Interview with Michelle Everson

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Beginnings

AR: Hi Michelle. Thanks very much for agreeing to this interview. Congratulations on your appointment as the next editor of the Journal of Statistics Education. *Which came first: your interest in statistics, or your interest in education?*

ME: I am very humbled that you asked to interview me, Allan. So, thank YOU! This is a good first question. I would definitely say my interest in statistics came first. As an undergraduate, I majored in Psychology, and, because I didn't know at the time just what I wanted to do after finishing my degree (i.e., go to grad school or try to get a job right away), I chose an emphasis in Industrial Psychology because I thought it would make me more marketable right after getting my degree. I actually didn't care much for the business and economics courses I had to take as part of this concentration, but the nice thing is that I had to take an extra statistics course, and this prompted me to get a minor in statistics. I then continued to take more statistics courses in graduate school, and it was only after taking a course in the "Psychology of Language" in

graduate school that I decided to go on to pursue a Ph.D. in Educational Psychology (since that course led to my interest in text comprehension, which was my initial focus when I began to work on my doctorate). Of course, this was all before I met Joan Garfield. Once I began working with her, I found her passion for teaching statistics to be very contagious, and it's largely because of her that I'm where I am now.

AR: Did you meet Joan early in your graduate program at Minnesota? Within the field of educational psychology, how did your path begin to move in the direction of statistics education?

ME: I met Joan my very first term at the University of Minnesota. She was my teacher well before I started working with her. One of the first courses I took in the Department of Educational Psychology was called "Principles and Methods of Evaluation," and Joan was the instructor for that course. The following year, I applied to be a teaching assistant for one of our introductory statistics courses. Joan called me and asked me if I had an interest in eventually teaching my own section because she was looking for graduate teaching assistants who could ultimately become graduate instructors. At that time, I was just getting my feet wet as a graduate student and I really didn't know what career path I wanted to take. I thought it would be a good idea to get teaching experience, and this is how I started working with Joan. Although I stumbled a lot when I first started teaching, I soon grew to love it, and I felt I had finally found my niche. I continued to teach statistics (under Joan's supervision and mentorship) and serve as a teaching assistant until I graduated, and when I finished my degree, a position was created so that I could stay on as a lecturer in our department. I graduated in 2002, right around the time our Statistics Education program began.

AR: What were the student audiences for those first courses you taught: undergrad or graduate? Psychology students or various majors? Were these introductory courses?

ME: The first courses I taught were at the graduate level. One course I've been involved with consistently since I first started teaching is EPsy 5261: Introductory Statistical Methods. As you can see from the title, this is an introductory course, and it's not calculus-based. Some students take this as a terminal course but others take it with the goal of going on to our intermediate statistics course (also at the 5000 level), or to one of our doctoral-level statistics courses (at the 8000 level). Many of the students who take this particular course come from the College of Education and Human Development or from the School of Nursing, but it's not uncommon to have students come from other departments around campus as well (like Journalism, Mass Communication, Communication Disorders, Forest Resources, Music Education, Anthropology, etc.).

Teaching Style

AR: What was your teaching style as you were starting out in those days?

ME: Not good! I was very tentative at that time and unsure of myself, and it wasn't easy for me to get on board with the kind of structure Joan was using in the course (i.e., activity and discussion, with little lecturing on the part of the instructor). I wasn't used to that structure at all because most of the courses I had taken involved a lot of lecture. Also, when I did have courses

where there was more activity or group work, I didn't always enjoy that because I am more introverted. I naively assumed that because I didn't enjoy a lot of activity and discussion, my students would not either. Although it seems so obvious now, it took some time for me to accept that not everybody learns the way I do or enjoys the same things I do in the classroom. I also think that I was somewhat over-confident in my knowledge of statistics. I didn't prepare as much as I should have for class because, again, I was naïve, and I assumed that because I enjoyed statistics and felt I was good at it, I could easily teach it to others with little effort. I overestimated my ability to do that, and, because that subject came easy to me, I didn't appreciate how challenging it could be to others (nor did I understand all the misconceptions my students brought to the classroom about statistics).

AR: That's very interesting and brings to mind lots of follow-up questions. Let me start with this: I (perhaps naively) assume that people who have studied psychology, especially educational psychology, start out with an advantage as teachers because they have a professional understanding of how students' minds work and how they learn. Do you think there's any truth in my assumption? Do you think having studied psychology helped to prepare you for teaching in ways that elude people (like me) who have not studied psychology?

ME: This is a very interesting question, Allan, and a tough one. I feel that I can just speak from my own experiences here. I know a lot of great teachers who *do not* have a psychology or education background, and I know a lot of not so great teachers who do have such a background. I got interested in psychology (and eventually educational psychology) because I've always been fascinated with understanding people and how they behave and why they do the things they do. When I came to the Department of Educational Psychology to pursue my doctorate, my focus was in Learning and Cognition. I do think this helps me to some extent as a teacher because I think that it's very important for any teacher to appreciate what is involved in student learning and the kinds of difficulties students might have in the classroom. However, it's one thing to take a lot of classes that focus on educational psychology issues (or to read a lot of articles on topics related to student learning) and quite another thing to be in a classroom where you are expected to facilitate the learning of a particular topic. I think the really good teachers are the ones who have a passion for what they do and who genuinely want to see their students succeed and want to help their students succeed. These teachers recognize their own strengths and limitations and always strive for improvement. They have a strong understanding of the subject matter they teach but are also patient and recognize that even though they understand that subject, it might not come easy for everyone. They are not rigid in their approach and they are always willing to take risks in terms of trying to explain things in different ways or trying to create new activities that might make concepts more tangible for students. Becoming that kind of teacher, to me, takes a lot of practice.

I guess, put simply, I can't really say whether or not I had an advantage coming into the classroom based on my background. I know my background is what led to my interest in being a teacher, but I think so much of what I have learned along the way about being a good teacher has come from the interactions I've had in the classroom over the years with my students, and the interactions I've had with my colleagues. Those are not things that you can easily get from courses you have taken or books or articles you have read.

AR: Fair enough, thanks very much. You mentioned the importance of a strong understanding of the subject matter; what kinds of courses in statistics did you take? Many teachers of statistics had a very mathematical introduction to the field. I would guess that your background is more applied – am I right about that?

ME: Yes, my own background is more applied. At the undergraduate level, I took a variety of courses for my minor, beyond the introductory course. I took a course that focused on statistics in the social sciences (which was different from the general introductory statistics course that many of us were required to take). I also took courses in sampling methods and nonparametric statistics, and a couple of other courses that focused on understanding different statistical software packages and computing issues. At the graduate level, beyond the usual introductory and intermediate statistics sequence that was required for my degree program, I took courses in multivariate analysis and the design and analysis of experiments. I also took a seminar in hierarchical linear modeling.

AR: Let me return to your earlier point that you originally underestimated the challenge that many students face with regard to learning statistics. Now with the benefit of many years of experience, why do you think these challenges are there? And what are some of the important misconceptions that students enter your classes with?

ME: Well, first, let me clarify one thing I was trying to get across earlier. I think the term "misconception" can take on different meanings. We can talk about the kinds of misconceptions or misunderstandings students have when it comes to learning about particular topics or concepts (i.e., a misconception about a particular probability rule or about the meaning of the p-value), and we can talk about the misconceptions students have when they enter a statistics classroom (i.e., incorrect ideas about what the subject of statistics is all about).

When I talked earlier about misconceptions, I was alluding more to the latter meaning of the term (even though, like many instructors, I find that my students have certain misconceptions about particular topics or concepts we cover in the class). I think one challenge I found hard to overcome is that several of my students just didn't want to be taking a statistics course. They were not there because they wanted to be there, but they were there because they had to be there. Several students had very negative attitudes about statistics and were not very motivated to be studying that subject matter. Many equated the term "statistics" with "mathematics," and they assumed the class was going to be a math class in which they would be inundated with formulas and equations to solve. This, in my mind, was a big misconception, and it was something that was honestly surprising to me. Now, as I think back, I probably shouldn't have been so shocked by this, but, again, I loved statistics, and it was a subject that came easy to me when I was a student. I naively thought my students would be as excited to be taking a statistics class as I was when I was in their shoes, and I thought they would enjoy it as much as I did. It never dawned on me that even the thought of taking a course that could involve even the tiniest amount of math could be so anxiety-provoking and scary to some students, and the last thing I wanted was to create an atmosphere where students dreaded coming to class or felt nervous and anxious all the time. I wanted to empower all of my students and make them see that they could do it and that they could grasp the material.

I think a lot of these challenges are there because of past experiences students have had, and because of misunderstandings about what statistics is all about. I think this is getting better, especially now that more and more students are exposed to statistics much earlier in school, but I hear so many stories from students about the bad math experiences they had in high school, and I think they expect statistics at the college level to be a similar experience.

AR: How do you confront this misconception about what statistics is, and about what a statistics course should be?

