


Core Pedagogy: Individual Uncertainty, Shared Practice, Formative Ethos

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Abstract

Attention to the core practices of teaching necessitates core pedagogies in teacher preparation. This article outlines the diffusion of one such pedagogy from medical to teacher education. The concept of clinical simulations is outlined through the lens of “signature pedagogies” and their uncertain, engaging, formative qualities. Implemented in five different teacher preparation programs, simulation data highlight design principles and resulting outcomes for general scholastic and subject-specific problems of practice.

Keywords

practice-based teacher education, problem-based teacher education, teacher induction, teacher learning

As an Emergency Room (ER) nurse, my mother worked the 3:00 to 11:00 p.m. shift in a county hospital. On occasion, my father, sister, and I sat in the waiting room until she had a chance to join us for an evening meal in the hospital cafeteria. I was never bored while waiting. Ambulances dispatched, helicopters landed, and I had an unobstructed view of the public in crisis. ER work is unpredictable. My mother and her colleagues never quite knew who was going to show up at the ER door, and in what condition. One thing was certain, though. ER nurses were expected to act quickly. They often triaged, responding to the conditions of addicts, accident victims, and abusive relationships with ethical, decisive judgment. Many of their actions and communications were routine standards of care, well rehearsed and to which everyone was held accountable. Gloves were mandated, interventions were documented, and mortality rates were examined.

As a young teacher in a family full of nurses, I grew to understand that medicine and teaching share a sense of professional uncertainty. Responding to the unknown and unexpected, nurses and teachers engage and serve the broader public. Through experience, mistakes, and appropriate professional challenges, they form increasingly mature, reasoned, and professional identities. Through these tenets of practice—uncertainty, engagement, and formation—novices learn their professions’ actions, communications, and measures of accountability.

This article outlines the concept of clinical simulations as a core pedagogy within teacher education. I begin with a description of simulations in medical education, and the design framework (Barrows, 1987, 2000) that guides the construction and selection of medical simulations for use in the preparation of physicians, nurses, and physical therapists. Then, I outline recent attention that scholars have given to

core practices in classrooms and the need for core pedagogies in teacher preparation. From that impetus, I describe a clinical simulation model, its use within five different U.S. teacher preparation institutions, and data excerpts from those implementation sites. This broad background on simulations—originating within medical education, called for by teacher educators, and implemented across different teacher education contexts—sets the stage for this conceptual article: clinical simulations as a core pedagogy of uncertainty, engagement, and formation (Shulman, 2005a, 2005b).

Medical Simulations With Standardized Patients

In 1963, Howard Barrows began using standardized patients to enhance the preparation of medical residents at the University of Southern California. Standardized patients are lay persons, actors, or real patients, who are carefully trained to present distinct symptoms and communicate questions/concerns to future medical professionals in a standard, consistent manner (Barrows, 1987, 1993, 2000; Barrows & Abrahamson, 1964). Face-to-face with the standardized patient in the exam room, each medical resident was challenged to move beyond a traditional, distant analysis of a “case.” Instead, each resident had to conduct a diagnostic assessment, thoughtfully communicate with the patient, and construct a plan of action or regimen of treatment. As the

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concept grew and diffused to other medical preparation institutions, Barrows outlined a framework for simulation design. His design tenets—*prevalence*, *instructional importance*, *clinical impact*, and *social impact*—supported selection and implementation decisions, helping determine when and how cohorts of medical residents would engage with specific simulations in their programs of study. For example, Barrows's *prevalence* tenet outlines the use of simulations (in the preparatory environment) that mirror the common challenges medical personnel would likely encounter later in practice. In contrast, the *clinical impact* tenet suggests simulating a situation that might be experienced rarely in medical practice, but that presents a variable of great importance or has a potentially high impact if it is overlooked or mishandled by the professional. The *social impact* tenet focuses on simulations that have a particularly strong impact on an individual or group, while the *instructional importance* tenet supports simulations that focus on different or very specific skill sets (Barrows, 1987). Since 1963, the use of standardized patients in medical simulations diffused across the medical preparation community. Today, medical simulations are used as a pedagogy to teach—and an assessment tool to measure—the diagnostic and interpersonal skills of future physicians, nurses, and physical therapists (Coplan, Essary, Lohenry, & Stoehr, 2008; Hauer, Hodgson, Kerr, Teherani, & Irby, 2005; Islam & Zyphur, 2007).

From Medical to Teacher Education

Increasing attention is being given to core practices that effective teachers use in classrooms (e.g., Ball & Forzani, 2009; Ball, Sleep, Boerst, & Bass, 2009; Grossman, Hammerness, & McDonald, 2009; Kazemi, Lampert, & Franke, 2009; Lampert & Graziani, 2009). These scholars propose that teaching involves a set of fundamental practices that can help all students learn (Forzani, 2014)—including but not limited to how teachers facilitate discussions with students, engage effectively with parents/caregivers, scaffold instructional moves to advance student thinking, foster effective learning environments, plan for instruction, and evaluate student work (Ball & Forzani, 2009; for example, TeachingWorks). This focus on core practices rests on three assumptions, two of which appropriately encourage teachers' primary attention to curricula/content and student academic performance. The third assumption, though, is noteworthy in its acknowledgment that teaching is "a partially improvisational practice . . . and that novices must be trained to manage the uncertainty" (Forzani, 2014, p. 3).

As the focus on core practices has grown sharper, so has the emphasis on practice-based teacher education (Zeichner, 2013). In particular, scholars are examining how teacher candidates can best learn about, rehearse (Grossman, Hammerness, & McDonald, 2009), and enact the core practices essential to teaching and student learning. If effective teachers should use core practices to guide student learning,

then how will preservice teachers (PSTs) learn these core practices (Levine, 2010; Singer-Gabella, 2012)? To support core practices in classrooms, what *core pedagogies* should be implemented in teacher education (McDonald, Kazemi, & Kavanagh, 2013)? In the same way that core practices focus on discrete, specific actions of teachers, Lampert (2005) argues that specific, discrete learning environments be designed to help PSTs focus on the detailed components of teaching. Grossman, Hammerness, & McDonald (2009) suggest one such environment: "Think, for example, of the simulated patient experience that many medical students encounter in their training" (p. 285).

