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EDITORIAL

The Death of Expertise

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Recently, Nichols (2014) bemoaned the idea that in today's US democracy any assertion of expertise results in strong, and often angry, reactions emphasizing that such claims are "appeals to authority, sure signs of elitism, and an obvious effort to use credentials to stifle the dialogue required by a "real" democracy" (p. 1). He further elaborates that, although the public possesses rights equal with the government, it does not mean that all citizens have equal talents, abilities, or knowledge, and it doesn't mean that everyone's opinion about anything is as good as anyone else's. In the end it is concluded that we may be contributing to the "death" of expertise.

Although Nichols' characterization may be a bit extreme, it certainly resonates with what we consistently experience as teacher educators. Several years ago our association, then known as AETS, developed professional knowledge standards for science teacher educators (Lederman et al., 1997). These standards still exist today and can be found on the organization's website. The motivating force beyond the development of these standards was the notion that, as a professional organization focusing on science teacher education, we should have some expert knowledge about who should and who should not be educating preservice and inservice science teachers. Overall, there were six standards delineated and they focused on the following areas of knowledge, experience, and abilities: (1) subject matter knowledge, (2) science pedagogy, (3) curriculum development, instructional design, and assessment, (4) learning and cognition, (5) research/scholarly activity, (6) professional development. These standards were designed, not as a checklist of abilities, knowledge, and experiences, but rather to delineate the difference in perspective that exists among an experienced scientist, science teacher, and

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professional science teacher educator. It is critically important to note here that the conceptualization we are using of a science teacher educator is an individual who works at a post-secondary institution of education and teaches inservice and preservice teachers about the teaching and learning of science. This view is consistent with Loughran's (2014a, 2014b). Consequently, a scientist teaching subject matter to teachers is not considered here as a science teacher educator. Certainly subject matter knowledge is important, but in our view the scientist is an expert in science knowledge, but not necessarily in how to best teach it. Don't get us wrong. Of course there are exceptions, those scientists who have taken the time to learn about teaching and learning at the K-12 levels.

These standards were submitted to the membership of the organization for approval and were easily approved, but there was some significant concern among some that the standards were exclusionary because they would eliminate certain individuals who were participating in teacher education activities, but would not meet all the specifications noted in the standards. For example, it was noted that many well meaning scientists may not have the K-12 science teaching experience desired. The issue here of being exclusionary harkens back to the idea of the "death of expertise." Does our profession contain any specialized knowledge and abilities? We believe it does and members of our profession should possess certain knowledge and abilities. By their very nature, professions are exclusionary and typically have standards that delineate what credentials individuals should have. Although we all experience otherwise, not everyone's opinion on how to best educate science teachers is of equal validity.

Our association is not unique in having standards. The Association of Teacher Educators (ATE, 2008) has had teacher educator standards since 1992. The ATE standards stress cultural competence, scholarship, professional development, collaboration, program development, public advocacy, profession of teacher education, and professional vision. Standards from the Netherlands identify competencies in content, pedagogy, group dynamics and communication, developmental and personal growth, and organizational competencies for teacher educators (Murray & Male, 2005). Finally, Smith (2005) did a comparison study of teacher educator standards from the Netherlands, Australia, Israel, and the United States and concluded there was a large overlap of the substance found in the various standards, which included model teaching, research and scholarship, leadership in the profession, and on-going professional development. Overall, it was concluded that there were many commonalities in teacher education standards across contexts and there was a general pattern of agreement concerning knowledge, skills, and dispositions. And, a key point that should not be lost is that the various standards embrace the idea of sets of interrelated knowledge and abilities. The professional teacher educator must develop expertise in all of the areas specified in the standards, not just a sub-set. This is what separates the content expert, from the pedagogical expert, from the teacher education expert.

Standards for teacher educators clearly exist and there continues to be a concern about the most desirable knowledge, abilities, and dispositions of teacher educators, as evidenced by the special issue of the *Journal of Teacher Education* on professional development and practices of Teacher Educators (JTE, 2014). This

continued concern is no doubt the result of the consistent criticism, by large sectors of our society, about the quality of education in the US and throughout the world. After all, if students aren't leaving our pre-college school systems with the knowledge and skills that enable them to be productive citizens, it must lay in the quality of the teaching, and if teachers are not of high quality, it must be the fault of teacher educators. Didn't someone say, "Those who can do, those who can't teach, and those who can't teach, teach teachers?"

