Lesson for First Day of Methods Class: Supporting Preservice Teachers' Understanding of Expertise Development

by Patricia Friedrichsen, University of Missouri; Benus, Matthew J., Indiana University Northwest; Wulff, Eric, University of Missouri; & Womack, A.J., University of Missouri

Abstract

This lesson is designed for use on the first day of a middle or secondary-level science methods course. Beyond getting to know our new students, our goals are to address two challenges: 1) preservice teachers' unrealistic expectations of being expert teachers upon graduation, and 2) science teacher retention. In this lesson preservice teachers are asked to share their expertise in an area of their personal lives (e.g., hobby or sport). Our students have shared their expertise in a wide range of areas from photography to cheerleading to fishing. As each student shares his or her expertise, students come to realize that developing expertise in any area takes a great deal of stamina, passion, tenacity, and mentoring. We draw upon insights learned by students during their expertise conversations and help students to understand how to align those insights to developing their own expertise in teaching. We share two different implementation versions of this lesson and how we continue to draw upon this first day discussion throughout the semester. Student interview data revealed that the lesson resulted in new insights about classmates and a better understanding of the lengthy process of developing teacher expertise.

Introduction

The first day of each new semester is an exciting time. As teacher educators, we know the importance of getting to know our students and establishing norms for the semester. In January of 2016, the authors met for the first time at the Association of Science Teacher Educators (ASTE) conference. In discussing our upcoming classes, we talked about different discussion prompts we have used over the years to get to know our new students:

- Share something about yourself that no one in the group knows about.
- What are two truths and a lie about yourself? We will guess the lie.
- If you could be funded to research something for a year, what would it be and why?
- What is one thing that makes you unique in this group?
- If you could have dinner with any two living or deceased scientists, who would you choose and why?

These questions were designed to help us get to know our students while eliciting responses that might be of interest to everyone in the class. Each student response provided insights and a chance for follow-up questions and comments; however, over time, we had each become dissatisfied with these types of questions and the surface level responses from students. The pre-service students at each of our institutions move through their respective teacher education programs as a cohort (ranging in number from 7-24), so they are already quite familiar with each other by the time they enroll in our methods courses.

Matthew shared a lesson he has used for the last three semesters. This lesson focuses on students' prior experiences building expertise in some area of their personal lives (e.g., a hobby or sport). We discussed how we could draw generalities from their experiences as experts to address a persistent issue common to teaching methods courses—students' desire for methods courses to teach them everything they need to know to immediately be a highly effective science teacher. As teacher educators, we also share a common overarching goal of trying to improve teacher retention. As we continue to craft our understanding of teaching effectiveness and supports for teacher retention, we are reminded that experts are thought of as *effective* at what they do and often have levels of stamina, passion, and tenacity that *retain* their interest in their expertise as they continue to push their skills to new levels. By drawing upon students' experiences in developing expertise in their personal lives, we hope to show parallels to the process of developing teaching expertise.

In this initial lesson for the first day of methods class, we ask our students to share their expertise in an area outside of teaching. In looking across all the students' stories, we identify some common themes about expertise development and then apply these themes to becoming an expert teacher. In the next two sections, we each share our slightly varied approaches to implementing this lesson.

Pat's Implementation

On the first day of class, I briefly introduce myself and ask students to introduce themselves. Next, I ask students to think about an area of their lives in which they have developed expertise. I avoid using the word, "expert," but rather focus on the term, "expertise" to avoid intimidating my students. I tell them they will have approximately 5-7 minutes to talk about their expertise. I state that our goal is to listen to each student's story about developing expertise and be able to generalize how expertise develops. To provide an example and give students time to think about what they are going to share, I begin by sharing my own expertise.

I purposely avoid choosing teaching as an area of expertise but rather draw from one of my hobbies, knitting. I share that a 4-H leader taught me to knit when I was eight years old and that I struggled as I was learning to knit, finding it difficult to coordinate needles, yarn, and tension. For many years, I only knitted flat pieces, like potholders and scarves, and used inexpensive, synthetic yarn. I continued to work on my knitting throughout elementary school,

gradually improving. In eighth grade, I entered an afghan at the county fair and was nearly disqualified. The judge declared that an 8th grader was not capable of knitting such a complicated pattern and that my mother must have made the afghan. Fortunately, a neighbor overheard the judge's comments and intervened on my behalf, informing the judge that my mother did not know how to knit, verifying I had made the afghan. I won a coveted purple ribbon at the fair. I share that I enjoy knitting, and that I often challenge myself with difficult patterns to further develop my skills. When I choose a particularly challenging pattern, I am persistent and keep ripping out my work and starting over until I figure it out. I have literally worn out expensive yarn trying to learn a complicated pattern. If I cannot master a pattern on my own, I eventually seek help from an instructor at a local yarn shop. I also watch YouTube videos to learn new knitting techniques. I read knitting magazines and I love to try new types of yarn. Although my skills have advanced over the years, there are still specific skills, such as knitting lace, that I would like to learn. After I share my expertise, I encourage students to ask me questions.

