Using Simulation to Support Novice Teachers' Classroom Management Skills: Comparing Traditional and Alternative Certification Groups

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Abstract

Drawing from research on situated cognition and the development of expertise and simulations in professional education, we designed two simulation tasks that provided novice teachers with repeated opportunities to deliberately practice managing a classroom under no-fault conditions. The simulations immersed novices in two perennial classroom management challenges: motivating students to learn and dealing with non-compliance. To understand how the simulations fit the developmental needs of teachers on different preparation paths, we piloted them with graduate students enrolled in traditional and alternative certification programs at the same university. Both group's initial definitions of classroom management emphasized teacher control of student behavior; later schema emphasized control and care. References to classroom management as teacher self-regulation appeared more often within the alternative certification group. Both groups selected controlling strategies for addressing the non-compliance simulation.

Keywords: simulation, classroom management, experiential learning

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Managing day-to-day classroom interactions is a daunting task. As Doyle (1986) noted, classrooms are complex ecologies involving multiple interacting dimensions related to the social, emotional, physical, and intellectual facets of child development. To be effective, teachers must respond to these diverse facets quickly and in ways that meet individual student needs. Their work is done largely in public and in the context of an interpersonal and community history. What happened today and yesterday is carried forward into tomorrow's interactions.

Although classroom management is a core teaching practice and a top U.S. educational policy concern (Henley, 2010; Marzano & Marzano, 2003; National Research Council, 2010), most novice teachers receive little support in developing a robust understanding of classroom dynamics and they have even fewer opportunities to systematically acquire and deliberately test a range of classroom management strategies before entering the field full-time (Stough & Montague, 2014).

Three interrelated factors impede novices' ability to master classroom management. First, most educator preparation programs have persistently lacked an integrated, comprehensive curriculum on the topic (Jones, 2006). For example, among the top 50 schools of education (as ranked by U.S. News and World Report), only about half offered courses aligned with classroom management (Stough, Williams-Diehm, & Montague, 2004). Second, when classroom management is addressed, it is usually treated in general and abstract theoretical terms (Brophy, 1988). Opportunities to learn about and experiment with specific and concrete strategies under realistic conditions are rare in educator preparation programs (Grossman, Compton, Igra, Ronfeldt, Shahan, & Williamson, 2009). The third challenge is the quantity and quality of novices' fieldwork experiences. Prior to assuming their professional responsibilities, traditionally trained teachers in the U.S. receive an average of 177 hours of supervised classroom teaching experience; 75% of this time is accrued in the final student teaching semester (U.S. Department of Education, 2011), when novices' formal training is behind them. All three factors perpetuate misalignment between the ecologies of the university classroom and the world of work. Given their proportionately smaller curriculum and rare field experiences, these impediments to mastery are acute among alternative education programs (Stough & Montague, 2014).

Given these challenges, it is sad but not surprising that few novice teachers feel prepared to address their students' often wide-ranging intellectual, emotional, and behavioral characteristics (Oliver & Reschly, 2007; Roache & Lewis, 2011). It is also no surprise that they blame their educator preparation programs for failing to help them develop the knowledge, skills, and dispositions needed to succeed (Whitney, Golez, Nagel, & Nieto, 2002). Important to this work, Grossman, Hammerness, and McDonald (2009) said,

> If teaching is indeed a complex practice, and not something that individuals will naturally develop on their own, then teacher educators must develop new approaches for preparing ordinary people, in an extraordinarily brief amount of time, to be prepared for the challenge.

Many teachers are concerned with and spend a great deal of time reacting to minor student misbehavior rather than using more effective preventive approaches (Henley, 2010; Weinstein & Novodvorsky, 2011). Use of reactive management strategies has been associated with increased

teacher stress and reduced on-task student behavior (Clunies-Ross, Little, & Kienhuis, 2008). In turn, the stress of managing student behavior is a primary antecedent of teacher burnout, which detracts from workforce productivity (Chang, 2009; Friedman, 2006; Oliver & Reschly, 2007). From a social justice perspective, classroom management is of critical concern because Black and Latino(a) students are over-represented in discipline referrals and suspensions, which originate at the classroom level; this 'discipline gap' prohibits minority students' access to learning and in turn, perpetuates the achievement gap observed along ethnic and racial lines (Gregory, Skiba, & Noguera, 2010).