Clinical Simulations in Teacher Education: Model and Implementation Methods

In 2007, I learned of nearby SUNY Upstate Medical University's (UMU) use of standardized patients and simulations within its medical preparation programs. UMU's Clinical Skills Center sits a short distance from Syracuse University (SU), and the school of education in which I serve. Working from Barrows's (1987) design tenets for medical simulations, I constructed and implemented SU's first clinical simulations, situating PSTs in front of standardized individuals (SIs). The term *standardized* references the training of multiple actors to embody a specific individual (e.g., a parent, student, community member, etc.). Making the actors' verbalizations, nonverbal mannerisms, and contextual information *standard and consistent* provides cohorts of PSTs the opportunity to engage within the same professional situation, hear the same questions and concerns, and navigate the same calls for action and response (Dotger, 2010).

Early simulations were developed, and continue to draw directly, from the input of experienced teachers (i.e., 10+ years of instructional experience), professional literature (e.g., Barab & Duffy, 2000; Borko, Jacobs, Eiteljorg, & Pittman, 2008; Epstein & Sanders, 2006; Grossman et al., 2009; Grossman, Hammerness, & McDonald, 2009; Korthagen & Kessels, 1999; Lawrence-Lightfoot, 2003; Putnam & Borko, 2000), Barrows's (1987, 2000) four design tenets, and the direct requests of PSTs (Dotger, 2011a). Ultimately, the authenticity factor—how closely a simulation mirrors a scholastic problem of practice—serves as the final litmus test for whether or not a simulation is brought to fruition.¹

In a simulation, the objective is to challenge a PST to engage, make decisions, and communicate as the licensed teacher she or he is preparing to become, working directly with the (standardized) student or parent sitting at the table to address her or his scholastic and sociocultural contexts, questions, and concerns. Clinical simulations extend well beyond simple role-plays, where winks-and-nods between role-players suggest a less serious, less authentic approach

that eventually overtakes the learning experience (Dotger, 2011b). Instead, simulations are designed to serve as close “approximations of practice” (Grossman et al., 2009, p. 2076), where PSTs can authentically engage. The use of SIs (e.g., students, parents, paraprofessionals, community members) in simulations does not suggest that all students are the same or that there is a single approach to working with parents. Instead, clinical simulations are designed to help PSTs experience a breadth of situations and perspectives. Simulations are “clinical”; they occur in a designated setting (Lampert, 2005) and under camera lenses to allow PSTs and guiding faculty the opportunity to carefully analyze the resulting data.

To situate the PST in an authentic environment, I carefully direct the SI but not the PST. Two different protocols support a clinical simulation—one for the PST and a different one for the actor serving as the SI. The Teacher Interaction (TI) protocol is given to each PST one week before a simulation, and provides significant general background and subject-specific context. The objective is to give PSTs enough relevant information to situate them in the simulated environment, without placing them in any deficit position at the onset. After consulting the TI protocol, but prior to a simulation, PSTs sometimes inquire, “What should I say if . . . ?” or “What do I do if . . . ?” Simulations are crafted to give PSTs opportunities to synthesize and practice enacting what they have learned about teaching. To guard against prescribing or influencing their actions, decisions, or communications, I simply encourage them to engage within the simulation and with the SI using their prior training and professional judgment.

In contrast, the SI protocol is designed quite differently, and very specifically structures and directs the SI. Each SI protocol gives extensive character-building information to the actor serving within the simulation. This information is followed by specific *triggers*—the exact statements, questions, background, and nonverbal mannerisms that each actor must present and embody. For a given simulation, training of three to five SIs occurs at UMU’s Clinical Skills Center approximately one week before implementation, lasting approximately 1.5 hr.²

To illustrate the simulation concept, consider how PSTs might engage within the *Lori Danson* simulation, where Ms. Danson is a proactive mother of a student with autism. In this simulation, we situate each PST in front of an actor portraying Ms. Danson, who has requested a conference with the teacher (i.e., the PST) before the school year begins. By design, Ms. Danson initiates early portions of the conversation, indicating that her son is autistic and will soon be enrolled in the teacher’s classroom. Ms. Danson reports her son’s strengths and challenges, and gives extensive account of his past experiences in different school settings. Then, she shifts the conversation, asking questions about the teacher’s knowledge of autism and strategies for including her son in the classroom. In response, PSTs have opportunities to

describe their perspectives on working with students with disabilities, including their strategies for community building, management of student progress, and communication with parents.

This simulation and others are implemented within UMU’s Clinical Skills Center, a 22-room medical simulation facility with recording equipment that captures the audio and video of each PST’s simulation.³ By design, the actual clinical simulation is an isolating experience; the PST is the only professional in the simulation room, and is solely accountable for his or her actions, decisions, and verbalizations. After the simulation concludes, PSTs are given digital access and/or disk copies of their respective videos, and are charged to deconstruct their performances. In this process, PSTs identify short, 1-min segments of video to share with peers. The cohort of PSTs experienced the same professional challenge—conversing with Lori Danson—but each individual PST was free to engage in the simulation using her or his knowledge base, professional reasoning, and skills. When the cohort gathers one week later, PSTs display their video segments on a large projection screen, describing the successes and struggles they have identified in their videos. All are focused on the same shared learning experience, and are busy discussing and debating their various professional approaches to the same problem of practice.

At the time this article was constructed, SU elementary and secondary PSTs ($n = 512$) had engaged in 30 different general education and subject-specific simulations. At SU, simulations have been implemented through an elective course format, in support of traditional teacher education “methods” courses, and incorporated within student teaching seminars. In addition to SU, four other teacher preparation programs—located at Eastern University (EU), Southeastern University (SEU), and two Midwestern Universities (MUs)—have recently implemented simulations designed at SU. Table 1 shows the course context, participants, simulations implemented, and their design tenet(s).

