sometimes the same examples may be used frequently by adding a little new component each time. This will give the students a sense of reward by being able to connect between the known and the unknown, which may also boost the interest of learning more detailed contents.

(3) Integrating the latest developments in statistical science into the curriculum. Statistics is a dynamic and changing field with many recent advances. New methodology and rich computing is important for statistical education and practice in this era of multi-disciplinary, data-centric scientific collaboration. Integrating various aspects of advances into the statistics curricula helps the students to widen their view and ability to embrace the emerging challenges. This is where the curiosity and enthusiasm are created. It has the effect of a tiny little light source on the lost visitor in a dark tunnel. The integration of latest developments into current curricula can be done for both undergraduate and graduate courses if the students have appropriate background. It could be done by introducing the advances within existing courses or introducing completely new courses.

(4) Providing a positive learning environment by encouraging critical and creative thinking: The beauty of statistics lies in the reasoning and logic behind abstract formulas and numeric calculation. Therefore, it is important to expose the students to these underlying principles than just teaching them how to use the techniques. Without learning the details of why they work, it is
difficult for the students to enjoy and imagine what will happen if the assumptions required are violated. To share the insights, I encourage students to think critically and creatively. I often give some questions for the students to discuss in groups. Students are also encouraged to work in a group on homework problem settings so that they learn from each other during the problem-solving process. I believe that the instructor serves as a facilitator to guide the student in this learning process. Given the material presented, questions leading to further content or open-ended questions are always welcomed. Students discuss their answers to the questions along with the assumptions they make and possibly give counter examples. The instructor provides corrective or guiding advice from time to time. The classroom naturally forms a pleasant atmosphere of inquiry and openness. This strategy will not only lead students actively involved, but also help them to enjoy the class and develop independent thinking.

(5) Encouraging students to work hard and develop positive learning attitude: Positive learning attitude is a critical component to promote an active and effective learning process. Students are encouraged to work hard and understand the responsibility of their learning. For example, the statistical concepts or theories cannot be learned merely through lectures and reading. Frequent assignment of problems will enhance students to study difficult concepts thoroughly. Therefore, completion of homework assignments on time gives students the opportunities to practice and review their new knowledge in different ways. I also encourage students to understand the importance of quality over quantity during the learning process. Efficient reading and previewing materials with purpose, actively taking notes, and quizzing oneself frequently are all more beneficial than reading for a long time without purpose.

I have applied these principles in my teaching and advising and have received positive feedbacks from my students. In my advising, I pass my enthusiasm of statistical research and education on to my own students through their interaction with me during advising. Over the period that they work on their M.S. or Ph.D. research with me, they develop their own competence and passion toward statistical research and applications in applied fields, particularly in medical sciences. How well their enthusiasm has been nurtured can be seen by their career choice as well as their ability to get hired and thrive with their career choice. Here I will give a couple of examples.

Dr. Ke Zhang, a former Ph.D. student graduated in 2008, was offered a job at Abbott Laboratories to conduct statistical research in Phase I clinical trial more than a year before his graduation. After graduation, he continued to work at Abbott for a year and then accepted a tenure track Assistant Professor position at School of Medicine and Health Sciences in University of North Dakota, where he served as the Director of ND INBRE Bioinformatics Core. He is now an
Associate Professor with tenure. After Dr. Zhang left Abbott (current AbbVie), every year AbbVie recruited one student from K-State with my recommendation, either for full time position or internship. Most other Ph.D. students of mine also found their enthusiasm in promoting education and scholarship and intellectual growth of statistics upon their graduation: George von Borries became an Assistant Professor at Univ. of Brasilia; Siti Tolos accepted an Assistant Professor position at International Islamic Univ. of Malaysia; Mohammed Gharaibeh will be an Assistant Professor at Al Al-Bayt University in Jordan.

My passion and competence in teaching and research of Statistics not only are embedded into my Ph.D. students, but also are passed along to my M.S. students. One example is Lei Dong, who wrote a M.S. report with me on a topic to numerically compare several low-dimensional and high-dimensional tests that are applicable to longitudinal data when the experiment contains a large number of treatments or experimental conditions. Upon graduation, he was hired by University of Kansas Medical Center to provide statistical analysis support for medical researchers. He is now a Senior Research Analyst in Department of Biostatistics, and the Data Manager for Office of Scholarly, Academic & Research Mentoring (OSARM), Department of Internal Medicine, University of Kansas Medical Center. A second example is about my former M.S. student Sharad Silwal. Upon graduation with M.S. in statistics and Ph.D. in mathematics, Sharad received two offers of faculty position. For both positions, it was his research and publication with me on statistical image analysis and his ability to teach statistics courses that placed him on top of other candidates. Santosh Ghimire, another former student who wrote a M.S. report with me on image segmentation, is now an Assistant professor of Tribhuvan University, which is the best university in Nepal. These examples not only speak about the quality of my teaching and advising, but also reflect our research directions.

In summary, these principles have worked well in my career. I will continue to applied these principles in my teaching and advising and strive for excellence.