This semester, I was fortunate to have a graduate student, Eric, as a teaching assistant. Eric shared his expertise in playing tennis with the class. Below is the re-created written summary of Eric's story:

I have been playing tennis since I was six. My dad started taking me to the tennis courts every week, and as I began to learn the game, we would play almost every day. I quickly learned that so much of this physical sport relied on strategy and mental fortitude. Once the mechanics of the major shots: forehand, backhand, serve, and volley are learned, one can begin to develop a strategy that is suited to the player's personal strengths. This strategy is ultimately determined by the strengths and weaknesses of the opponent, as mechanics are combined in a way that targets the opponent's weaknesses. While this strategy provides a guiding plan that can be used during a match, the outcome is also determined by execution. This is mastered through long hours and incredible preparation. (Eric)

When Eric finishes talking, I ask probing questions to learn more about the process of learning to play tennis, such as "What skills do you still need to master to go to the next level of playing?" and "What role did your dad play in helping you develop your expertise?" I use these questions to model the type of questions that I want the students to begin to ask each other.

After Eric and I share our areas of expertise in quite different areas, knitting and tennis, I ask students to write notes about common themes across our stories. I ask them to continue to take notes as individual students share their expertise. I encourage them to ask questions to confirm or disconfirm their initial themes and explore potential new themes. At this point, I do not have students share their initial themes.

I ask the first student volunteer to talk about her expertise and indicate she will have approximately 5-7 minutes to talk. I continue to ask probing questions to help us understand how expertise develops, such as “How long did it take you to get to this level of expertise? Who was instrumental in helping you? What experiences have pushed you the most in developing your expertise?” One student answered this latter question by saying that she had learned the most when she failed to win a major competition, forcing her to re-evaluate her skills. The students are quick to start asking each other similar questions as well as adding new ones, such as “Why do you like this so much? What drives you to continue to improve?” Sometimes the students get engrossed in unfamiliar topics, and want to know more specifics. For example, as a group, we were unfamiliar with one student’s area of expertise, riding a RipStik™. Once we have the general idea, e.g., it’s a type of skateboard, I gently guide them to focus their questions on gaining more information about developing expertise in general. This semester my students shared their expertise in the following areas: baking, crocheting, photography, organization, competitive cheerleading, fishing, rip sticking, softball, competitive dance, baking, and basketball. Every student was able to share their expertise in an area in which they were quite passionate.

Next, I ask each student to share one common theme from his/her list with the class. As each student shares a theme, I encourage the class to add any new themes to their individual lists. We continue to share themes until our individual lists are exhausted. As a group, we created the following class list of common themes related to developing expertise:

- It takes a big time investment over many years to develop expertise.
- Mentors are critically important to developing expertise.
- Experts learn from their failures and mistakes, as well as feedback from other experts.
- Developing expertise requires persistence.
- Experts are aware of their strengths and weaknesses, and know what they need to do to take their expertise to the next level.
- Specialized vocabulary is part of developing expertise.
- Experts are passionate about their chosen specialty and it’s a big part of their lives.
- Experts surround themselves with passionate people who desire to develop expertise in the same area.
- There is a large emotional investment in developing expertise.