At each implementation site, the same clinical simulation concept was enacted—PSTs engaged one-to-one, face-to-face with SIs, their interactions were recorded, and they later analyzed their own video data. SI training for the simulations at EU and MU occurred using the exact documents developed and facilitated at SU. To support MU’s implementation, I conducted a 2-hr Skype videoconference with actors recruited by the Director of Midwestern Medical College’s Clinical Skills Center. Although done virtually, this process mirrored the same training that I regularly conduct at SU in conjunction with actors recruited by UMU’s Clinical Skills Center. When training was complete, MU PSTs engaged with standardized parents and students, using Midwestern Medical College’s simulation rooms.

To support EU’s implementation, my UMU colleagues and I traveled with six SIs to an EU satellite campus that housed basic classroom facilities but did not offer medical simulation rooms with recording equipment. We improvised

Table 1. Implementation Site and Simulation Information.

Institution and implementation site	Context	<i>n</i>	Simulation name and (Design tenet)
Eastern University (EU) Large, suburban, research-intensive CMU actors recorded with iPad technology	Post-baccalaureate STEM teacher preparation program—Secondary Education (Teacher Inquiry course)	<i>n</i> = 11	Iconic Interpretation (Instr. Imp.) Density (Prev.) Natural selection (Instr. Imp.) Algebraic equations (Prev.)
Midwestern Universities (MU) Two small, rural/suburban teaching intensive universities Partnership with nearby Midwestern Medical College's (MMC) Clinical Skills Center	Initial teacher preparation program—Elementary and Secondary Education (Teaching Methods course)	<i>n</i> = 18	Jim Smithers (Cl. & Soc. Impact) Casey Butler (Cl. Impact)
Southeastern University (SEU) Large, urban, research-intensive Partnership with SEU College of Medicine's Clinical Skills Center	Initial teacher preparation program—Secondary Education (Social Foundations course) (English Education seminar)	<i>n</i> = 19 <i>n</i> = 8	Jenny Burton (Prev.) Corinne Hammond (Instr. Imp.) Ashley Wilson (Prev.) Writing Process
Syracuse University (SU) Large, urban, research-intensive Partnership with SUNY Upstate Medical University (UMU)	Initial teacher preparation program—Elementary and Secondary Education (Parent–Teacher Communications course) (English, Music, Science, Mathematics, Physical Education seminars) (Secondary Education Foundations course)	<i>n</i> = 512	Donald Bolden (Cl. Impact) Angela Summers (Cl. Impact) Elizabeth Meyers (Cl. & Soc. Impact) Jim Smithers (Cl. & Soc. Impact) Jenny Burton (Prev.) Ashley Wilson (Prev.)

Note. All simulation names are fictional identifiers and do not represent specific individuals.

by temporarily providing PSTs with designated iPads, using the simple recording feature to capture simulation data. EU PSTs engaged in mathematics or science simulations, reviewed their video data on their respective iPads, and then connected their iPads to a video projector during the whole-group debriefing, allowing the entire cohort to examine simulation video segments.

SEU faculty chose three of SU's simulations and utilized their own College of Medicine's Clinical Skills Center to recruit SIs. SEU faculty facilitated their own SI training sessions. Later, SEU faculty reported that they implemented one of the three simulations verbatim. For the other two simulations, SEU faculty adjusted the SIs' marital status and disposition (e.g., increasing the SIs' degree of anger in simulation) but reported not making any changes to the verbal triggers each SI would issue in simulation. Using SU's different simulation protocols as a template, one SEU faculty member constructed and implemented a new simulation that situated English/Language Arts PSTs in front of a standardized student who presented writing process questions and struggles (SEU personal communication).

This article does not focus on a specific study across these five preparation contexts. Instead, I highlight the history of clinical simulations, the simulation model, and data excerpts from the five schools/colleges of education to illustrate clinical simulations as a core pedagogy within teacher education.

The remainder of this article outlines the uncertain, engaging, and formative qualities of clinical simulations, grounded in Lee Shulman's (2005) description of "signature pedagogies" across the professions.

Pedagogies of Uncertainty, Engagement, and Formation

In recent forums, Lee Shulman (2005a, 2005b) described "signature pedagogies" in the professions of law, medicine, engineering, and the clergy. He referenced specific pedagogies as signatures of their professions, because they were pervasive and routine in those preparatory contexts. Looking across these professions, Shulman noted signature pedagogies foster "uncertainty, engagement, and formation" in their respective novice professionals (Shulman, 2005a, n.p.).

In 2005, Shulman outlined these three pedagogical tenets—uncertainty, engagement, and formation—in a speech at a Math/Science Partnership workshop. As a trio, these tenets ultimately position signature pedagogies as "pedagogies of action" (Shulman, 2005a, n.p.). The transcript of Shulman's speech does not disguise his very telling transition at this point, which must have been even more apparent through his live delivery. Shulman closely follows his "pedagogies of action" statement with, "One of the things that strikes me as a teacher educator is that it's very very

difficult for me to find the signature pedagogies of teacher education” (Shulman, 2005a, n.p.). He continues, calling for a “suite of signature pedagogies that are routine, that teach people to think like, act like, and be like an educator” (Shulman, 2005a, n.p.).

I return to the use of clinical simulations in teacher education, examining the connections of this pedagogy to Shulman’s tenets of *uncertainty*, *engagement*, and *formation*.

“Woo, That Was Crazy!”: A Pedagogy of Uncertainty

Citing medical education’s use of clinical rounds, Shulman describes how signature pedagogies increase student visibility and accountability. When a few medical students and residents engage in rounds and discuss a particular patient, everyone is held accountable for contributions toward a diagnosis and discussion of treatment options (Shulman, 2005a, 2005b). In essence, every person—regardless of seniority or status—is in the limelight and expected to perform. This increased visibility does not allow medical students or their thinking to hide, and therefore fosters professional uncertainty: “a sense of risk . . . a sense of unpredictability . . . a sense of anxiety” (2005a, n.p.). Clinical simulations generate and gradually reduce professional uncertainty in PSTs. This disequilibrium manifests and dissipates on at least two different fronts—the nuanced uncertainty associated with simulated situations that PSTs encounter and the broader uncertainty associated with analyzing one’s own teaching practices.