How can we better prepare novices for the managerial and motivational aspects of their work? We believe that designed settings like simulations or skills labs are a potentially powerful tool for transforming teachers' professional education. Drawing from research on situated cognition and the development of expertise and simulations in professional education, we designed two simulation tasks that provided novice teachers with repeated opportunities to deliberately practice managing a classroom under no-fault conditions. The simulations immersed novices in two perennial classroom management challenges: motivating students to learn and dealing with non-compliance. To understand how the simulations fit the developmental needs of teachers on different preparation paths, we piloted them with graduate students enrolled in traditional and alternative certification programs at the same university. Our exploratory work is intended to demonstrate the promises and process of incorporating simulations into the educator preparation curriculum and to inform theories of learning by doing. In particular, we focus on simulations as a window into novices' development of strategies for managing the social and emotional aspects of teaching; 'soft skills' are among the most difficult to teach and assess in professional education (Casner-Lotto & Barrington, 2006; Silva, 2009).

Simulations in Professional Education

While the purpose of professional education is to prepare novices with the knowledge, skills, and dispositions needed to deliver quality performance, the purpose of professional education research is to make that preparation as effective, efficient, and economical as possible. From this perspective immersive and experiential pedagogies are advantageous because they offer safe, customizable, and authentic spaces where novices independently activate and use their knowledge. Novices move toward expertise by experiencing uncertain situations, making decisions and responding to the consequences of their choices.

As a training tool, simulations often leverage the concept of deliberate practice (Ericsson, 2006), which focuses on *how* one practices a skill rather than simply performing that skill many times. More specifically, deliberate practice involves breaking down complex skills into sub-components while targeting improved performance of skill sets and is often paired with immediate coaching and performance feedback. Similar to self-regulated learning, deliberate practice involves task analysis, goal setting, strategy choice, self-monitoring and evaluations, and adaptations (Zimmerman, 2006); however, self-directed learning focuses on mental) activities culminating in knowledge development whereas deliberate practice focuses on increasing performance capacity. Meta-analyses in medical education have shown the simulation-based education, paired with deliberate practice, is superior to traditional preparation methods of preparing professionals to make judgments under conditions of uncertainty and risk (McGaghie,

Issenberg, Cohen, Barsuk, & Wayne, 2011). Moreover, medical credentialing recognizes simulations as credible tools for assessing health care professionals' procedural skills as well as more subtle but essential aspects of performance including quality of interpersonal communication (Van Zanten, Boulet, & McKinley, 2007). These results offer guideposts for advancement in other professional domains.

The promise and process of adopting simulation as a pedagogy of apprenticeship in educator preparation are illustrated in a handful of recent work (Hughes, Nagendran, Dieker, Hynes, & Welch, 2015; Straub, Dieker, Hynes, & Hughes, 2014). In general, this research has targeted teachers' use of instructional strategies (e.g., questioning) and motivational strategies (e.g., general and specific praise).

Skills and knowledge relevant to special education have been a particular area of interest. In general, this work illustrates that even small doses of simulation (i.e., the mixed reality simulation tool TeachLivE) coupled with deliberate practice can result in large gains in professional skills. For example, Garland, Vasquez, and Pearl (2012) provided four in-service teachers with six, 15-minute simulations (with clinical coaching) in discrete trial teaching (DTT). Fidelity of DTT performance in participants' real classrooms with real students was enhanced by 50%. Similarly, McPherson, Tyler-Wood, McEnturff, and Peak (2011) used the online simulation program *sim-School* to improve participants' dispositions toward students in an inclusion setting.