Next, I share the Four Stages of Learning a New Skill (sometimes referred to as the Conscious Competence Ladder model) developed by Noel Burch in the 1970’s: Stage 1 Unconsciously Unskilled, Stage 2 Consciously Unskilled, Stage 3 Consciously Skilled, and Stage 4 Unconsciously Skilled (Adams, n.d.). In the first stage, individuals are unaware of the skills they lack. For example, expert teaching looks easy to preservice teachers because they are unaware of all the skills involved in planning and implementing an exemplary lesson. In Stage 2, individuals realize that don’t have a particular skill. The first time my preservice teachers lead a discussion in class, they often fail and realize that they don’t know how to lead a class discussion. In Stage 3, individuals know they have a particular skill but

still have to think about that skill as they implement it. For example, towards the end of their student teaching, preservice teachers generally become more skilled at teaching a lesson; however, they may occasionally refer to their written lesson plan or pause at different times during the lesson to consider what they should do next. In this stage, when they use wait time during a class discussion, they are consciously counting three seconds in their head before they respond to a student. In the final stage, an individual uses a skill without having to think about it. For example, experienced teachers can lead a classroom discussion in which they elicit students' ideas, challenge misconceptions and help their students develop more accurate scientific understandings, without consciously thinking about how to do this.

We discuss the Conscious Competence Ladder model in relation to their own expertise development and then apply the stages to developing teacher expertise. I remind them they will not learn to become an expert teacher by the end of my course. It will take years of teaching experience and critical reflection to develop teaching expertise—one who is unconsciously skilled. They will need to seek out mentors and learn from their shortcomings in the classroom. I share with students that it generally takes 5-7 years to become an expert teacher (Berliner, 2004). I also share that approximately 18% of newly graduated science teachers quit after their first year (Ingersoll, 2012) with 40-50% of all teachers leaving the profession within the first five years (Ingersoll, 2003) before they have fully developed skills aligned to teaching expertise. To apply the lessons learned about developing expertise, I ask students to write a letter to their future selves. At this point, at the beginning of the methods course, most of my students are in Stage 1, unconsciously unskilled. The letter is intended to be read when they are struggling to develop their teaching skills (Stages 2 and 3) during student teaching and in their first teaching position. In the letter, I ask students to include at least three themes we identified related to expertise that they find personally motivating. Table 1 includes two sample letters written by students.

Table 1

Examples of Student Work from Pat's class

Dear Self,

It's been five years since your methods two class and first off I want to tell you that I am proud of you. These last couple of years have probably been the hardest that they are ever going to be, but think back to the subject of expertise that you discussed in methods. Expertise takes practice. Expertise takes failure; a lot of it. Don't forget to ask for help from another teacher, preferably one that has expertise in teaching. Remember why you started teaching; remember how much you enjoy watching students learn something. Teaching is a big part of your life, it is going to take time to become an expert with an answer for almost anything. Keep trying to better yourself as a teacher.

Love,

Susan (2016)

1/21/16 Pep talk to self about being an expert teacher:

It is said to take 7 years to become an expert as a teacher, but 50% of teachers quit within the first 5 years of teaching. Having come this far with all the work that you put into becoming a teacher, you are capable of becoming an expert. You were able to become an expert at rip sticking and think of all the work that was put into that. Remember these key things about becoming an expert. Much like rip sticking, learn from your mistakes. As you continue to work and teach you will mess up but you can learn crucial lessons from your mistakes and grow from those mistakes. Think back to the two black eyes you got from rip sticking. You didn't stop learning how to ride after that, you got up and worked even harder to prove to yourself you could do it. To become an expert you must not give up after your mess ups, you need to look past them and use it as inspiration. Another thing crucial to becoming an expert is surrounding yourself with teachers that are experts in their trade; learn from them, ask them questions and take their feedback and learn from it. Always remember that no one was born an expert, they had to observe and learn from the current experts in the field and you must do the same for teaching. As you continue to teach remember the basics that you have mastered and build on those. Just like in rip sticking, you couldn't even balance on a board but once you got that down you were able to really master it. Lastly to become an expert teacher never stop looking for areas that you could improve in. A lifelong learner will always look for areas to improve and you should constantly be looking for areas you struggle in and seek to grow in those areas. Stick with it, remember these rules of an expert and you will be able to become an expert teacher.

Cary (2016)

This is my first semester implementing the expertise lesson. As the semester progresses, I continue to see new connections to our expertise discussion and make those explicit to my students. Glaser (1996) described the development of expert performance in general as a change in agency occurring in a progression of three phases.

In the initial phase, *external support,* others (typically, parents and coaches) structure the learning environment to help the individual acquire skills. In the past, preservice teachers have often questioned the extensive lesson plan template used in our teacher education program, contrasting it with the short lesson plan notes of their field placement teachers. I point out that experienced teachers are able to write shorter lesson plans with less scaffolding because they have developed expertise in lesson planning. I share with the preservice teachers that their teacher education courses provide the external support (e.g., lesson plan templates, reflection prompts, peer teaching) needed to help them develop teaching skills. Through course assignments and feedback, their instructors help them develop teaching skills.