Uncertainty through distinct simulated situations. The first uncertain front emerges through the unanticipated demands of specific simulations. Novice teachers—individuals within their first three years of practice—often reference a “gap” between the sheltered nature of teacher preparation and the unguarded challenges of daily practice in classrooms (Korthagen & Kessels, 1999). This is the Piagetian (1959) concept of disequilibrium in action, where there is a mismatch between what novice teachers expect to happen and what they actually experience. One reason for this disequilibrium is that novice teachers have limited professional foresight and do not anticipate or understand the challenges until they become enveloped in them. Other times, novice teachers do anticipate the problem of practice, draw from their own school experiences as they prepare, but incorrectly predict a classroom exchange will occur in a manner similar to past experience. The disequilibrium arrives when the challenge unfolds differently, and the novice teacher actually encounters a new, unfamiliar outcome. Uncertainty results from a “violation of expectations” (Shulman, 1998, p. 519) but fosters real learning about teaching as the novice works through the unknowns, reorients, reconfigures, and equilibrates.

In this spirit, clinical simulations bring to life many different uncertain fronts and professional unknowns. The intent is to introduce elements of professional risk and anxiety, illuminating some of the challenges of teaching and working within schools that PSTs might not otherwise experience *before* obtaining licensure and entering those novice years of practice. The uncertain fronts that simulations illuminate are grounded in Barrows’s (1987, 2000) design tenets for medical simulations—*prevalence*, *instructional importance*, *clinical impact*, and *social impact*.

Each simulation is designed in accordance with one of Barrows’s four tenets. For example, consider the colorful statements made every day in high school hallways, and the uncertainty teachers—at any career stage—feel when they hear students threaten violence or aggression. Novice teachers are often unsure if and when to confer with aggressive students, and if choosing to do so, what should be said. The *Casey Butler* simulation places PSTs in this exact situation, where they navigate how and to what degree to engage Casey when she threatens, “I hate her; I’m going to kick her ass!” This simulation is rooted in Barrows’s tenet of *clinical impact*. Directly engaging with a student who threatens physical violence may be a more or less prevalent situation for licensed teachers. Mishandling the situation—not giving Casey’s words appropriate consideration or grossly overreacting to her outburst—holds potentially high consequences for Casey and the health/safety of other students.

To illustrate the uncertain front this particular simulation introduces, consider the responses of MU PSTs immediately after their face-to-face conversations with Casey:

I accomplished the goal of warning her about actions and consequences. However, I didn’t really get to the root of the issue. She was very quiet. I guess I should have asked more personal questions, but she didn’t want to talk. Even when I asked why she was frustrated, she just wanted to talk about the girl on the bus. I should have asked more about her life.

This PST’s expressions of uncertainty include questions about questioning, or getting to the “root of the issue.” The PST also struggles with how to direct the conversation more toward Casey and her concerns, and away from the actual event that sparked Casey’s reaction. Experiencing the same response patterns from Casey, another PST reflected on how her uncertainty shaped the remainder of the interaction:

I think that in my mind, because she was so shut off, I instantly started to shut down more than I thought I would. So, I didn’t get as far as I planned. I think I let my nerves get in the way.

Additional data from the MU cohort suggest early explorations with a core practice, *Engaging in strategic relationship-building conversations with students* (TeachingWorks,

2014, n.p.). Three PSTs' reflections indicate their uncertainty in structuring and setting the tone of such a conversation: "What's a good range of being strict or nice? Because you don't want to be too strict or too nice" and "Maybe there is a better balance of authority and connecting on a more personal level?" Citing a desire to triage her conversation, one PST asked plainly, "What is the priority of enforcing the rules vs. knowing the student? So what, really, is the priority of the teacher?" Finally, one PST reflects on the different responsibilities of a teacher, and the pull she felt to balance them: "The job of a teacher has so many tasks. I stayed up late working on aligning standards to my assessments, and then I just talked to a girl (Casey Butler) whose last thought was standards."

To further illustrate the uncertainty that emerges through simulations, we turn to Barrows's tenet of *prevalence* and two other simulations—*Jenny Burton* and *Ashley Wilson*. In these different simulations, the standardized mothers present PSTs with broader situations and specific statements they can expect to encounter with reasonable frequency as licensed teachers. SIs who enact *Jenny Burton* are trained to say, "You're telling me my son is struggling with grades and not behaving. I'm not sure how to help. What is it I can do at home?" In a separate simulation, SIs who enact *Ashley Wilson* share evidence with each teacher about how her son is being physically harassed at school. Unlike *Jenny Burton*, who questions how to support her son at home, each *Ashley Wilson* focuses on actions to be taken on school grounds: "How do we handle this so that the bullying stops but it doesn't look like 'mommy came to the rescue?'" These procedural, "next step" types of questions are common across several simulations and are introduced to help PSTs envision one prevalent aspect of their profession—supporting student well-being—and the courses of action this requires. Finally, other simulations are based on Barrows's *instructional importance* tenet, introducing uncertainty by focusing on specific skill sets. In the *Natural Selection* simulation, Science PSTs work with a standardized student who struggles with two distinct misconceptions about the evolution of species. This situation requires PSTs to use questions that interrogate and surface student knowledge and misunderstanding, and to also utilize biological examples accurately and clearly to clarify the student's misconceptions.