While much of this work has used live action simulations, which requires the learner to employ strategies in real-time virtual and mixed-reality environments, some researchers have leveraged vicarious learning to assess and promote teachers' skill development (Piwowar, Thiel, & Ophardt, 2013; Walker & Dotger, 2012). The 'active ingredients' of this approach include observing video models, expert commentary, and reflection on the quality of varied problem-solving approaches.

In summary, teacher education is making strides in developing immersive learning environments to promote transfer of skills to real-life classroom situations (Dede, 2009). While the examples summarized here lay essential foundations for incorporating simulations into teacher education, the field is limited in its ability to explain what kinds of simulations work for whom and under what conditions. Because alternatively certified teachers—like those in our present study—are more likely to have classroom management problems than their traditionally prepared peers (Schonfeld & Feinman, 2012), we were particularly interested in examining supports for this group.

Designing the Classroom Management Simulations

Because they are abstractions of real world phenomena, simulations inherently lack ecological validity. Moreover, if not properly designed, they can lack reliability. Finally, in order to be effective, simulations must feel reasonably authentic or realistic to the user (Dieker, Rodriguez, Lignugaris, Hynes, & Hughes, 2013; Dotger, Harris, & Hansel, 2008). In this section, we describe our efforts to increase the validity and reliability of our task designs. To be clear, the management simulations we created are not intended to fully replicate a K-12 classroom system

nor are they intended to replace novices' initial field experiences. Rather, they are intended to *supplement* novices' field and university classroom experiences by replicating the essence of a real-world situation under controlled conditions. In this study we used a mixed-reality simulation technology that allowed our participants who were physically present in a university classroom to have a real-time exchange with a small group of five student avatars who are embedded in a virtual classroom (for technical details on the simulation technology, see Hughes et al., 2015).

Establishing Content Validity

Essentially, management involves establishing order—asserting teacher control and expectations for student behavior—while also supporting students' intellectual and social development (Evertson & Weinstein, 2006). The twin responsibilities of establishing order and meeting needs reflect two major theoretical perspectives on human motivation, Behaviorism and Humanism. Starting with Kleinfeld's (1975) concept of effective teachers as 'warm demanders,' research over the past 40 years has shown that, like effective parents, good teachers use both control and nurturance to achieve their learning and socialization goals for students (Walker, 2008; Wentzel, 2002). Borrowing from parenting style research, an optimal balance of control and care can be characterized as an authoritative teaching style (Walker, 2009).

Across grade levels and ethnic and cultural groups, both control and care are associated with student engagement and learning, albeit in different ways (Nie & Lau, 2009; O'Connor & McCartney, 2007; Roorda, Koomen, Spilt, & Oort, 2011; Woolley, Kol, & Bowen, 2009; Wubbels & Brekelmans, 2005). In general, control is regarded as necessary for protecting instructional time and ensuring efficiency of learning whereas care is regarded as essential to activating aspects of student engagement including self-regulation, interest, and social responsibility goals. The importance of teachers' skillful combination of control and care is underscored by their inclusion in contemporary observational assessments of teacher effectiveness (e.g., Danielson, 2011).

To assess novice teachers' understanding and use of these foundational concepts and related management skills, we operationalized control and care as two specific and perennial management challenges: motivating students to learn (i.e., resistance to learning) and dealing with non-compliance (i.e., resistance to teacher authority). Both simulation tasks provided participants with an opportunity to apply practitioner-focused readings and classroom discussions on theories of human motivation. That is, they could choose from a range of Behaviorist and Humanist strategies to manage each form of resistance.

Another aspect of validity relates to users' perception of the authenticity of their simulation experience. As Dede (2009) noted, the subjective impression that one is participating in a comprehensive and realistic experience is important to reaping the benefits of immersive simulations, which include the ability to recognize when and how to use their knowledge. While simulations are a promising avenue for overcoming the problem of "inert knowledge" (Scardamalia & Bereiter, 1985), their success may depend on the degree to which participants have suspended disbelief. We assessed the subjective validity of the simulation tasks by asking participants to rate the simulations' realism and value.