The second phase of expertise development, *transition***,** is "characterized by decreasing scaffolding of environmental supports and increasing of apprenticeship arrangements that offer guided practice and foster self-monitoring, the learning of self-regulatory skills, and the identification and discrimination of standards and criteria for high levels of performance" (Glaser, 1996, p. 305). We discuss the role that their field placements and teaching internship play in providing this transition phase. I encourage preservice teachers to observe in the classrooms of highly effective teachers to identify standards and criteria for high levels of teaching performance. Their student teaching supervisors and mentor teachers will help them set teaching goals and reflect on those goals. The preservice teachers will need to continuously assess their progress toward meeting their goals, by collecting evidence from their teaching and reflecting on that evidence.

In the third phase, *self-regulation,* the learner is in control of designing the learning environment, focusing on deliberate practice and seeking feedback from selected experts. I challenge my students, as part of their induction years, to set ambitious goals coupled with deliberate practice, feedback, and reflection. I encourage them to build a network of expert teachers in their building who can give them feedback on their practice. By being explicit about expertise development and drawing upon our pre-service teachers' prior experiences with developing expertise, we can help our pre-service teachers be more metacognitive about their own professional development.

Matthew's Implementation

On the first day of class, before students arrive, I (Matthew) place the table and chairs in a U-shape. I place my binder and pen on one side of the U to insure I have a spot that situates me as informally as possible. Typically, I have taught half of my incoming students before in a pre-methods course or they have talked with me in an advising role. As students gather, they typically are chatting and are comfortable in the familiar classroom and with each other. I welcome them to the course and tell them that we'll spend most of the time in our first class session introducing ourselves in both familiar and novel ways. I'll say something like:

Today we are going to introduce ourselves in a way that will help us to learn about each other in a context outside of a 'schooling' experience. We would like you to tell us the name you prefer to be called and what you are an expert at. I realize that some of you may not quite know what to say—so take a moment and think quietly about your expertise. If you need advice or guidance to confirm or support your expertise, text a good friend or family member. Sometimes they are better at spotting or acknowledging our own expertise! I too will share with you my expertise after everyone has the chance to discuss their expertise. I realize sharing your expertise is something you likely have never talked about in a classroom setting. Rest assured we will respect what expertise you claim and then we'll have some questions and conversations with you about your expertise. Along the way we'll learn lots

about each other and our expertise. Let's all spend a few minutes writing down your expertise in your notebooks and some of the highlights you want to share. [After a few minutes have gone by] Ok, who would like to start us off?

Typically, someone is quick to go first. I acknowledge the student, and his or her introduction and explanation begins. The introduction usually lasts less than three minutes. I take notes during that time, occasionally looking at the student talking and their classmates. I use this approach to help the class begin to understand that they are not there to talk to me but to each other. After the student finishes, I wait quietly, hoping/anticipating other students will ask questions. If questioning does not happen after about 30 seconds (yes, I really wait that long—it's awkward for them and they notice it), I tell them "Jane" is expecting a few questions from you about her expertise. Initially the questions are fairly direct and require short answers; examples include "Did you ever go to ___?" and "How long have you been doing ___?" Depending on the type of expertise, I'll have more or less to contribute.

I tend to ask questions about finances, resources, and concepts associated with the expertise. For example, Jane had expertise in roller skating. She competed at the state and national levels. I asked, "How much does a good pair of skates cost?" and "How many pairs do you own?" This helped to foster quite a few follow-up conversations on what one does with so many different pairs! During her introduction, Jane mentioned the type, quality, and design of the boot, plate, wheels, bearings, and toe stop. As Jane talked it became clear to the class that she thinks differently and talks differently about skating then the rest of us in the room. At one point I asked, "I haven't been skating in quite some time, I was never good at it, and would be a danger to myself and others if placed in a rink! Can you give us some pointers on how I can skate more skillfully?" I ask these sorts of questions sincerely (as classmates are smiling and nodding at my lack of skill!) but to also help the class understand how experts can help a struggling novice to literally just stay on their feet and keep moving.