ME: I've really worked hard to try to create a first-day-of-class experience for students that will both (a) dispel some misunderstandings students have about what statistics is all about, and (b) immerse them right away in an environment that is rich in activity and discussion. I want students to know from Day 1 what the course is and is not about, and I want them to get a good sense right away about how the course is structured. In many ways, you and Beth Chance have inspired me in this regard. Beth wrote a short article in 1998 in a Statistical Education section newsletter (http://www.amstat.org/sections/educ/newsletter/v4n1/v4n1.html#Chance) that gave me a lot of inspiration about how to structure my first day of class, and recently, Larry Lesser delivered an interesting webinar on CAUSEweb (http://www.causeweb.org/webinar/activity/2012-01/) about setting the tone on the first day, based on an article he co-authored last year here in *JSE* with Kerrie Kephart (Lesser and Kephart 2011). The paper you wrote with Beth and Else Medina ("Some Key Comparisons between Statistics and Mathematics and Why Teachers Should Care") is filled with great examples that showcase just how statistics and mathematics are different, and I share some of those examples with my students as early as the first day of the semester. I also try hard to emphasize the role that technology will play in our course (so that students know right away that I'm not going to be expecting a lot of hand calculations from them), and, in this regard, there will often be a first-day-of-class activity where we use some kind of technology (like an applet).

I used to be one of those instructors who spent the first day of class mainly going over the syllabus, but it dawned on me that doing that was not setting the right tone at the start of the semester. So much of what is in the syllabus can be summarized or highlighted very briefly in class, and students can read through the details outside of class. Now, I spend only the last few minutes of the first day briefly highlighting key points in the syllabus. All the rest of the time is spent engaging students in activity and discussion because I want them to see right away that is what the course is going to be like. As a graduate student, when I first observed Joan teaching, I noticed a first-day-of-class activity she used called "Meet and Greet." In this activity, students are asked to meet a handful of their peers and gather information from each peer (e.g., the peer's name, field of study, favorite color, miles lived from campus, etc.). I love this activity because it immediately gets students moving around and talking with each other, and they each gather some rich data that we can then talk about and informally analyze. I still use that activity to this day. I especially like one question that Joan asked her students to ask each other during this activity: "What is the one word that comes to mind when you hear the word 'statistics'?" This is the one question I always make certain to include when I use the activity, and I like it because I think that right away, it allows students to see they are not the only ones who are a bit nervous and anxious about the course. It's not uncommon for the one word students utter to be something like "fear," "anxiety," "dread," or something else that might have a negative connotation. When

we are de-briefing and I ask students to share the words they heard as they were "meeting and greeting" with the whole class, this gives me another opportunity to try to make them feel more comfortable with how the course will be structured, and to confront any possible misconceptions they might have about the course.

I like the "Gettysburg Address" activity from *Workshop Statistics* and often use that the first day as well, and I sometimes even introduce the Monty Hall problem as a way of trying to show students that sometimes, their intuitions or personal theories about how the world operates might not be correct and gathering data can help us better evaluate those theories. I also like to bring in a lot of reports from the news or examples of television commercials where particular claims are made, or where statistics might be used in appropriate or inappropriate ways. I do this beginning on Day 1 because I want students to see that even if they have no intention of ever taking another statistics course or formally analyzing a data set they have collected, a knowledge of statistics will still be important when it comes to being about to critically evaluate the data we are bombarded with on a daily basis from all kinds of sources. I hope that this motivates my students and helps them better see the relevance of the course in their personal lives.

AR: Thanks very much. Your students must realize from day one that they are in for an experience that is much richer than doing calculations and derivations. I want to back up and ask a question that came to mind earlier. You said that when you finished your degree at Minnesota, a position was created that enabled you to stay on in the Department of Educational Psychology as a lecturer. Was the decision to accept that position a no-brainer for you? Did you pursue other positions as well?

ME: Yes, I do hope they realize this! As for staying on as a lecturer after I graduated, the position wasn't a sure thing right away. I have Joan to thank immensely for that because she really lobbied for that position, and I'm very grateful that she did that.

As I was getting close to finishing my degree, I wanted to keep all options open, and there was a part of me that still wasn't 100% certain of exactly what I wanted to do or where I might fit in. I always felt that I had a bit of an unusual background because I studied Psychology as an undergraduate and as a Master's degree student, and then I obtained a Ph.D. in Educational Psychology. Along the way, I got a lot of teaching experience, but it was all in a subject that I don't have a degree in. Thus, even though I knew I wanted to continue teaching and hoped to be able to teach statistics, I didn't feel I had the background that would allow me to apply for positions in Statistics departments. My advisor felt I should apply for tenure-track positions, and most of the positions I felt qualified for were either in Psychology departments or Educational Psychology departments (and the latter positions were mostly at research institutions). I wasn't convinced that I wanted a job that would involve a lot of research, but I decided to cast the net widely and I applied for many positions. I had one face-to-face interview at the University of Utah and a couple of phone interviews, but they didn't lead to job offers.

One great thing that came from that process of applying for jobs is that I started to realize that the perfect job for me was one that would mostly involve teaching since that is what I'm passionate about, and, ideally, it would involve teaching a subject that I'm passionate about. When I was offered a position in our department, I didn't have to think twice because I knew it

was the right fit. I get to do what I love, and even though I am not fond of Minnesota winters, I love being at the University of Minnesota, and I have some amazing colleagues and students to work with. I'm a strong believer that everything happens for a reason, and when I think back to all that has happened in my career over the last 10 years, I know I made the right choice and that I'm where I should be.

Teaching Online Courses

AR: That's a terrific feeling to know that you are where you are supposed to be, doing what you are meant to do. Let me shift gears a bit and ask about a topic that you are well known for: online teaching. When and how did you come to teach your first online course?

ME: In 2003, Joan and I met with our Department Chair, one of the Deans of our college, and also our college director of Academic Technologies to talk about the feasibility of designing online versions of two of our introductory statistics courses (our undergraduate-level course and then the graduate-level course that I had been teaching). We often got requests from students who wanted to learn statistics via "independent study" because they could not be on campus on a regular basis, or they wanted for us to be able to send instructors to other locations (like Rochester, MN) to teach statistics, and that wasn't always feasible. We thought online courses might be good options for these students and others who, for whatever reason, were unable to enroll in our face-to-face courses. The idea to create and teach some online courses was very well received, and I was able to get some funding from the department to work on developing these courses during the 2003-2004 academic year. I then taught my first online courses in the fall of 2004.

AR: What were the biggest challenges that you faced in developing online courses?

ME: I think the biggest challenge for me was that I had never been an online student, nor had I ever seen a model of a good online course. I knew what kind of online course I wanted to create (i.e., one very rich in activity and discussion), but I didn't know how to do it. I didn't feel like I had a nice road map to guide me. At that time, I was still on a dial-up connection at home, and it took forever to download materials from the course site and upload new materials (if I was working from home). This was tough, and I realized that if I was having so many problems, my students would likely have problems as well (since I knew many of them had dial-up connections as well). I had to think very carefully about what I put up on the site and what types of materials I was expecting my students to work with because I didn't want them to become increasingly frustrated if they had difficulties accessing important course content.

A very big mistake I made when I first got started is that I underestimated how much time it would take for my students to work through certain activities and discussions. What can take just a short amount of time to accomplish in a traditional classroom can take several hours to accomplish online unless all students are able to be online at the same time (and to me, requiring that all students be online at specific times really takes away some of the flexibility I feel should be a part of the online course experience).

Fortunately for me, I had someone to work very closely with as I was developing my first online courses. I worked with Yelena Yan. She is an Instructional Designer within our college Academic Technology Services unit. She is amazing. Yelena and I talked very carefully about every aspect of the course, from the way the weekly modules would be structured to how we might use assessments and discussion forums. Yelena had been a student in two of my courses, so she knew my teaching style, and she knew it was important to me to create an online environment where students had many opportunities to work together and learn from each other. Yelena initially built my first online sites for me, but I was able to watch what she did and how she did it so that I could eventually build my own sites.

AR: You've been teaching online courses for several years now and have published on the topic. Do you think you've succeeded in creating online courses that are rich in activities and discussion? What's the key to achieving those goals?

ME: I would say the answer to this is yes and no. I do feel I've accomplished a lot in terms of getting students involved in activity and discussion, and I have attempted to write about and share some of the things I have done (e.g., Everson and Garfield, 2008). I've been thrilled with some of what I've seen and learned from my online students as they discuss different topics, but I still feel there is so much more I can do and explore. I always feel the need to make things better and to experiment, and I'm always sure there are things that can be improved upon.