Establishing Reliability

We standardized the simulations in three ways. First, each of the six simulations lasted three minutes. Second, each simulation presented the same challenging behavior or trigger. In the motivation challenge, for example, participants were asked to begin the simulation by introducing themselves and the content area they teach (e.g., "Hi everyone. I'm Mr. Smith. Welcome back to 7th grade algebra"). Almost immediately after this introduction, each participant encountered the resistance to learning challenge, "Why do we have to learn that stuff anyway?" Similarly, in the non-compliance simulation, participants introduced themselves and then stated at least one expectation for student behavior (e.g., "Hi everyone. I'm Mr. Smith. Remember: In this class we raise our hand and wait to be recognized before speaking"). Once a teacher expectation was verbalized, it was quickly defied. Continuing our example, if the teacher explained that she expected students to raise their hands and wait to be called on before speaking, then a student would begin to call out in class.

Third, we established a standard difficulty level. From the available five-point range, the default resistance was set at level one, which is characterized by mild misbehavior including distraction, fidgeting, and inattention at a low frequency. However, reflecting the interactive nature of simulations and the fundamental reality that effective management is something teachers do *with* and not *to* students. The manner in which the simulation unfolded was contingent on the teacher's response to each form of resistance. Essentially, we established three potential levels of performance and contingent responses to each pattern of novice behavior. In this way, the simulations are consistent with the notion of experiential learning as the joint by-product of the learner and the immediate environment (Archambault, 1964).

Specifically, for the motivation simulation, if the teacher responded poorly (e.g., only gave external reasons for learning such as a test or a vague explanation such as, 'because we have to') then resistance to learning would repeat or even escalate. If the teacher responded somewhat effectively (e.g., tried to 'sell' the subject matter as fun or worth learning), resistance would immediately stop but could recur later. If the teacher responded effectively (e.g., connected the subject matter to students' interests or developmental stage characteristics), then resistance would stop altogether. For the non-compliance simulation, if the teacher responded poorly (e.g., used coercion or threats to regain control or was too permissive), then non-compliance would continue or escalate. If the teacher responded somewhat effectively (e.g., gave a direct verbal desist), then the trigger behavior would immediately stop but could recur later. If the teacher responded effectively (e.g., used proximity and a firm but kind tone when reminding students about the reason for the rule), then non-compliance would stop or the student would express 'buy-in' to the teacher's expectation.

Methods

Participants.
There were 26 participants. Twelve were graduate students in a traditional program in which eight were female and four male; three females were older students returning to school. Otherwise, the group was in their 20s and included one African-American female and the remainder were Caucasian. This group was in the process of completing 70 hours of fieldwork

required before student teaching. Three members of this group were employed full-time as classroom teacher aides. Four were seeking secondary certification while eight were seeking elementary certification.

The second group included 14 graduate students enrolled in an alternative certification program in which 10 were female with three African-American, three Asian-American, three Caucasian, and one Latina. Four were male with three Caucasian and one Asian-American. All were in their early to late 20's. As part of the New York City Teaching Fellows program, they were seeking secondary certification. This group was in their first year of full-time employment as grade 7-12 classroom teachers in high-need public schools. The students enrolled in the alternative certification program are part of the New York City Teaching Fellows program in adolescent science education. The New York City Teaching Fellows program aims to prepare career-changers and recent graduates to teach children in high-need public schools throughout New York City.

Procedures.
During a multi-week instructional unit participants completed pre-post assessments examining their conceptions of classroom management. For the purpose of this study, students used the TeachLivE avatar technology, which is a mixed-reality teaching environment supporting teacher practice in classroom management, pedagogy and content. Between these assessments they engaged in three mixed-reality simulations that involved performing two discrete classroom management tasks. The first simulation served as baseline assessment of participants' skills and as an orientation to the technology. The two subsequent sessions offered opportunities for participants to select and deliberately practice using Behaviorist and Humanist management strategies. After each simulation participants viewed a video recording of their performance, rated their effectiveness, and responded to a set of self-evaluation prompts. Course instructors emailed each participant qualitative comments about their performance after each simulation. Participants directly engaged with the simulations for a total of 20 minutes.