As introductions continue, some of the examples of expertise have more pedagogical underpinnings than others. For example, Paula described her expertise in hosting parties. My sense was that classmates didn't entirely grasp how that could be an area of expertise. I asked everyone to jot down in their notebooks what are the two most important things Paula is going to say about hosting a great party. I told everyone that Paula would share her thoughts after all of us had a chance to write our predictions. Many students listed things like: have enough food, have lots to drink, have everything cooked, table set-up complete, and make sure the house is clean. Paula said her two most important things were knowing about her guests before they came and making sure once they arrive they felt comfortable and at home. Most classmates were surprised to hear her two most important tips for hosting a great party. As we unpacked her guidance, we began to understand that all experts first and foremost understand how to prepare for their activity so they can skillfully execute it. The activity leaves all of us appreciating each other in different ways.

As the semester progresses, we return to talk about constructs related to the process of expert thinking (Bereiter & Scardamalia, 1993) to anchor their thinking about how, as emerging professional educators, we can help others learn those similar thinking practices and processes. Throughout the course, we explore approaches to constructivism; questions, claims, and evidence; approaches to inquiry; introducing, developing, and mastering standards; lesson and unit planning; and reflections on their planning, teaching, and learning. Along the way we critique each other's work, participate in workshops to refine lessons, and draw upon our collective expertise in the planning process.

In a class session, midway through the semester, one student decided to prepare an instructional unit about sound. As the conversation developed and confusion arose about sounds, I asked "Debbie," our expert musician, how a trumpet makes a sound. Without hesitation, she said, "I vibrate my lips to make a trumpet sound—but I'm not going to show you now!" Many in the room were surprised to learn that all sounds are caused by vibrations. In this instructional moment, I helped students process how to more expertly think about instructional planning as they hadn't considered the possibility of leveraging the expertise of their classmates. Research identifies experts as flexible and often opportunistic in their planning process. Additionally, experts recognize patterns faster, engage in reflective practices, and can identify problems, work through existing ones, and find new problems to solve (Berliner, 2001; Bransford, Brown, & Cocking, 1999; Tsui, 2009).

During the semester I remind them that they are novice thinkers about teaching and learning; they need to ask questions of each other, their teacher in their field placement, and myself about how each of us go about effectively planning, teaching, critiquing, and reflecting. I also remind them that in their area of expertise they read, listen, and/or watch an array of resources to enhance and refine their expertise. I also make them comfortable with the notion that it's okay not to know something, but it is not okay to stay that way because they have a professional responsibility to learn and grow. I continue to make connections to expert ways of knowing and say things like; "How might an expert teacher approach this? What could we do to refine our approach to this lesson?" and "What do we understand to be the 'big idea' in this instructional plan?" These sorts of questions help preservice teachers looks for patterns, be reflective, and identify pitfalls with their instructional approach.

Preservice Teachers' Reactions

Pat's preservice teachers were interviewed by the fourth author about their experiences in the methods course and were asked to share their reactions to the expertise class discussion. In analyzing the interview transcripts, two common themes emerged: (1) the expertise discussion helped students gain new insights about their classmates, and (2) students were able to draw parallels between their expertise and developing expertise in teaching. In the following paragraphs we elaborate on these two themes, using pseudonyms for the students.

In regard to the first theme, the students had been in the same cohort for several years and knew each other fairly well. The expertise sharing discussion prompted them to share something from their personal lives that they had not previously shared in everyday conversation. One student's response reflects this theme:

We are a pretty small group, I think there is like ten of us in that class, so we know each other pretty well by now because we have been in so much together but I think it was interesting, a lot of the things that were presented I didn't know, we are still getting to know each other after all of this time. (Hope)

McKenzie echoed this sentiment, "Yeah, we already knew each other from last year, but this was like learning something completely new that we have never talked about with the others before." The interviews took place 1-2 weeks after the expertise discussion, and students were still referring to the discussion and acting upon that information. One student shared, "A lot of us still talk about that, and say 'You did this!' Like I did baking and people are like 'You should bring cookies' and actually in one of my classes, I'm making cookies" (Oona). In addition, students talked about the passion needed to become an expert. They saw passion as essential to the pursuit and eventual mastery of a skill. The expertise discussion gave students insight into their classmates' personalities and individual passions. "It was good to get to know each other and then you see everybody's different passions and how that has had an impact on them" (Oona). Overall, the students agreed that the expertise discussion gave them new insights about members of their cohort.