This first front of uncertainty—the sheer number of issues a teacher encounters—is one reason novices cite a gap and exclaim, "Why wasn't I prepared for *that*!?" Singer-Gabella (2012) argues, "Candidates must gain both familiarity and experience with not only the prototypical but also the hybrids and exceptions" (p. 9). In similar fashion, Grossman and McDonald (2008) suggest research on situations that PSTs will be held accountable for as licensed teachers but for which they received no exposure through traditional field experiences in their preparation programs. Despite the most earnest partnerships between teacher educators and school districts to facilitate quality field placements, neither party

can ensure that PSTs will engage in similar instructional experiences. There are few structures to ensure that all Science PSTs will engage in "x" practice, or that all Social Studies PSTs will gain "y" experience; field placements vary too greatly. When a PST engages in a very formative experience with a student, parent, or paraprofessional, she or he is very often alone in that experience, and its benefits do not diffuse to the broader cohort of PSTs. As a pedagogy, simulations introduce uncertainty to PSTs by introducing them *all* to situations that mirror prevalent (i.e., "prototypical") future practices, or interactions that require distinct skills and have unique impact (i.e., the "hybrids and exceptions"; Barrows, 1987, 2000; Singer-Gabella, 2012).

Placing PSTs within discrete situations—and the uncertainty that accompanies those situations—helps teacher educators expose and ultimately reduce "I had no idea!" response patterns from novice teachers (Dotger, 2010). Experiences in simulations of *prevalence*, *impact*, and *instructional importance* are expository in nature; they help PSTs see themselves within—and develop professional foresight toward—the broader circumstances and situations of the profession and the complex public they will serve. PSTs' disequilibrium and uncertainty eases as their experiences grow in breadth and depth, and their professional reasoning grows more complex and integrated (Piaget, 1959; Reiman & Peace, 2002). Transitioning into their induction years, novice teachers have experienced—through simulation—some of the different situations and uncertainties associated with licensed practice.

Easing uncertainty through visible practice. The second uncertain front stems from analyzing one's professional practices. As Singer-Gabella (2012) encourages, "products of scholarship must make visible not only the consequences of a scholar's choices, but also the contextual particulars in which reasoning and action are invested" (pp. 15-16). In traditional forums, it is very difficult to make visible one's student teaching experiences, when no other peers in the room have actually been in that classroom or worked with that student. In contrast to the traditional seminar, the *simulation as a shared learning experience* allows each PST to experience the same "contextual particulars" and later, in debriefing, makes each PST's actions visible. When a cohort engages in the group debriefing that follows each simulation, each PST is familiar with and invested in the variables displayed on screen; each understands the problem at hand and what was challenging about that particular parent, student, or paraprofessional. In simulation, when a single mother indicates that she does not see her teenage son often because she works two jobs, each PST hears these words and must decide if and how to respond. By itself, this verbal trigger yields a wealth of PST beliefs, perceptions, and approaches to single parents and family structures. Speaking to the situated nature of case study, Shulman's (1998) words apply to the shared practices and shared analyses that result from a simulation: "We

render individual experiential learning into ‘community property’ when we transform those lessons from personal experience into a literature of shared narratives” (p. 520). Transitioning from the simulation that all PSTs experienced as individuals, the data-informed debriefings draw them together as a collective “community of practice” (Wenger, 1998), where they share in the analysis of their individual responses. As a broader community, PSTs begin comparing and contrasting their expectations, perceptions of, and approaches to the single parents of the students they teach.

To illustrate this communal practice, we return to EU’s cohort of mathematics and science PSTs to briefly examine how their individual vulnerability and uncertainty in simulation begins to shift toward collective reassurance. In a group debriefing, these PSTs watched each others’ video segments, often responding with sentence stems that suggest mutual investment: “Oh see, I didn’t think of that . . .”; “I like how you did . . .”; and “When (the standardized student) said that to me, I was thinking . . .” As noted by one PST,

It (debriefing) inspired camaraderie even more so than we already have. Not that it made me feel ok that I made mistakes or that I don’t know enough, but it made me feel like we are all in this together, and we are all learning and growing as teachers.

Shulman (2005a) references pedagogies that inspire “accountable talk” (n.p.) among students, working to “build on each others’ work” (n.p.). This communal, collective investment is evident in another EU PST’s words: “What I liked most was the group connection that developed further as we all shared our mistakes. I like how we confided in each other, and how we all tried to learn from each other.” The vulnerability and uncertainty associated with displaying the video of one’s practices in simulation—where mistakes, decisions, and consequences are visible and sometimes awkward—reassures, fosters trust, and builds professional cohesiveness. As PSTs watch each other struggle and succeed with the very same problem, community equilibrium eases individual uncertainty.

Clinical simulations present two uncertain fronts: They expose PSTs to the problem-specific uncertainty of “not knowing what to do!” in a discrete situation. Importantly, though, they assuage some uncertainty through the individual and collective analysis of practice. As a pedagogy of uncertainty, simulations expedite the unknowns of learning through (situated) experience and offer community support to the emerging professional.

A Pedagogy of (Limited) Engagement

Shulman (2005a, 2005b) emphasizes the active nature of signature pedagogies and the fundamental expectation of praxis. Through signature pedagogies, students realize that simply being present and accounted for will no longer suffice, and action is expected. The situated nature of clinical

simulations (Brown, Collins, & Duguid, 1989; Lave & Wenger, 1991) is a foundational construct. Individual PSTs operate *in situ* (Brown et al., 1989) through face-to-face interactions with another human being, who presents distinct questions, information, concerns, and sociocultural contexts. These simulated situations do not allow PSTs to distantly reflect on professional readings, nor do they serve as a forum for the PST to simply observe the professional actions of other, licensed teachers. There is no opportunity to hide among the crowd and depend on peers to deflect questions from the professor. Instead, simulations quickly shift teacher preparation from what the PST knows to what she or he can and will actually do. The impetus to engage occurs when the standardized student, parent, or paraprofessional knocks on the simulation room door. Each PST is held accountable from that point forward, from how he or she welcomes the SI into the room up to the point where they conclude their interaction.