When I first started teaching online, I was quite inspired by a short article I read by Klemm (1998) called "Eight ways to get students more involved in online conferences." He outlined different ways of motivating students to engage in discussion in the online course, and I followed (and still do follow) many of his suggestions. I feel one key to getting students involved in activity and discussion is to make tasks manageable for students. It can be very overwhelming if you have a large class and you expect students to engage in whole class discussion and to try to wade through hundreds of postings in an online discussion forum. I break my students into smaller groups of about four to six students, and they work together in those groups on a variety of small discussion assignments throughout the semester (or at least for part of the semester since I recently started to change the discussion groups mid-semester). Each assignment might involve four to six questions that I want students to talk about together, and for each assignment, the groups are asked to elect a leader who will summarize the group discussion by a particular deadline. I've found that having deadlines is very important, and requiring a summary means that (hopefully) students will not wait until the very last minute to get started on the assignment. Students typically have several days to complete each assignment, and they work asynchronously (meaning they do not all have to be online at the same time since they can post their thoughts on discussion boards). In some classes (particularly the undergraduate course I teach), I might also require that students post their initial answers to the discussion questions well ahead of the discussion deadline just to ensure there is ample time to really "discuss."

I try to come up with discussion questions that actually lend themselves to discussion. I stay away from questions that might just have one correct answer because if all students get that answer right away, they tend to feel they have nothing to talk about. Many of the assignments I enjoy the most are ones where students might critique a published study or a media report and then try to come up with a new experimental design in order to answer a particular research

question, or I might give students a rich data set and ask each student to explore a different variable in the data set. Asking students to come up with their own examples to explain different topics or concepts also seems to lead to a lot of rich discussion.

I create detailed guidelines for students that provide examples of how they should work through discussion assignments and what it means to reflect in a meaningful way on what other students have shared during discussion. I also make it very clear how the discussions will be graded, and I grade based on participation, not based on whether answers are right or wrong. I tell my students that I want them to take risks in terms of explaining their understanding to their peers, and I want them to feel comfortable doing this.

I personally feel very strongly that one key to getting students involved in activity and discussion in the online environment is for the instructor to be present and to be a participant (to some extent) in activity and discussion. When I first started teaching online, I felt I had to remain hidden, and I worried that if I participated in discussion, I would stifle discussion, or students would learn that if they waited long enough, I would be there to share the "right" answers with them. I didn't want to create that kind of environment in my courses. I wanted my students to see their peers as important sources of information, and I wanted them to get into the habit of trying to teach each other. So, I rarely ever posted anything as my students were working through discussion assignments. When I looked at my course evaluations, I saw that students wanted me to be move involved, if only to let them know they were on the right track, and I started to re-think how I could participate in discussion in a meaningful way. I now make it a point to check in with my students on a regular basis and to post at least one time in every group, during every discussion assignment. I hope that my participation can model for students how I hope they will respond to each other, and I also hope that I can challenge students by asking them questions and getting them to think more deeply about content. Sometimes, I might be able to steer them in the right direction if it seems they are having difficulties, and other times, I might need to provide some direct instruction if it seems there is a lot of confusion or uncertainty.

I recently thought of an analogy that explains how I see discussion activities in my online courses, and how I perceive my role as the instructor. I think of my students as being like tight-rope walkers. I am asking them all the time to take risks when it comes to explaining their understanding of concepts and to do something that I know is quite scary for many of them, just like walking on a tight-rope can be risky and scary (I would assume). However, I want them to know there is a net below (me) that will catch them if they fall, and, hopefully, that will give them the courage to keep trying.

AR: Boy, once again several follow-up questions come to mind. Your response is about stimulating discussions rather than implementing activities. Can you give an example or two about how you go about incorporating effective activities into an online course? For example, many instructors use an activity (or several) based on having students examine samples of M&M candies in class; is there anything comparable that can be done with online students?

ME: Yes, you're right. I think I tend to see discussion and activity as being intertwined because when students are discussing material, I feel they are actively engaging with that material, and

several of the discussion assignments I use do involve a certain amount of activity. Students might be asked, for instance, to use an applet and then to talk about things they learned from using that applet with their peers. Or, they might be given a data set and asked to explore a particular variable or set of variables, and discussion might then ensue about what they discovered and what kinds of conclusions they might be able to draw based on their analyses.

I wish I could say that I've found a good way to use things like M&M candies or Reese's Pieces candies in my online courses. I think it's harder in the online environment to use different manipulatives as part of an activity, especially if it would be up to students to purchase or somehow gain access to these materials on their own. I think, in place of using manipulatives, we have to get creative in our online classrooms, and we have to think of alternatives. As an example, I have an activity I love to use in the classroom that involves an Oreo cookie taste test (to see if students can tell the difference between regular and low-fat Oreo cookies), and although I can't do the taste test with my online students, I have tried to adapt that activity for use in the online environment. The online students cannot participate in the taste test, but they can talk about how they might set up a taste test, or they can evaluate a set of data that was collected from a classroom section of the course.

A while ago, I became very interested in trying to figure out ways we might be able to take some of our more hands-on classroom activities and create tools (like applets) that would allow our online students to engage in some of those activities. We have a program in our college where each spring, instructional designers from our Academic Technology Services unit will work with faculty on different technology-related projects. I applied for this program several years ago and I worked with a new media developer to create a couple of tools that I thought we could use online to try to replicate certain classroom activities. One tool—which we called Sticky Centers (http://projects.cehd.umn.edu/EdPsy/sc/)—was meant to take the place of a classroom activity we used to use that involved Post-it Notes. Students would be given a stack of Post-it Notes and would place notes in different places along a number line as they reasoned about how the mean and median would change as notes were placed in different locations. I thought it would be so neat to have an online tool where students could place virtual Post-it Notes in different places, and we were able to create that, along with an activity that our online students worked through independently and then discussed as part of a discussion assignment. Once the Sticky Centers tool was finished, we attempted to develop another tool based on George Cobb's famous "Gummy Bears in Space" activity. I wondered if we could somehow launch virtual Gummy Bears into space, and our new media developer took this idea and created something really cool. We got a good start on this project (http://projects.cehd.umn.edu/EdPsy/gb/), but, beyond trying to pilot test this tool with some students in a regular classroom setting, we never used the tool with our online students. Part of this was because our curriculum changed a bit, but a bigger reason is that there were still many things I was hoping we could do with this tool and improve upon, and by the time we were ready to move forward with the project, the new media developer who helped create the Sticky Centers and Gummy Bear tools had left his position, and nobody with his skill set came along to replace him. I'm hopeful we can one day return to this, however.

AR: I (and many others, I'm sure) can attest to finding it challenging to implement good discussions and activities in face-to-face courses, so I greatly admire your efforts to do this effectively in the more challenging environment of an online course. Aside from the advantage

you mentioned of accommodating students who cannot commit to being on campus at certain times, do you find any other benefits of online courses, any other ways in which online courses might provide better learning experiences than face-to-face courses?

ME: You know, I've thought about this a lot, and I don't feel I have any evidence to back up that online courses would provide better learning experiences than face-to-face courses. I feel they provide *different* learning experiences, but I don't know that you can say one experience is better than the other. I think it depends a lot on the student and his or her motivation, and also on how the course is structured and taught.

To really succeed in an online course, you have to be self-directed. You have to be committed to managing your time in an effective way to get things done, and, if being organized is a challenge, you may struggle a lot if you continuously put things off until the last minute, right before a deadline. I've had several online students over the years who I think would have benefitted more from being in the classroom. In a classroom environment, you get more immediate feedback when you have questions, and there is a visual and verbal dynamic that you cannot easily replicate in the online environment. Plus, if you are taking the course in a face-to-face environment, there is a set time (or times) every week when you need to be in the classroom working on and thinking about statistics. If you take an online course, you have to set those times for yourself, to a certain extent, and that can be quite difficult for some students.

With that said, I've often wondered if there might be a benefit in the online course in terms of opportunities students might have to think and reason through content that is not always there in the face-to-face course. For instance, in my face-to-face courses, I often break students into small groups and ask those groups to work together on and discuss different activities. I will then walk around the room, and I'll hear bits and pieces of different conversations, but I never hear everything. Also, I will often witness different levels of participation in these groups. Some students are very shy and quiet and may say very little; other students take charge and might even dominate a group. They may be all working through the activity together, but I don't require the classroom students to participate in a particular way as they are talking together, and so I'm never quite sure if all students are as engaged as they could be. In the online environment, I do require that each student participate in discussion in a particular way, and I do this because I found from experience that if I wasn't explicit about how students should work together, some students would assume that discussion was optional and just wouldn't participate at all. I felt I needed some way to motivate everyone to participate in online discussion because, in the online environment, students don't have that physical presence of the instructor as the motivation to engage in activity and discussion.

I've wondered, because I require each student in the online course to work through an activity on his or her own first and then share his or her own thoughts on the discussion questions (before responding to what others in the group have shared), if the online students might get something different out of the discussion than students in the classroom. I wonder if they feel there is more equity in the discussion in that each student has a say and gets ample opportunity to put forward his or her own points of view. Again, I haven't tried to study this in a systematic way, and I know there are ways I could probably better structure the classroom environment to achieve some of what I get to do online. I've just always been curious about it.