Measures.
Classroom management schema. From a constructivist perspective, prior knowledge filters what we see, infer, assume, and recognize. Our knowledge changes through several mechanisms including remembering, taking problem-solving action, and generalizing or transferring knowledge to new situations. Simulation is a valuable pedagogy because it connects knowledge to action. We elicited participants' classroom management schema with the prompt, "Finish this statement: 'Classroom management is…..'; Bullet point the top 10 or so ideas that come to your mind." Participants responded to this prompt again at the end of the unit and then wrote a short reflection identifying similarities and differences in their pre-post responses. They were also asked to indicate what, if anything, the comparison revealed about their understanding of classroom management before and after the simulations.

Simulation strategies. After the initial simulation, participants reviewed the course materials (e.g., readings, case studies and video demonstrations of practice) with an eye toward identifying at least three specific strategies they would use to meet each management challenge (a minimum total of six strategies was required). To foster understanding of the goals and consequences associated with a range of strategies, participants were asked to name each strategy and then

provide a rationale for why it would be effective in addressing each specific simulation challenge.

Self-evaluations of simulation performance. To foster self-awareness and reflection, after each simulation participants watched a video of their performance and rated their effectiveness on each management challenge. They used a four-point scale consistent with the Danielson (2011) framework for teaching (4 = highly effective, 3 = effective, 2 = developing skills, 1 = ineffective).

Perceptions of the simulation experience. As a measure of subjective validity, after writing their reflections, participants rated the following statements, "The simulation was realistic;" "The simulation supported my learning;" and "I would like to try the lab again" on a 5-point scale (1 = strongly disagree; 5 = strongly agree).

Analyses and Results

Classroom Management Definitions.
Participants' definitions were coded separately by the two authors for the presence and absence of three conceptual categories: (1) *control* (defined as teacher-directed strategies to regulate student behavior), (2) *care* (defined as student-centered strategies such as efforts to meet students' needs for autonomy and relatedness), and (3) *self-regulation* (defined as teachers' efforts to manage their own behavior or emotions). The categories of control and care represent the two theoretical camps of Behaviorism and Humanism. The self-regulation category represents antecedents of teachers' management choices and actions (Martin et al., in press). A fourth category, *other*, captured data that did not fit into the three categories. Individual instances of each code were summed for each time point by group. Average inter-rater reliability was .74 (range from .65 to 1.00). This scheme accounted for 100% of the data.

The proportions of these four conceptual categories in each group's definitions by time are summarized in Table 1. Together, control and care accounted for most of the data across time and groups (range from 64% to 85%). Control was the most prevalent category in participants' initial definitions (e.g., "making expectations clear," "control of students," and "having authority"); this was particularly true for alternative certification teachers in which control represented nearly half of the data (range from 24% to 47%). *Care* tended to be the second most common category (e.g., "good teacher-student relationships," "making learning fun and comfortable," and "responsiveness"; range from 19% to 38%). *Other* was the third category in rank order (range from 11% to 27%). Concepts in this category included references to the nature of classroom management (e.g., "different for every teacher and group of students" and "the ultimate multi-tasking exercise") and statements too vague to be coded (e.g., "necessary"). Classroom management as *self-regulation* made a modest appearance in alternative certification teachers' responses (e.g., "the part that requires the most thought in advance," "choosing my battles," and "choosing what strategy works best for you"); such comments rarely appeared in traditional certification teachers' conceptions.

In terms of between group differences, traditional certification teachers made fewer initial references to control. Wilcoxon sign-rank tests identified pre-post differences. Post-unit,

references to control decreased and references to care increased; however, these differences were greater for alternative certification teachers.