Shulman emphasizes the *engagement tenet*, noting that as learners serve within pedagogies that mirror the demands of their professions, they learn “how to act under conditions where knowledge is limited yet actions must be taken” (Shulman, 2005b, p. 2). Clinical simulations fulfill Shulman’s *engagement* requirement but do so by presenting an environment that has boundaries. As *limited, bounded engagements*, simulations intentionally reduce the complexity of everyday school environments (Grossman & McDonald, 2008), clearing away noisy intercoms and constant interruptions from others. The boundary setting nature of a clinical simulation—where only a discrete challenge is present—helps the PST focus during the simulation.

Importantly, simulation boundaries further focus PST cohorts in their post-simulation analysis of practice. In traditional student teaching placements, PSTs’ days are ones of constant engagement. They often leave their field placements at the end of the day with many points of practice that they should analyze but are too exhausted and isolated to do so. In contrast, when PSTs exit a simulation, they have one focal point of practice—how they navigated the interaction with the SI. Their simulation video data serve as the lenses. This analysis of video data differs from the traditional requirement that student teachers video record and reflect on classroom instruction. The difference is the shared nature of a discrete simulated practice; each PST has video evidence of how he or she navigated the questions of a standardized mother or the concerns expressed by a standardized student.

To illustrate the ways in which PSTs focus on and analyze their own and peers’ simulation data, consider EU PSTs’ experiences with two mathematics and science simulations. Following their simulations, these PSTs had brief opportunities to individually analyze and then collectively share their data. After only 30 minutes with their data, PSTs’ early understandings of their instructional approaches begin to emerge: “I think the way I learn and remember things may not work for other students. I already knew this, but listening

to myself give a student study tips really cemented the idea.” After reviewing their simulation videos, some openly acknowledge gaps in conceptual understanding:

I need to know more about Natural Selection. This has really been bothering me. I saw how some of my fellow classmates gave examples in their simulations and that gave me great ideas for the future (because they were pretty awesome).

Another PST identified the difference in what she perceived as a successful message and the actual off-topic message evident on video: “There were a few times where, in my head I wanted to say one thing and I thought I was at the time, but after watching the video, I was not saying anything close to what I thought I was.” Another EU PST acknowledged the instructional difficulty of transferring what she understood (as the teacher) into an approach that results in student learning: “I knew both of these topics, but actually explaining them to another student for some reason became a little confusing.”

As SU mathematics PSTs engaged in the same mathematics simulation (*Iconic Interpretation*), their analyses reflect those of EU PSTs and highlight the core practice of providing feedback to students (TeachingWorks, 2014). Referencing the frequency and clarity of her communication with the standardized student, one PST reflected,

I think I did ask good focusing questions but I also think that in certain times I like to question a student’s thinking even if she’s right . . . and I think I do that too much, ’cause then they come to expect they’re wrong when they’re right, but I just want them to justify why they’re right. So, maybe I should start with “yeah, this (is) right,” but instead I’m just kind of like, “So, why is this right?” and they’re like, “Is it?” (Dotger, et al., 2014).

Another SU PST further highlighted his instructional nudge of student thinking, reflecting, “I probably funneled her a little bit. Like I said, ‘Okay, now where would we put this point?’ you know, instead of saying like, ‘which point would we change?’” (Dotger et al., 2014).

When Shulman (2005b) emphasizes engagement, he notes that professionals must take action at times when they do not know all there is to know. Rarely in practice will licensed teachers know a student’s full background or understand all the histories, complexities, and qualifications of a particular subject. Teacher educators are familiar with a similar concern, as PSTs often inquire how they will teach successfully when there is so much content they have yet to learn. Simulations are bounded—a SI presents a distinct set of questions or concerns—but they are not so structured that they point to the one and only instructional path or professional response the PST should enact. Thus, the real challenge in a simulation is for the PST to determine what is and is not known about the situation at hand; activate her or his own, still limited, professional knowledge; and synthesize these two limited sources of knowledge into action steps.

With all PSTs engaging in the same simulation, and later collectively sharing data excerpts in debrief, opportunities emerge to examine sources and limitations of knowledge. Here lies the opportunity to illuminate what knowledge and limitations the PSTs attended to in the *Natural Selection* simulation, when the student expressed a misconception about “survival of the fittest.” Here lies the opportunity for PSTs to examine and constructively critique their explanations and affirmations (e.g., “Right?”) in the *Iconic Interpretation* simulation, where teacher response patterns may or “may not work for other students.”

Through the pedagogy of clinical simulations, PSTs experience the demands of a specific instructional challenge but do so in an environment that holds constant many of the other complexities associated with one’s novice years of teaching. The boundaries of this *pedagogy of engagement* provide all PSTs the opportunity to interact with the same problem of practice, and later unpack the professional limitations of what they said and did in situ. As each PST’s strengths and limitations are illuminated, elements of teacher identity and disposition emerge.

A Pedagogy of Formation: Identity and Disposition

In group debriefings, PSTs often seek concrete actions steps, asking how to “handle that particular issue differently” in future practice. Extending beyond the single situation, though, I propose that multiple clinical simulations—paired with debriefings to carefully analyze judgments and decisions—can shape teacher identity. While the simulation serves as the illuminating experience, it remains isolated and arid (Reiman & Johnson, 2003) unless it is negotiated (Wenger, 1998) through a PST’s analysis of and deliberation on the simulation data. To illustrate, I offer three examples of identity development through simulated action and reflection.

First, a cohort of SU PSTs engaged in a simulation with the standardized father, Donald Bolden (Dotger & Smith, 2009). Each “Mr. Bolden” was trained as a worried, single dad who provides detailed data on his daughter’s changes in social behavior, peer interactions, and general disposition. In providing these data, he describes his daughter as a student in crisis. Simulation video data yielded several distinct trends. PSTs questioned and self-critiqued their own knowledge bases: “I don’t feel I’m ready to have such a serious conversation about some serious issues . . . this was a totally nonacademic issue, so I need more experience dealing with (these issues) and knowing the right places to point parents” (Dotger & Smith, 2009, p. 170). PSTs cited a reliance on “other professionals,” while simultaneously indicating they were unsure of exactly which professional they should rely on. Finally, PSTs repeatedly asked about boundaries, or “where’s the line?” (Dotger & Smith, 2009, p. 172) between home and school, between student and teacher. In support of a struggling student, PSTs wrestled

with if, how, and to what degree they should intervene and extend themselves beyond the role of content specialist.