I know for me, as the instructor, I've found a great benefit in that I feel I get to engage in ways with my online students that I don't get to engage with the classroom students. I get a window in which I can look into each online discussion room, and I can witness each discussion from start to finish. I can't possibly do that in the classroom, and I always worry that something will be said in a discussion (in the classroom) that I should have caught and discussed with the whole class (i.e., some kind of misconception or misunderstanding). I can easily catch those things in the online environment, and I find that I have opportunities to respond to and connect with each individual student that I don't feel I get in the classroom. If I want, I can provide each student in a discussion group with individual feedback along the way as they are discussing. I don't always get to do this because of the number of students in my online classes, but I like that I have that opportunity. I feel I get to know each student's "voice" more in the online course because I get to witness how he or she talks through different concepts and ideas and I get to witness how that changes over the course of the semester. I don't feel I get that in the classroom.

I also really like (perhaps because I am rather shy) that the online classroom gives a forum for those quieter students to really come alive and express themselves. I still remember an encounter I had with a former student. She had taken two online courses from me and she was a top student, and I loved how eloquent she was in her discussion postings and how she often went above and beyond when it came to participating in discussion. I told her this at the end of the second course she took with me, and she said that she is actually very shy and that if she had been in a classroom setting with me, I probably wouldn't have recognized her because she would have barely said a word. I liked that she got a voice in the online environment, and I often wondered if that affected how she learned the material. Would she have learned just as well in the classroom? I don't know.

AR: That's a very nice story about this shy student's experience. It's clear that you invest a great deal of time in your online courses, for example by keeping up with and contributing to students' discussions on top of all the set-up work involved with designing the course. I think there's a perception among some faculty and students that online courses are essentially self-run and self-taught. I've heard some faculty express concerns that an online instructor might set up the course, press the button for it to run, and then assign grades at the end. And some students have told me that they've taken online courses where they have never had a single interaction with the instructor or a fellow student. Do you think these stories are anomalies, or are these genuine concerns about misuses of online teaching? And do you think the potential for poor, unengaged online teaching is any greater than the potential for poor, unengaged face-to-face teaching? (Boy, I feel awkward about interjecting a question about poor teaching into our conversation, but I want to give you a chance to address these concerns I've heard about online teaching.)

ME: No, I don't think these are anomalies, Allan. I have heard similar stories from students, and it makes me feel very sad. I do think there are instructors who just don't have any idea how to work in the online environment, or have misconceptions themselves about online learning, or were perhaps forced to teach online because nobody else wanted to do it. But then, I also think the way you teach in the online environment depends a lot on how you have structured your course and what your goals are, and what you value as an instructor. If you teach mostly just a

lecture-based course and you believe that students learn simply from reviewing lectures, I suppose you could just throw all your materials online and have students watch videos or read through lecture notes at their own pace and then complete assignments and assessments with little instructor intervention (other than sharing feedback on said assignments and assessments). I don't believe for one minute this is how things should be done, but I think there are instructors who operate this way.

I've had many students come to my online course with the notion that the course will simply be an "independent study" where they will work on their own (without any interaction with any other student) and they will work at whatever pace is comfortable for them, so long as they complete everything by the end of the semester. When I hear things like this from students, it makes me wonder about other online experiences (or regular classroom experiences) they might have had before my class, or why they think the course would be set up that way. As you know, I feel interaction with peers is extremely important, and I also feel that I need to give my students feedback along the way about how they are learning material. It would be very challenging for me to do this if assignments were all turned in during Week 15 of the semester. I also feel that in a statistics course, it's important that you build a foundation before you begin delving into more advanced topics, and if you try to cram a lot into a small amount of time, I question how much learning will take place. I just can't fathom an online course that doesn't have weekly deadlines and some kind of consistent structure from week to week, but I've heard stories from students about online courses they have taken that seem to have little to no structure. I just hope, as online courses are becoming more prevalent, that this is changing.

You ask if the potential for poor teaching might be greater online than it would be in a regular face-to-face setting. This is a good question, and honestly, I don't know. As I mentioned earlier, when I first started teaching online, I didn't have a model for what the online course should look like since I had never been a student in an online course. I imagine many other online instructors are in the same boat. We all grew up with face-to-face courses and have seen many examples of how they can be structured, but we have much less (if any) experience with online instruction, and for some, I assume this can be a recipe for disaster. I personally feel that unless you are willing to make the time investment it takes to be a good online instructor and to learn about what it takes to teach online, you might run into problems. Also, I strongly feel that you have to have a certain comfort level with working online to be a good online instructor. If you loathe responding to email or don't want to take the time to stay on top of email or discussion that is going on in your online course, you are not going to be doing your students any favors. I've started to feel recently that it should be mandatory for all online instructors to take a course (perhaps a course all about online teaching) that is completely online, just so they can experience what it's like from the student point of view. I suppose for a variety of reasons that may be impossible, but I've often wondered if it would help.

AR: That sounds like a great idea. Everyone who teaches in a classroom has had considerable experience as a student in a classroom. I have one last (I think) question about online teaching, and it concerns another potential abuse. How do you ensure in your online courses that your students are actually the ones doing the work, particularly on exams but with all aspects of the course?

ME: I think you have asked the million dollar question, Allan. Whenever I tell anyone that I teach online, one of the first questions I get tends to be about cheating (i.e., "How do you know your students are not cheating?"). This makes me mad because I don't feel it's fair to assume that just because you cannot see your students, they are more likely to be dishonest. I think many of us have witnessed inappropriate behavior in the face-to-face classroom, and I think even in that situation, you can never be 100% certain students are doing their own work (especially when many assignments—like homework assignments—are completed outside of class).

With that said, this is definitely something I have struggled with over the years. I constantly think about what I do and whether I could be doing a lot more to prevent academic dishonesty. I haven't witnessed a lot of academic dishonesty in my own online courses, and this makes me feel that it's not as rampant as some might think, but, of course, I can't draw sweeping conclusions based only on my own experiences. I know of many online instructors who require their students to come to campus to take exams in proctored settings, or who require the students who cannot come to campus to find proctors. We don't currently have a system in place that I know of at our university (like a testing center) where we could easily administer proctored exams, and I've heard stories from some instructors about how there can be problems when it comes to requiring students to find their own proctors (i.e., exams might not be returned to the instructor in a timely manner, you might not be able to verify the proctor is who he/she claims to be, etc.). For these reasons, in my own courses, I do not require proctored exams, but I try to do a lot of other things that I hope will discourage students as much as possible from being dishonest. Am I able to ensure that all students are behaving in an honest way? No. But, are any of us able to say this with 100% certainty, even if you have a lot of rules and procedures in place to prevent this? I'm not so sure. I think a student who is inclined to be dishonest will find a way to do so, no matter what the setting.

One thing about my classes is that I use a variety of different assessments. Because of this, I hope any one assessment won't be so "high stakes" that students will feel it necessary to cheat. I have clear guidelines about academic misconduct and the consequences of this misconduct on my syllabus, and there is an academic honesty statement that I ask my students to respond to when they submit an exam (or before they take an exam) where the student pledges he or she is doing the work independently. I ask mostly open-ended questions on my assessments where students have to explain their answers, and because I use a lot of discussion in my classes, I can gauge whether an answer seems to correspond with other writing or other work I have observed come from a particular student. I would think it would be quite challenging for one student to talk another student into doing ALL work for him or her in my class (i.e., working through discussion assignments and all other assignments), so I'm inclined to believe each student is who he or she says.

I think of my exams as being like miniature take-home exams that you see a lot in regular classroom settings, so I feel the online course is no different from the classroom-based course where instructors allow students to work on take-home exams (but then I know there are debates about whether or not that is appropriate as well).

I feel there are many things the online instructor can do to try to prevent academic dishonesty. Even if you have a much larger class and you want to use multiple-choice questions to cut down

on the grading burden, you can randomly order questions for students (or even randomly choose questions for students if you have a large enough item pool to work with), and you can allow students just a short amount of time to work through assessments. Maybe it's just me, but there is something that doesn't sit well when I think of the length that some go to in order to "police" their students and make sure the students are being honest. I know some instructors require students to purchase webcams and videotape themselves as they are taking exams. I worry about resorting to this because I don't want to set up an atmosphere in my classroom where students come to believe that I assume right from the start that they are going to be dishonest. But, this is just me. I have friends who feel very strongly that you do need to "police" things in this way and that not doing so is not fair to the students who are being honest, and I get that.

I think we could debate about this quite a bit!

One article that I found that was very enlightening to me about this subject comes from EDUCAUSE Quarterly. It was written by Christe (2003) and it's called "Designing online courses to discourage dishonesty." I would highly recommend that article to anyone who wants to learn more about this important topic.

Using Social Media for Teaching Statistics

AR: You said earlier that you are very comfortable being online. Do you use social media for teaching purposes? If so, how do you think this has the potential to benefit student learning?

ME: Yes! People who know me well know that I'm very fond of using social media—especially Facebook—and I've tried experimenting with ways to bring social media into my classes. Part of my initial interest in doing this was that I observed my students using social media a lot. We used to teach some of our face-to-face courses in a computer lab, and I would catch my students on Facebook quite often during class (or shortly before class started). It made me wonder if using a tool (like Facebook) that I knew my students enjoyed might better motivate and engage them, and I definitely think being motivated and engaged is one key to student learning.