Our suspicion is that very few ASTE members feel that they do not have special knowledge about how to facilitate the development of pre and inservice teachers. We also suspect that very few ASTE members have concerns about who is best qualified to be working in the area of teacher education. However, the problem arises when individuals whose primary role is teacher education bumps up against a set of standards that they do not meet. It is human nature to immediately feel the standards are wrong, not needed, exclusive, and perhaps elitist. Is there a death of expertise even within our own profession?

When Norman was President of the National Association for Research in Science Teaching (NARST), his Presidential Address was titled, "Improving Research Through Teaching." This was a play on the words of the NARST motto of improving teaching through research. The gist of the address was that the quality of research on teaching could be improved if the research was completed by someone who had previously taught or in collaboration with someone that had taught. Naturally, this was not a popular message with many NARST members because many of them have not taught. Norman was implicitly saying that if you have not taught the quality of your research about teaching and teachers' thinking may be compromised. In essence, it was a message that was exclusionary by nature. Norman knew this in advance of the presentation and he would not change it if we were able to go back in time. We have no doubt that some of you reading this editorial are now angry at such an extreme view. But think about it. Don't we always say that students learn by doing? The best way to learn about K-12 teaching MUST include some actual teaching at the K-12 levels, or at the very least collaborating with someone who is currently teaching (e.g., co-teaching).

We are all well aware that teachers teach to the high stakes tests that have been invoked by policy makers. The same has been true of science teacher education and is becoming even more evident. We have all been influenced to some degree or another by the teacher education assessments/evaluation approaches developed to guide what is included in science teacher education in the same manner as it guides subject matter curriculum. We have all been influenced over the years to one degree or another by the assessments/evaluations of teacher education programs created by NCATE, the National Council on Teacher Quality (NCTQ) and, more recently, the Council for the Accreditation of Education Preparation (CAEP) and edTPA from Stanford University. Some of these are direct measures of teacher education programs, while others are more indirect. It is quite possible that these assessments/evaluations are a movement in the direction of establishing and/or maintaining standards for teacher education. However, it has yet to be demonstrated that these various assessments/evaluations are firmly grounded in the empirical research on effective teaching. Indeed, all of the recent increase of work to establish valid assessments of pedagogical content

knowledge (Loughran, 2014a, 2014b; Van Driel, Berry, & Meirink, 2014) has indicated how complex an endeavor it is to assess effective teaching and, hence, to systematically develop a quality teacher education program.

In summary, what does this all mean? We don't think that we should advocate a death of expertise in science teacher education. That would signal the demise of our profession. This is not just about protecting territory. We all DO KNOW many things specific to the development of science teachers, that other people do not automatically know from intuition or experience. We do have expertise. Our approaches to science teacher education are research-based and not from the seat of our pants. We should be able to defend our actions and programs with empirical evidence. Although difficult at times, we MUST monitor the quality and integrity of our own profession. We are not saying that there is a single best way to educate science teachers. We are far from that end, an end that will likely never be achieved. What we are saying is that, as a community, we do have expertise that should carry more weight than the opinions of those outside our field.

With respect to being too exclusive, there is a practical matter that should be discussed. Many of us admit individuals into our PhD programs who may be lacking in certain areas. This may be for a variety of reasons, including intuition. We must not lose sight of the fact that, although the focus of our programs is on developing future researchers, these individuals will often be employed as science teacher educators. Of course, we can always say that the purpose of our programs is to nurture the areas with obvious gaps. However, sometimes there are gaps that are not addressed by the typical requirements of a PhD program. For example, what about the student with exemplary subject matter background that does not have any teaching experience? This individual should be afforded opportunities to have classroom teaching experience as part of his/her PhD program. In addition, we, in general, need to do a better job of preparing our PhD students to develop all the skills and knowledge necessary to be a teacher educator, not to just be a researcher. Indeed, Loughran (2014a, 2014b) documented that most teacher educators had experienced little opportunity to learn the knowledge and skills required of a teacher educator in their doctoral programs.

There is nothing wrong, in our eyes, with having explicitly stated standards and expectations for the knowledge and practices of science teacher educators. We do have expertise in the teaching and learning of science and this expertise should not defer to the wide variety of "expert opinions" from those without in-depth knowledge in our field, based on assumptions that everyone's opinions are of equal validity. Insuring the integrity of our academic programs, and preserving the prominence of our empirically supported knowledge is critically important to our science teachers and, most importantly, their students.

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