Shulman (2005a) suggests pedagogies of formation develop professional identity by eliciting one's professional judgment in uncertain environments (Shulman, 1998). Exploring the movement from knowledge to application, Shulman notes the very necessary role of one's judgment:

Human judgment creates bridges between the universal terms of theory and the gritty particularities of situated practice. And human judgment always incorporates both technical and moral elements, negotiating between the general and the specific, as well as between the ideal and the feasible. (1998, p. 519)

Consider both the "technical and moral elements" that PSTs must negotiate while engaging with Mr. Bolden. In future similar situations, reported data from a concerned parent like Mr. Bolden require a technical response. Effective professional judgment, though, drives the pace and path of the technical response. Responding teachers employing effective judgment will immediately engage with the school's formal student-support services, connect the parent and student of concern to those support personnel, and maintain communication with that parent into the future.

A second example of identity formation through simulation—and reflection—emerges when MU candidates encounter the standardized "Jim Smithers," who expresses reservations about a supplemental reading from a school-approved reading list. By design, the upset Mr. Smithers challenges each PST in three ways—asking for an alternative reading for his daughter, demanding the school-approved reading be removed from the classroom altogether, and questioning the PST on the morality of introducing "such a reading in the first place." In debrief, MU PSTs identified their struggles. One noted, "Just having the answers to what is allowed to be done . . . if alternative assignments are acceptable, and if not, what to do." This PST's words suggest a mediating approach, where she is seeking to understand what decisions are and are not within her purview as the teacher. Another PST offered a different perspective during the debriefing: "Some (peers) proposed an alternative assignment, but are we really there to please the parents? Do we let them get their way every time there are differing opinions? I don't think so." This PST's response suggests oppositional reasoning, with undertones of win/lose, my way/your way approaches to parents and families. This same simulation surfaced two different emerging teacher identities—one moderate and one entrenched. Here, we see a link between Shulman's (1998) description of human judgment and Hargreaves's (2000, 2001) emotional geographies framework. Hargreaves's *moral geography* focuses on the degree to which parents and teachers agree or disagree on "what is best" for the student in question (Hargreaves, 2000, 2001). Opportunities to hone professional judgment allow for moderation in situations similar to Mr. Smithers, where PSTs

understand the technical, procedural response to the parent; if asked, you should provide the alternative assignment. In addition, the moral element of human judgment is activated, as PSTs gain experience crafting in-the-moment decisions, where they must balance what is *right* for the student in question, her peers, and the rights of all to access curricula.

As a final example of teacher identity development, consider a simulation between SU candidates and the standardized paraprofessional, "Elizabeth Meyers" (Dotger & Ashby, 2010). At the time of implementation, these PSTs were close to graduating from their Elementary and Special Education dual certification program, which places strong emphasis on the principle of inclusive teaching environments. In simulation, PSTs were situated in front of a standardized paraprofessional to discuss how they would work together when the school year soon began. Citing her support of students with special needs, the paraprofessional suggests only once to "pull out my kids for help," indicating she did not want them to be embarrassed in front of other students.

Here was the opportunity for PSTs to counter by discussing more inclusive environments that support all students. Some did exactly this, while others offered conditions in which pulling students out of the classroom would be acceptable. Later in debrief, one PST reflected quite pointedly,

Sometimes I feel like we write what someone else wants us to write. Like I could tell you the best inclusive answers that are out there, but that's not necessarily my opinion, you know. In this (simulation), you have to be a little bit more "what do I expect in my own classroom." (Dotger & Ashby, 2010, p. 125)

This PST's words suggest a professional identity that has been tucked away because she recognizes it runs contrary to the philosophy of the faculty and her program of study. Shulman's description of human judgment emerges here, particularly as simulations help this PST translate broader theory to specific practice. In simulation, she exercises this judgment, and her identity of practice emerges.

Disposition development through simulations. The broad development of one's professional identity is supported through the growth of more specific dispositions—professional reasoning, morality, emotion, and interpersonal engagement (Shulman, 2005a). Shulman (2005a) recognizes theological seminaries and schools of divinity as preparatory contexts that utilize pedagogies of *formation*, building one's professional character and dispositions through participation in the actions and discourses of the ministry.

As a pedagogy of formation, I propose that multiple clinical simulations hold potential to help teachers develop professional dispositions. I rely on Johnson and Reiman's (2007) definition of dispositions as "trends in judgment and action within ill-structured contexts" (p. 677). In many current preparation structures, teacher educators possess few methods and opportunities to systematically observe PSTs' professional

dispositions. In a simulation, though, teacher educators can examine moments of PST action or judgment. These moments do not exemplify the “trends” that Johnson and Reiman attribute to dispositions. However, across multiple simulations, this lens widens and gives teacher educators a richer perspective on how PSTs’ moments of practice build and form into dispositional trends. To illustrate, consider data from three PSTs in a single simulation. In his dissertation, Cil (2014) situated secondary PSTs ($n = 31$) in simulation with two standardized parents who expressed differing academic and athletic expectations for their daughter. Of the 31 PSTs, three were situated in simulations with an interracial couple (e.g., an African American standardized mother and Caucasian standardized father). Strikingly, two of the three PSTs’ simulation videos reflect their confusion as to the relationship between the two parents, even after they introduced themselves as the parents of the student. One PST explains her confusion in the debriefing:

I grew up in the south so you don’t really see, you see interracial couples but you see them in the youth, you don’t see it at older generations. So that is what threw me off. It wasn’t the fact that it was an interracial couple; it was the fact that they were older generation interracial couple. So, I really got confused when I saw him walk in and sit down. And I was like okay, well he must be a friend or something, and then he said that he was the dad and I was like, Ohhhh . . . okay. (Cil, 2014, p. 88)

This single data point, by itself, should not be used to describe this PST as “in need of improvement.” If this PST, though, demonstrated further struggles in other simulations by continually responding to the demographic, instead of the person, then data points begin to align. As a pedagogy of formation, this simulation excavated some of the PST’s assumptions, appropriately challenging her actions and judgments (Shulman, 2005a).