I have an assignment I created in one class where students can use social media, if they want to, in order to get credit for the assignment. The assignment is more of a statistical literacy type activity where students can either (a) critique an article (that uses some of the statistics they have learned about in the course) from a field of their choosing, (b) share, discuss, and critique media reports they are finding in a special Facebook group I have set up for the class, or (c) create a short YouTube video that is meant to showcase some of what they have learned in class or explain a concept/idea to someone else. I've been using this assignment now for a couple of years, and each semester, I would say that between a quarter to a half of the students in a class will choose the Facebook option. Most of the rest of them will critique an article, and only a small number will usually go the video route. I often wish I would get more videos because it's so much fun to see the creative things students will come up with. Last spring, one student actually dressed up as a "Stats Ninja" and videotaped himself as he tried to explain different statistical ideas. It was hysterical.

I've started to delve into some of the literature related to using social media for educational purposes, and although there are many great examples out there of how instructors from a variety of disciplines have tried to use things like Facebook, Twitter, and YouTube in their classrooms, there is clearly quite a bit that remains unknown about just how this might impact student learning. I'd love to study this more systematically, but, personally, I don't feel comfortable requiring that any of my students use social media if they don't want to. I think it has to be a choice on their part.

AR: Tell us a bit about how you use Facebook professionally, whether it's finding interesting articles to serve as class examples, or exchanging teaching ideas with colleagues, or …

ME: I would say that the way you have outlined using Facebook is how I use it professionally. I have personally found Facebook to be a great way to connect with and get to know so many individuals within the Statistics Education community. I used to go to conferences and feel extremely isolated because I didn't know people and my shyness made me horrible at networking. Now, I find that I go places and know so many people, largely because of connections that have been formed through social media. I think, through social media, that you get to know so many interesting things about people that wouldn't normally come up in regular conversation you might have when you see them in professional settings. I like to share interesting links I find on Facebook to news stories that relate to distance education or technology, and I also often share links to articles that I think could be used in the teaching of statistics (i.e., articles that might report things in misleading ways or cover topics I think might be interesting to students). I often use social media to write about or express teaching challenges or dilemmas I face because I know a lot of my friends face similar challenges, and I love that we have this way of supporting one another and commiserating with each other. One of my good friends and collaborators, Ellen Gundlach, is actually someone I got to know largely through social media, and we often joke about that. She is at Purdue, and we met at the United States Conference on Teaching Statistics (USCOTS) in 2009 because of our mutual interests in distance education. We then became friends on Facebook and started sharing activity ideas. We both like to use articles from the news media in our teaching, and often, one of us will find an article and the other will then create an activity using that article. Some of my closest friends now in the Statistics Education community are people I got to know mostly through social media, and the power of social media (in this regard) continues to amaze me.

AR: What are your secrets to finding interesting examples and datasets? Which websites or other sources do you like to peruse?

ME: I'm not sure I have any great secrets to share. Sometimes, I will hear news reports on the radio (I have a long commute to campus so I am listening to the radio a lot) or on television, and I'll track down the original sources. I belong to lots of email lists that relate to teaching and I often get a lot of ideas from things people post there. I try to check different online news sites on a daily basis if I can, or at the very least on a weekly basis. I've found some great things on www.sciencedaily.com and also on www.nbcnews.com and www.cnn.com. The LA Times has a section called Booster Shots (http://www.latimes.com/health/boostershots/) where I have found many interesting things, and I also frequently look at articles posted on NPR (www.npr.org), or in Time Magazine (www.time.com). If I really like an article and I feel I could use it as part of a

class activity, I will always try to locate the original source (if the article is a media report), and sometimes, I might then contact the authors to see if they have any data from the study they might be able to share with me. I've also found a lot of interesting examples based on things my students have brought to class and shared, or based on links my students have posted in our Facebook group. I think my students learn early on that I'm a junkie as far as interesting news reports about statistics are concerned, and it's always exciting to me when they start getting excited about what they are seeing or hearing about in the news and how it relates to what they are learning in the classroom.

Preparing Teachers of Statistics

AR: I understand that you teach a course about becoming a teacher of statistics. How did this course come to be, and what is the student audience?

ME: This was a course that Joan originally developed for our Statistics Education program. Several years ago, we talked about trying to create an online version of the course because we felt the course was unique and that we might be able to reach a bigger audience if students from all over the country (and even outside of the country) had opportunities to enroll in the course. This is how I got involved in teaching the course. I sat in on the course one semester when Joan was teaching it so that I could learn more about the course and how to structure it for the online environment, and then I took over teaching it when it became a fully online course in the spring of 2008. The course is generally taught once each year, and I taught four online sections (beginning in 2008). Just this past spring, we brought the course back into the classroom, and Joan was the lead instructor and I was her co-instructor. We really enjoyed the co-instructor model, and we also liked having the course in a face-to-face classroom setting again, so this may be the direction we go with this course in the future. I would say the course is designed mostly for individuals who know something about statistics and either plan to teach statistics in the future or are currently teaching statistics and want to learn about ways to improve upon what they are doing. We've had a wide variety of students take this course over the years, from graduate students in several different areas (e.g., Curriculum and Instruction, Educational Psychology, Nursing, Kinesiology, Psychology, Statistics, Veterinary Medicine) to AP Statistics teachers and faculty at two-year colleges or four-year institutions.

AR: Because so few teachers of statistics receive much guidance in how to teach the subject well, I suspect that many of us would have loved to take such a course in graduate school. Those interested in your course can read all about it in the JSE article that you and Joan wrote (Garfield and Everson 2009). But for now can you give us the highlights of what you've learned about becoming an effective teacher of statistics based on your experiences with this course?

ME: Oh my goodness…This is a tough question! I think for me personally, this course has been a wonderful introduction to the Statistics Education community and to scholarship in Statistics Education. I sometimes feel there is still so much I don't know about the history of Statistics Education, and I learn something new each time I teach this course. Although I have taught the course several times now on my own, I still work closely with Joan when it comes to deciding on the structure of the course, the kinds of assignments and activities we'll include in the course, and the readings we'll be assigning to our students. Because there are always new advances in

the field, we change the course each time we offer it, and even if we use some of the same readings, I find myself noticing new things each time I read through them, and coming away with new activity ideas. There are so many great teaching resources out there that I don't think many people know about (like online journals, resources available through the ASA website, CAUSEweb, books, etc.), and I got much better acquainted with many of these resources through my work with this course. I also noticed that our students were often surprised by the many great resources that are out there. They learned quickly that as teachers of statistics, they didn't have to re-invent the wheel and come up with brand new activity and assignment ideas from scratch. I think this can be a very comforting thought when you are first starting out.

As I reflect on my experiences with this course, I think one of the biggest things I've learned about becoming an effective teacher of statistics is the value of collaboration. Joan and I have worked so closely on this course over the years, and I like to think this has made the course better (and made me a better teacher) since we each bring unique perspectives to teaching, and we have different strengths and different experiences to draw on. It helps to have different viewpoints when it comes to designing activities and assessments, and I like being able to bounce ideas off of someone else, or offer suggestions where I can when they have ideas to share. I've never felt that I had to "go it alone" when it came to teaching, and I think it's important that all instructors feel like that and have those opportunities to get feedback on their ideas and to brainstorm new ways of engaging students and assessing student learning. I also strongly feel that even if you don't have opportunities to collaborate with your colleagues, it's always possible to find other educators who share your interests and to create your own support network.

Plans for *JSE*

AR: You mentioned scholarship in Statistics Education, and that provides me with a segue to a question that I was planning to ask later but will ask now instead. As I mentioned earlier, you're the incoming editor of the Journal of Statistics Education. *So, can I ask you for your views on what Statistics Education entails? I don't know if I'm asking for a definition, or for your thoughts on what "counts" as Statistics Education, or maybe for you to discuss any differences you see between research in Statistics Education, scholarship in Statistics Education, and just wanting to improve teaching and learning in Statistics Education? Let me put it like this: You and I are both putting Statistics Education in capital letters to emphasize that this really is an academic discipline, so what the heck do we mean by the term Statistics Education? Of course, I can't ask you what* we *mean, so I'll just ask what* you *mean.*

ME: Another good question, Allan. When I think of the discipline of Statistics Education, I think in broad terms about a discipline whose focus is on the teaching and learning of statistics at all levels, in a variety of different contexts (i.e., in classroom settings, in the workplace, etc.). As Statistics Educators, we want to better understand how individuals learn statistics so we can determine the most effective ways to teach statistics in order to maximize the learning of statistical content.