The second theme related to students' new understanding of developing teaching expertise as they drew parallels to developing expertise in other areas of their lives. Drawing upon their personal experiences and that of their classmates, students shared that they clearly understood the degree of time, energy, persistence, and passion needed to become an expert, and that these same requirements applied to becoming an expert teacher. "Everyone goes through the same process [to become an expert]" (Ben). One student focused on the aspect of passion. "Hearing why I like photography, made me think why I want to teach . . . what I'm passionate about" (Julie). Another student focused on the amount of time needed to become an expert. "It's not just this little tiny flip, one day I'm an expert teacher, but it's a process" (Jamie). The students felt empowered through the realization that developing expertise is a long process. "I thought it was nice to be able to compare something that I do feel really good about to something that I am still terrified of" (Meera). Overall, the students were empowered and hopeful. "It was relating it to something you are an expert in, and relating it to something that you hope to be an expert in" (Tamara). Students realized that they will not be experts when they graduate, but that expertise is achievable over time. "That was really neat to see, to take everybody's different area of expertise and then apply it to one common goal, which we all want to reach as expert teachers" (Ben).

Conclusion

In our overall approaches to the initial lesson and subsequent experiences, we make our students consciously aware of how much certainty and clarity of vision they have or do not have in their instructional planning, delivery, and reflection. Along the way, we help our students to professionally notice like expert teachers notice. David Baume (2004) refers to this as “Reflective Competence,” where the teacher looks to the outside (insights from resources and other experts, ideas from their own students, and revisiting their own written self-reflections) to ask themselves how they can use their refined practice to enable learners to have awareness of expertise-like patterns of thinking and action. This process of helping our preservice students recall their experiences within levels of expertise helps our preservice students begin to understand what it takes to help others learn and grow.

We have our students reflect on the skillfulness of their self-identified expertise and also remind them they do not yet possess expertise in the teaching of science. In many ways, it is a relief for our students to hear this message. It allows our students to reflect on their own area of expertise during the moments they exercised stamina and tenacity to become skillful. We then encourage our students to be mindful of those same moments and apply those insights early and often as they begin their careers as science teachers.

We recommend this lesson because it causes preservice teachers to share and reflect on how they have developed expertise in their personal lives in relation to how they must ultimately develop new expertise as science teachers. It is our hope our preservice teachers will remember these discussions and activities when feeling consciously unskilled and/or when they consider leaving the teaching profession. While the long-term effect of this expertise lesson to promote retention is unknown at the present time, this lesson does address the issue of helping a novice teacher of science understand that having teaching expertise requires persistent attention to and awareness of developing one’s skills through intentional reflection on their existing and emerging expertise.

Supplemental Files

References

Adams, L. (n.d.). Learning a new skill is easier said than done. *Gordon Training International.* Retrieved from http://www.gordontraining.com/free-workplace-articles/learning-a-new-skill-is-easier-said-than-done/

Baume, D. (2004) in Chapman, A. (2016). Conscious competence learning model matrix-unconscious incompetence to unconscious competence. Retrieved April 24, 2016, from http://www.businessballs.com/consciouscompetencelearningmodel.htm

Bereiter, C., & Scardamalia, M. (1993). *Surpassing ourselves: An inquiry into the nature and implications of expertise*. Illinois: Open Court.

Berliner, D. C. (2001). Learning about and learning from expert teachers. *International Journal of Educational Research, 35*, 463-482.

Berliner, D. C. (2004). Describing the behavior and documenting the accomplishments of expert teachers. Bulletin of Science, *Technology & Society, 24*, 200-212.

Bransford, J. D., Brown, A.L., & Cocking, R.R. (1999). How experts differ from novices. In Bransford, J.D., Brown, A.L., & Cocking, R.R. (Eds.). *How People Learn: Brain, Mind, Experience, and School* (pp. 19-38). Washington DC: National Academy Press.

Glaser, R. (1996). Changing the agency for learning: Acquiring expert performance. In A. Ericsson (Ed.) *The road to excellence: The acquisition of expert performance in the arts and sciences, sports, and games* (pp. 303-311). Mahwah, NJ: Lawrence Erlbaum Associates.

Ingersoll, R. (2003). *Is there really a teacher shortage?* Seattle, WA: Center for the Study of Teaching and Policy, University of Washington. Retrieved from https://depts.washington.edu/ctpmail/PDFs/Shortage-RI-09-2003.pdf

Ingersoll, R. M. (2012). Beginning teacher induction: What the data tell us. *Phi Delta Kappan, 93*(8), 47–51.

Tsui A. B. M. (2009). Distinctive qualities of expert teachers. *Teachers and Teaching: Theory and Practice, 15*, 421-439.