Other dispositional constructs (e.g., degree of patience, communication patterns) certainly influence teachers’ interactions with colleagues, parents, and students. Again, I turn to Singer-Gabella (2012), who notes, “the intellectual hallmark of good practice is the exercise of good judgment, or knowledge invested in action. Such judgment is locally situated” (pp. 13-14). Utter futility awaits the teacher educator who tries to traditionally impress upon PSTs the importance of being patient in classrooms, or slowing down in speech and choosing language carefully. Simply encouraging a PST to “exercise good (professional) judgment” is ineffective, because as Singer-Gabella notes, there is no situation to which the PST can affix these well-intended suggestions. Thus, the PST either benignly bypasses the teacher educator’s suggestions for practice or more actively assumes she or he—as an emerging teacher—has already mastered professional patience and communication. Walker and Dotger’s (2012) study illuminates this poor assumption, as PSTs ($n = 141$) initially rated themselves highly across eight constructs

of school–family relationships, only to later demonstrate more limited ability in recognizing and evaluating those same constructs.

Shulman’s (1998) “technical” element of human judgment emerges again (p. 519). There are distinct, but not prescriptive, steps to take when working with a parent, conversing with a struggling student, or collaborating with a colleague. For example, there is a time to lead the conversation but also a time to patiently listen. In conversation, one should collect and document data, and there are routes and procedures for those data. Envisioning the aforementioned *Danson* or *Bolden* simulations, one sees the importance of patience and data collection, and the technicalities associated with judging when and how to engage with the parent to co-develop a plan of action and/or enlist the services of additional school personnel. Through this formative pedagogy, PSTs move beyond assumptions about what they can do (Walker & Dotger, 2012), and instead use simulation evidence to inform and shape their dispositions of professional reasoning and interpersonal engagement.

Professional identities and dispositional constructs will develop as PSTs progress to induction-stage teaching and beyond. Two questions remain, though: What experiences will shape this development, and will one’s identity and disposition reflect an ethos of care and justice? As a pedagogy of formation, clinical simulations lend structure to teacher identity and dispositional development by presenting PSTs with opportunities to exercise (and later evaluate) judgment within situations that typically only come about during licensed practice. The clinical structure of simulations—where the interactions are bounded and carefully recorded—illuminates trends in action and judgment, supporting PSTs and their guiding faculty as they analyze situated performance and collectively work toward principled, ethical practice.

Toward a Core Pedagogy

Shulman (1998) notes that case study methods occupy an ideal space between the broad applicability of theory and the engulfing nature of daily practice in schools. Simulations extend beyond the “case” by serving as a pedagogy of professional uncertainty. Uncertainty comes in two forms—from the visibility and accountability associated with one’s professional responsibilities *and* from the realization that one’s profession is full of situations where decisions are based on often-partial knowledge and actions are taken in real-time (Shulman, 2005a, 2005b). In simulations, PSTs are isolated within and vulnerable to the situation itself and their ability to immediately synthesize and apply knowledge to that situation. PSTs know their actions are likely to result in visible mistakes. Appropriate disequilibrium occurs, as the PST works to identify and enact professional decisions. At times, PSTs admit that internal disequilibrium results in actual perspiration. Both reactions—uncertainty about “what

moves to make” and physically working hard toward a solution—suggest that simulations help PSTs attune to the realities of teaching.

The uncertainty of engaging—of simply “getting through a simulation”—quickly fades as PSTs shift to the complex, nuanced uncertainties the profession offers. Uncertainty initiates and serves as the impetus for active engagement. As a pedagogy of limited, bounded engagements, clinical simulations offer the situated nature—but guard against the consuming reality—of daily classroom practice (Putnam & Borko, 2000). This pedagogy situates PSTs within challenges that are prevalent, as well as contexts that are less frequent but still fundamental to classroom practice and school service. Through engagement, the PST is held accountable, initially by the parent or student sitting across the table, and later by peers who partner in deconstructing practice.

Engagement over time leads to the formation of identity and disposition. As a pedagogy of formation, simulations juxtapose a PST’s self-perceptions of identity, disposition, and ability against the demands of practice, shifting the focus from who the PST believes herself to be to the professional she actually becomes in practice. Formatively developing these constructs in a clinical environment helps PSTs examine data on the professional self, the boundaries of the profession, and the dispositions needed to test both.

Like ER nurses, licensed teachers hold responsibility to those who show up at the door, and their actions and decisions hold equally sobering ramifications for the public. To support PSTs as they learn to take action, make decisions, and analyze consequences, teacher educators need to reduce the complexity of complex practice (Grossman & McDonald, 2008) and guide PSTs through the disequilibrating transition from preparation to induction (Korthagen & Kessels, 1999). In utilizing the core pedagogy of clinical simulations, teacher educators can activate PSTs’ uncertainties, reassure but increasingly challenge cohorts through shared practice, and formulate the ethos and judgment of the broader profession. This core pedagogy is discrete and limited, it offers opportunity for both individual decision-making and shared analysis, and it situates the learner directly in the limelight with expectation to engage. Ultimately, clinical simulations guide the PST toward “think(ing) like, act(ing) like, and be(ing) like an educator” (Shulman, 2005a, n.p.).

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Notes

1. Dotger (2013) further describes the simulation design processes and considerations.
2. See (Dotger, 2013) for detailed information on SI recruitment, training, and compensation.
3. Other manuscripts (Dotger, 2011b, 2013) outline how implementation is supported by, but not reliant on, proximity to a medical school. These manuscripts address space and technology requirements, as well as access to rosters of standardized individuals.

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