I am often careful about how I use the terms research and scholarship, because I see these terms as meaning different things when it comes to Statistics Education. Research in Statistics

Education involves focused study that aims to answer a particular question (or questions) that relate in some way to the teaching and/or learning of statistics. To answer the research question(s), an experiment might be conducted, or a survey instrument might be constructed, or other research methodologies might be used, and data will then be gathered and analyzed. The results of the analysis will then be evaluated in light of the original research question. Those who are interested in learning more about Statistics Education research or finding ways to get involved in such research might want to look carefully at the Research section on CAUSEweb, and in particular at the following site: http://www.causeweb.org/research/gettingstarted/faq.php. When I think about scholarship, I think about knowledge that results from study or research in a particular field. So, research (in my view) is a part of scholarship, but scholarship can also include anything that serves to extend our knowledge of a field. Earlier in this interview, you cited an article from JSE that Joan and I co-authored about our Becoming a Teacher of Statistics course. I think of this as scholarship because it adds to our knowledge about Statistics Education, but it was not a research study. Mills and Raju (2011) recently published an article in *JSE* that reviews literature from the past decade about online instruction in statistics. This too is scholarship in my mind but not a research study.

AR: I know it's still many months until you take the helm as editor of JSE*, but do you have any plans beyond continuing the high-quality work of your predecessors?*

ME: Yes, first and foremost, I definitely want to continue the high-quality work of all of the previous editors (Jackie Dietz, Tom Short, Bob Stephenson, Bill Notz, and John Gabrosek). I feel I have some very big shoes to fill!

I do have some ideas for new things I would like to try with JSE, but I must admit that I have not yet shared these ideas with many people, so it could be that I'm the only one who is excited about them!

I have enjoyed reading John Gabrosek's "Blast from the Past" as he begins each new issue, and I've often wondered if that might become a regular feature. For example, perhaps in each issue, we could have a column (maybe in the "Teaching Bits" section) where an educator talks about an older article from JSE that really inspired him or her in some way, or that led him or her to try new things in the classroom or to get involved in Statistics Education research or in the Statistics Education community.

At the last United States Conference on Teaching Statistics (USCOTS), I enjoyed the debate you and Beth Chance had (as plenary speakers) about the next big thing. This made me think about another feature we might add to *JSE* that is more along the lines of a "point-counterpoint" piece where two statistics educators debate or argue a particular point and share two different opinions or viewpoints. I was also very inspired at the last USCOTS by Rob Gould's talk, and I very much like his 2010 paper "Statistics and the Modern Student." This has made me think a lot about the newer kinds of data that our students are exposed to before they come to our classrooms, and I can't help but question how the current emphasis on "big data" could be incorporated into the Data Sets and Stories section of *JSE*. After many years of great leadership as the Data Sets and Stores editor, Dex Whittinghill is stepping down, but I'm happy to report that Nick Horton from Smith College will take his place, and I look forward to the opportunity to

work with Nick in this capacity and to think carefully about where we can go with that part of *JSE* in the future.

I want to continue to involve others in the work we do for *JSE*, and I hope to bring aboard several new Associate Editors during my term as Editor. I also look forward to working with our many returning Associate Editors and getting to know them better. For me, being an Associate Editor was such a valuable experience, and I like the thought of being able to mentor others who have interests in editing. Also, I strongly feel it's important to get the word out about *JSE* and to make sure as many people know about it as possible. Because of my own interests in social media, I've wondered if it might be useful to have a Twitter feed for *JSE* where new articles and new issues could be announced. Also, would it make sense to set up a Facebook page for *JSE* where we could announce the publication of new articles, and where statistics educators could have opportunities to discuss and comment on the work that is being published in *JSE*? These are things I definitely want to look into.

These are just a few things I've been thinking about lately. ☺

Chairing Conference Programs

AR: These sound like great ideas. I'll bet that you're not the only one excited about them. You've also had a busy 2012 in terms of conference leadership. You served as program chair for the first Electronic Conference on Teaching Statistics (eCOTS) and of the Section on Statistical Education for the Joint Statistical Meetings (JSM). Let's take these in chronological order: Please tell us about your experience as Program Chair for eCOTS. What challenges did you face, and how did you overcome them? With the benefit now of a few month's hindsight, what's your overall impression of the conference?

ME: You ask such thought-provoking questions, Allan! I was just thinking recently about how last year at JSM (in 2011), at our CAUSE activists meeting, we shared our ideas about eCOTS for the very first time with everyone. At that point, there was so much uncertainty about whether we could pull off an online conference and what it would look like and whether anyone would attend. It's hard to believe now that our initial ideas came to fruition and that we had the success we did with eCOTS. Over 400 people registered for eCOTS, and this far exceeded what we hoped for.

I think the biggest challenge for those of us on the programming committee is that we had no experience whatsoever with online conferences, so it was difficult to know where to start. After JSM, I was able to put a small program committee together, and together, we tackled many things, from trying to decide on conference themes to coming up with a solid structure for the conference and a way to solicit (and eventually review) conference proposals. So many decisions had to be made in terms of what system we would use to deliver the conference and how long online presentations should be and how much time we'd need between presentations to make sure things moved along as smoothly as possible.

We could not have done what we did without the tireless efforts of Justin Slauson and Jean Scott at The Ohio State University. I think they barely got any sleep during the weeks before and

during eCOTS, and they did so much great work behind the scenes in terms of learning about the conference system we were using and putting together an excellent web space within CAUSEweb to house all of the conference presentations and the virtual poster presentations (http://www.causeweb.org/ecots/). Along the way, we had some very minor technology glitches, but otherwise, I felt things went well. We had several thought-provoking online "break-out sessions," and we tried to make these as interactive as we could, and it was exciting to meet new people during the conference who are doing some interesting work. We had a workshop as part of the conference on the CATALST curriculum that was developed at the University of Minnesota, and some of our Statistics Education graduate students (Rebekah Isaak, Laura Le, and Laura Ziegler) led that workshop and had great turnout. The conference culminated in keynote talks from Hans Rosling and Webster West, and we also managed to re-assemble many of our speakers during the last day of the conference for some Q&A sessions.

In light of all that we learned and experienced with the first eCOTS, I am already excited about planning for the second eCOTS, which we hope will take place in 2014. What was most amazing to me is the thought that we were able to bring together so many people from around the world, and we could all be there at the same time listening to the conference and interacting with the speakers, from the comfort of our own homes in some cases. Most days during the conference, I was sitting in my home office with my sweats and slippers on. It's not often you get to go to a conference in that kind of attire.

You asked about overcoming challenges, and, as I said in an earlier response to another question, I think collaboration is the key to that. Dennis Pearl and I had a great team of people to work with as we put eCOTS together, and everyone brought great strengths to the project and ideas for things to try and ways to do things. We could divide the workload when possible and help each other. We were all committed to making this a success and everyone worked very hard to accomplish that. It was a very proud moment for me to see what came out of our work, and to see the reaction we got from the Statistics Education community.

AR: What was it like to "meet" the world-renowned Hans Rosling? That must have been quite a moment when he accepted your invitation to be one of the keynote speakers.

ME: Well, we all have Dennis Pearl to thank for making that happen. He was the one who orchestrated this, and it was Michael Posner's idea to ask Hans Rosling to be a speaker to begin with. We figured we didn't have anything to lose by asking him, and I can't express how thrilled we were when he accepted our invitation! I'm still somewhat speechless about all of that. I was the one who introduced Hans and moderated his keynote presentation, and I barely slept the night before. I was so nervous about working with him, and I remember how my hands were trembling that day and how I had butterflies in my stomach at the thought of getting to talk to THE Hans Rosling! It was surreal. In the end, I think I got all worked up for nothing. He is such a nice and gracious person, and he ended up being very easy to talk with. He's very funny too. I only wish there had been more audience questions for him, but I assume everyone was as stunned and in awe of the whole thing as I was. That was definitely a highlight of the conference for me. We'll have to think about how we can possibly top that when we begin planning for eCOTS 2014!

AR: I wonder if Rosling was also wearing sweats and slippers for the conference. What about your experience as Program Chair for ASA's Statistical Education section at this year's JSM in San Diego? That must have been a very different experience, considering what a huge conference JSM is and all that's entailed in organizing its program.

ME: Yes, I wonder that too! ☺

You and I should compare notes because I know you were also a Program Chair at one point for the Section on Statistical Education. It definitely was a very different experience for me, and I'm glad I got to do it. I have new appreciation now for all that goes into putting that conference together and making it run in such an organized fashion. However, honestly, I feel that I didn't do a lot of work in my position as Program Chair. I helped people when it came to submitting proposals for the conference, and I solicited some proposals, and reviewed all of the proposals as they came in, but it's really all the people who participated in the conference as speakers, chairs, and organizers who I feel did the most work. I traveled to ASA headquarters in February to help put the program together and meet the rest of the program committee (which was very exciting—I had never been to ASA headquarters before!), but after that point in time, I felt the bulk of my work was done, with the exception of some minor programming issues. The only thing I'm sad about is that I did not get to check in at JSM with all the different sessions that were a part of the Statistical Education program. I wanted to be able to be at each session (if only briefly) and at the very least thank all the people involved for being a part of the program. Unfortunately, there has to be a certain amount of overlap in sessions, and with all the other meetings going on at JSM, it's challenging to be in so many places at the same time.

One thing I was very honored to be a part of at this year's JSM was the memorial session for Martha Aliaga. I never got a chance to meet Martha, but the memorial session was such a touching and beautiful tribute to her, and I'm glad we were able to make that happen.

The current Program Chair for the Section on Statistical Education is Amy Wagaman from Amherst College, and I'm excited to see the program she puts together for the 2013 conference (especially after the great job she did at this year's JSM when it came to organizing the roundtable sessions).

Pop Quiz

AR: Now let's begin what I call the "pop quiz" part of the interview, where I'll ask very specific questions and will ask you to give very brief answers, perhaps just a word or two but no more than 3 sentences. First, what are some of your hobbies outside of statistics education?

ME: I have to preface my answer by saying I'm currently in the process of trying to acquire more hobbies. ☺ As my husband can well attest to, I tend to be a bit of a workaholic, and I'm trying to get better about stepping away from the computer and finding a more appropriate balance between work and play. One of my most favorite things to do is to go bike riding. Last summer, I purchased a bike, and I've been riding a lot lately. We live out in the country, near a wildlife refuge, so there are many great places around my house to go riding, and I take long rides whenever I can. I'm very much a homebody and I enjoy trying to find ways to renovate

our house, playing with our dogs or cats, and working in the yard. At some point, I'd love to learn how to knit, and I've also always wanted to get into making my own candles.

AR: What are 1-3 books that you've enjoyed reading in the past year?

ME: For as long as I can remember, I've been fascinated with true crime novels. At one point, when I was an undergraduate, I even thought seriously about pursuing a second major in Criminal Justice Administration because of my interest in criminal investigation. Ann Rule is one of my favorite true crime authors, and I recently read her book *Don't Look Behind You and Other True Cases*. I enjoy pop culture and recently read *Confessions of a Prairie Bitch: How I Survived Nellie Oleson and Learned to Love Being Hated* by Alison Arngrim. I also read a great book about writing called *Bird by Bird: Some Instructions on Writing and Life* by Anne Lamott. Joan recommended that book to me, and, as someone who wants to write more, I found it to be very inspiring.

AR: What fascinating titles! How about movies: please name 1-3 movies that you have enjoyed in the past year, either in a theater or on video or on the computer or however people watch movies these days. (At least I didn't say VHS, or even worse Betamax!)

ME: It's actually been quite a long time since my husband and I have been to a movie in a theater, and I usually watch more television than movies these days (mostly online by going to www.hulu.com or www.pbs.org). I found one of my favorite movies (*The Station Agent)* on Hulu not too long ago and I watched it for the third time. My husband and I also watched a very good movie recently called *Bomber* about a man who takes a road trip with his parents to Germany. *The Castle* is also a favorite that I have watched numerous times. It's all about a family in Australia who is fighting to keep their home (or their castle) from being demolished by the expanding airport next door.

AR: You mentioned your husband a few answers ago. Please tell us about him and also about your larger family.

ME: My husband's name is Chad, and in December, we will celebrate our 14th wedding anniversary. Chad is a small-business owner and the focus of his business is on relic and treasure hunting. Chad is passionate about history and he travels to different locations to uncover relics and other artifacts that will allow him to tell the stories of what happened years ago at these locations. This summer, for instance, he has been busy at a farmstead about eight miles from our house that used to be the location (back in the early part of the 20th century) of a general store. He has uncovered many old bottles and tools and other things from this location. He brings his metal detector along with him and also does a lot of digging by hand. He loves it. He also started his own magazine almost two years ago called Temerity Magazine (www.temeritymagazine.com) and the magazine is a collection of articles written by other relic and treasure hunters. There is a whole network of these individuals all over the country and in different parts of the world, and, interestingly, many of these people actually first came to Chad's attention through YouTube.

In terms of my larger family, my parents live in California, where I grew up. I grew up in the Bay Area, but my parents moved a few years ago to a city called Riverbank (right next to Modesto). My sister and her husband and two sons live in Riverbank as well. Most of my husband's family lives in North Dakota (in the Valley City area) where he was born and raised.

AR: That's fascinating about your husband's business. Speaking of across the country and around the world, what are some of your favorite places that you have travelled to? Perhaps you could name one place that you've been for work and one for pleasure.

ME: Unfortunately, I haven't travelled the world yet, but I hope to someday. Most of my travel has been within the United States. Seattle is definitely a favorite city (perhaps because of my love of coffee) and I have travelled there for work. I also really enjoy Chicago, and I think San Francisco will always have a special place in my heart since it's close to where I grew up.

AR: Now let me get a bit fanciful. Suppose that I offer you a dinner for four where you can discuss statistics education to your heart's content. You get to choose your three dining companions and the location for this dinner. Who would you choose, and where would you dine?

ME: This is such a tough question! Even though the topic of our conversation would be statistics education, I think I'd choose dinner companions who are not involved at all in the teaching of statistics but who I believe would have a lot to teach me about how to be a better teacher.

I would love to invite Rena Palloff. She is a big name within the Distance Education community and she has written a lot about active learning within the online environment and getting students involved in discussion within the online environment. I think I could learn a lot from her about how to better structure some of my online discussion assignments, and I would imagine she'd have great suggestions for new things I might try.

I've been very inspired by the work of Michael Wesch at Kansas State University. Michael is a cultural anthropologist, and his area of interest is exploring the effects of new media on culture and society. I first learned about him a few years ago when I viewed his video *A Vision of Students Today* (http://www.youtube.com/watch?v=dGCJ46vyR9o). For some reason, that video had a profound impact on me, and I enjoyed it so much that I found myself trying to think of what it all meant for the teaching of statistics. I was even trying to find ways to create assignments in some of my courses based on that video. Michael has a newer video out called *The Machine is Us/ing Us* (http://tinyurl.com/7ehao9y), and this video is all about how technology has changed over the years, and how Web 2.0 technologies are changing the way people interact with information and with each other. I would love to hear some of his thoughts on what this might mean for the statistics classroom, especially given my own interests in social media.

My third dinner companion would have to be Hans Rosling. His "Joy of Statistics" series was powerful and I sometimes show snippets of that to my students. Plus, I am fascinated by what he does in terms of helping us visualize data, and I'd love to hear more from him about how his

work could be used for instructional purposes. He strikes me as being so energetic and passionate, and I bet he'd have many great stories to share with us at dinner!

In terms of where we'd dine, I've always wanted to travel to Australia, and I love being near the ocean. If it was possible to have a nice dinner somewhere along the coast in Australia, on a warm day, I think that would be especially nice. If pizza could somehow be involved in this dinner, with cupcakes for dessert, that would be perfect. ☺

AR: That sounds terrific. I admit that I have not heard of your first two guests but am now anxious to learn more about their work. I only regret that this question was entirely hypothetical and I lack the ability to make it happen. Next question on the pop quiz: What is your favorite course to teach?

ME: I feel very fortunate in that I regularly teach four courses that I enjoy, and it's hard to pick just one as being a favorite because they are each special to me in different ways. If I had to pick one, however, I'd have to say it's our graduate-level introductory statistics course. That course has a special place in my heart because it was the first course I worked with as a graduate teaching assistant, and it's the course I have taught the most. I enjoy how motivated the students are, and I like that I can (hopefully) give them an introduction to statistics that is much less daunting than they tend to anticipate. I've worked with some wonderful students in that course over the years and I still remain in touch with several of them, largely because of our shared affiliation with the College of Education and Human Development. I've been asked to be on many thesis and dissertation committees by former students, and I feel this has allowed me to grow as a professional and to learn more about areas that I am not very familiar with (like Nursing or Kinesiology). I love the many activities we use in our introductory courses and I like that we are always trying to improve what we do and make changes. Every time I teach that course, I learn something new from my students, and that is thrilling to me. I think that is why I enjoy teaching so much. I feel at times that I learn just as much, if not more, from my students as I hope they will learn from being in my course.

Collecting Data

AR: And now, just for fun, I'll ask you some questions that I often collect data from my students on. Let's start with some questions based on binary variables: Are you using a PC or a Mac right now? Would you call yourself an early bird or a night owl?

ME: I use a PC and I'm definitely an early bird.

AR: Here's one more that is a binary variable but harder to describe: Suppose that time travel were possible, and you could take one trip. You can only observe, not change anything, when you get there. Would you travel to a time in the past or in the future? (Go ahead and explain your answer for this one.)

ME: I think I would travel back in the past because I'd like for the future to be a surprise. When I first moved to Minnesota, I became very close to my Grandma Irene, and I would spend almost every weekend visiting her. She passed away in 1999, and I really miss her. I only knew her as

an older woman, but I would love to know what she was like as a young woman, when she first met my grandfather. I think I'd like to go back to that time (so, sometime in the 1920s or 1930s).

AR: Here are some questions based on categorical variables that are not binary: What's your favorite type of juice to drink? On what day of the week were you born? (You can use www.timeanddate.com to produce a calendar for your birthyear.)

ME: I like fruit punch, and I was born on a Wednesday.

AR: And now a question from a quantitative variable, but a very discrete one: How many Harry Potter *books have you read?*

ME: 0

AR: Finally a question with a more continuous quantitative variable: How many miles do you currently live from where you were born? (You can use www.distancefromto.net to calculate this distance.)

ME: 41.43 miles

Parting Thoughts

AR: The theme of the USCOTS conference held last year was "the next big thing." What do you think the next big thing in statistics education is?

ME: Do you even have to ask me this, Allan? ☺ I think online education is the next big thing. More and more classes are going online every day, and I feel that as statistics educators, we need to think carefully about how to create quality online courses for our statistics students. Teaching online is so much more than just throwing all your materials onto a website. There are so many innovative things we can be doing and exploring and studying when it comes to distance education, and I hope this is where we are going in the future. It's definitely where I would like to be going.

AR: Well, even a non-surprising answer can be enlightening. I certainly can't dispute the idea that online education will become an even bigger presence in the coming decade, and I agree completely that we need top-notch statistics educators to be thinking and working hard at producing high-quality resources and courses.

Now I'll ask about the theme of next year's USCOTS: Making Change Happen. What is your attitude toward change: do you fear it or embrace it, or perhaps some of both? How has change played a role in your career? What thoughts do you have about how statistics educators can make change happen?

ME: Wow. So much springs to mind as I read these questions, Allan, and I'm trying to find the best words to express how I feel about this. Hopefully I can organize my thoughts by taking your questions one at a time.

First, I would say that, personally, I both fear and embrace change. Throughout my life, I've tended to be a creature of habit, and change has sometimes been difficult for me, perhaps because I find such comfort in knowing just what to expect, and when you change, you don't always know how it's going to turn out. However, I know that change is necessary to grow and to experience new things, and I don't want to get stuck in a rut. I don't want to become content with the status quo because I know it's always possible to do things better, and honestly, I get a thrill when I push myself to do the unexpected and when I experiment with new ways of doing things.

Second, I feel there are so many ways change has played a role in my own career. When I was younger (in elementary school and high school), I was painfully shy. I never spoke up in class unless I was forced to, and I had very little confidence in myself. If you had told me back then that I would grow up to be a teacher, I would have looked at you like you were crazy. I was so shy and quiet that I was voted the "Quietest Senior" when I was in my final year of high school. Teaching has been a way for me to face my fears head on because I constantly have to put myself in a position that is extremely frightening to me (i.e., talking in front of other people). I feel that being a teacher has changed me in so many ways and given me so much more confidence than I could have ever dreamed of. Maybe this, in part, is why I tend to equate change with facing your fears.

I've also changed the way I view the role of the teacher. As I mentioned earlier, the teachers I had, before coming to the University of Minnesota, were all mostly lecturers (in the sense that they simply lectured to their students). This is largely what I thought teaching entailed. I viewed the good teachers as the ones who were able to put together the most informative and entertaining lectures. I've radically changed my views about teaching, and I couldn't dream of ever teaching a class that didn't involve student activity and discussion. My thoughts on how students learn have also changed a lot. Recently, I've started to incorporate more and more opportunities in my courses for students to have some choices in terms of how they learn and what they learn because I don't necessarily feel there is a "one-size fits all" approach to teaching. I've changed some of my curriculum so that students have choices in terms of the software package they use in the course, and some of my assignments can be completed in different ways, by choosing different options or different types of projects to pursue. In the spring, we'll be changing the curriculum in one course even more dramatically as we begin to incorporate more randomization-based methods in the course.

Finally, teaching online has been a very big change for me. I recently read an opinion piece in *The Chronicle of Higher Education* about an online instructor who was reflecting on his experiences teaching online for the first time (Ward 2012). He said one lesson he learned is that teaching online involves thinking of the classroom in different ways, and thinking about what you do in different ways. I had to carefully examine what I was doing in the classroom and think about what could and could not be done in the online environment, and how I would need to do things differently to engage and motivate my students. I had to change my ways of thinking about what constitutes a classroom, and I had to change some of the ways I attempted to share information with my students since I knew they would not always be able to see me or hear me. I had to change the way I interacted with my students and also some of my expectations,

especially as I learned about how much more time certain activities would take to complete in the online classroom.

In terms of how statistics educators can make change happen, I think it's important to set realistic goals and to understand that change can take time. You do not have to jump off of the deep end and make many huge changes all at once. It's okay to take some baby steps and try out new things here and there. Of course, we might make changes and not see the effects right away, and this is okay. You need to be patient. I also think, as my colleagues are fond of saying, that it can "take a village" to make change happen. You don't have to go it alone, and, ideally, you won't have to. If I had to offer any advice to other statistics educators it would be to try to find others who share your interests and your passions and to collaborate with these individuals. Find a network that you can reach out to and get advice from and share ideas with. If you don't have that at your own institution, don't be afraid to try to build your own network. With online technologies, there are so many ways we can easily connect with and communicate with colleagues from all over the world, and it's important to take advantage of these opportunities. When I first started teaching online, I felt somewhat isolated in my own department because none of my colleagues were teaching online statistics courses, but I was able to help form a network (and ultimately an online discussion list) of online statistics instructors (which we refer to as "Statistics Instructors Lost in Cyberspace"), and this group has been a great sounding board for me as I have struggled with trying to make different changes in my online courses. I feel it's so important that we all have these kinds of sounding boards.

AR: Thanks very much, Michelle. I think it's a great inspiration to know that it's possible to embrace change while sometimes fearing. As we are conducting this interview, you are about to begin a new academic year. Do you get nervous as a new academic year begins? Excited? More or less excited than in the past?

ME: I'm both excited and nervous. I always find it exciting to begin a new academic year, and I don't know that this has changed much over the years. I sometimes think that if I get to the point where I'm *not* excited about a new year, it's probably time to pursue a different career. I love that with my job, things change every semester simply because I get a new class of students to work with. I never know quite what to expect or how things will go, and that can be exciting. Of course, that can also make me very nervous! I still get butterflies in my stomach when I meet with a new class for the first time, but it seems that as soon as the first week of a new semester is over, I'm fine. I also get nervous about the work that I know will be ahead of me in terms of creating assignments and other course materials, getting materials up on my course websites, and grading. I'm teaching three online courses this semester and I know this will be a lot of work. Right now, it seems like the calm before the storm as I'm waiting for the semester to officially begin.

AR: With other interviews that I have conducted for JSE, I asked about the accomplishment in statistics education of which the person is most proud. Because you're still near the beginning of your career, let me ask a different question: What accomplishment in statistics education are you most aiming for over the next 10-20 years of your career?

ME: I can think of several things I'd like to accomplish. I definitely want to remain as involved as I can be in issues related to distance education. I want to continue to find ways to improve the teaching of online statistics courses and to work with other educators who are as passionate about online teaching as I am. I want to continue trying to form a network of online statistics instructors and, ideally, a nice web repository where online statistics educators can go to find new resources to try in their classrooms or new activity ideas, or to just learn about ways to connect with other online statistics educators.

I want to continue the tradition of great work begun by previous *JSE* editors as I take over as editor. I also want to write a lot more and publish my own work in the coming years. I haven't done as much of that in my career as I would like. I also want to delve more into research. I think of myself very much as a teacher but not so much as a researcher, and I would like to try on the research hat for a while to see how it fits.

Finally, I want to become a mentor to up-and-coming statistics educators. I wouldn't be where I am now were it not for the great mentorship of Joan Garfield, and I want to be able to mentor others as she has mentored me. Of course, nobody can fill Joan's shoes, but she has taught me so much, and I would like to be able to pass that on to others.

AR: Best of luck with these very admirable goals, and thanks again for all of the time and thoughtfulness that you have devoted to this interview. My final question will give you an opportunity to do some mentoring right now: What advice do you have for JSE *readers who are fairly new to statistics education?*

ME: Thank you, Allan. I've had a lot of fun with this interview because it's given me a chance to reflect on so many things, and I've liked being able to work with you. I can see now why you enjoy these interviews so much!

I think it's important for *JSE* readers who are new to statistics education to know that we are a very friendly and approachable community of individuals who are doing great and innovative things. I am often in awe of the fact that I am part of this community and that I have gotten to know and become friends with so many people who I respect and admire so much. If you are new to statistics education, I would say to try to reach out to people whose work you are interested in or who have inspired you in some way. Try to come to a conference where you can learn more about what is going on in statistics education, like USCOTS or JSM. Get to know the many great resources out there for people who are interested in statistics education and who want to improve their teaching of statistics. Take some time to explore CAUSEweb or MERLOT, or other journals (in addition to *JSE*) that are devoted to statistics education, like the *Statistics Education Research Journal* (*SERJ*) or *Technology Innovations in Statistics Education* (*TISE*). Also, find ways you can get involved and pursue what *you* are passionate about. There is so much that has been done in this field but still so much to do!

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