Table 1
Distribution of Categories in Pre-Post Definitions of Classroom Management by Group

	Traditional (*n* = 12)						Alternative (*n* = 14)					
	Pre		Post				Pre		Post			
	f	%	*f*	%	*z*	*d*	*f*	%	*f*	%	*z*	*d*
Control	45	38	55	47	.51	.14	61	45	41	34	1.90[+]	.49
Care	40	33	45	38	1.86[+]	.49	26	19	46	35	2.11*	.54
Self-Regulation	5	4	3	3	1.41	.16	12	9	17	13	1.13	.29
Other	30	25	13	11	1.85[+]	.49	36	27	30	23	.42	.10
Total	120		116		.54	.14	135		131		.72	.18

Note. *$p < .05$, [+] approached significance $p < .06$

Participants' reflections on their initial and later definitions offer insights into the frequency data. First, consistent with the increase in care, members of both groups noted that their post-unit ideas were more positive and student-centered. For example, an alternative certification teacher wrote, "The more I struggle with classroom management, the stronger I feel about taking the time to know about students personally. I think if I knew about my students' interests and lives, I would have been a better teacher." Reflecting on her shift in emphasis from control to care, another alternative certification teacher observed,

> I am now more focused on differences between students. I am more empathetic and realize different students need to be given different things in order for them to be motivated. Only when the students are motivated will there be the best classroom management possible.

Reflections related to the theme of self-regulation indicated alternative certification teachers' contextualized knowledge and day-to-day professional role and experiences. For example, post-unit, members of this group conceived of classroom management as an aspect of teaching that could be mastered with time and deliberate practice (e.g., "I now think of it as a process as opposed to an innate ability" and "as a doable process, even for first-year teachers"). At the same time, members of this group expressed frustration at their lack of preparation in classroom management prior to entering the field (e.g., "I've pretty much had to learn by doing. It seems like a systematic failure of education training programs not to adequately prepare their teachers for the actual rigor of classroom teaching by teaching basic management tactics.")

Finally, participants in both groups described their post-unit thinking as more concrete and specific (i.e., included a variety of strategies that could be used to achieve specific goals). For example, a traditional certification teacher wrote,

> Before, I was thinking about classroom management globally, about what you must take into it, how to evaluate it, how you can improve it. Now, I am thinking about it in terms of specific tasks and strategies, about how to accomplish it, what it looks and feels like.

Simulation Strategies.
The strategies participants selected for managing the simulation challenges were coded for the same four categories used to frame their classroom management schema: *control* (e.g., "Behaviorist's use of positive reinforcement"), *care* (e.g., "make the content personally relevant to students"), *self-regulation* (e.g., "bring positive energy to the classroom") and *other* (e.g., "use my content knowledge"). Table 2 summarizes the percentage of strategies chosen for each challenge in the second and third simulations by group. Time 1 data are not included because participants entered the first simulation without preparing a written set of strategies in advance.

Both groups tended to select caring strategies for the motivation challenge and controlling strategies for the non-compliance challenge. They also made comparably modest use of self-regulation strategies (range from 13% to 23%). Differences centered on the motivation challenge. First, Kilmogorov-Smirnov tests of between group differences showed that alternative certification teachers chose twice as many controlling strategies for addressing the Time 2 motivation challenge ($z = 1.35$, $p < .05$). Wilcoxon sign-rank tests for differences by time indicated that alternative certification teachers chose significantly fewer controlling strategies for managing the final motivation simulation ($z = 2.45$, $p < .05$).

Table 2
Distribution of Strategies (Percentages) Chosen for Each Simulation by Group and Time

	Motivation Challenge				Non-Compliance Challenge			
	Traditional		Alternative		Traditional		Alternative	
	Time 2	Time 3	Time 2	Time 3	Time 2	Time 3	Time 2	Time 3
Control	16	15	30	22	55	71	47	52
Care	58	63	49	47	26	20	35	27
Self-Regulation	23	22	14	21	19	17	13	17
Other	2	0	7	10	0	2	5	4

Simulation Performance.
Participants' numeric ratings of their effectiveness were analyzed with repeated measures ANOVA for differences by time and group and for time by group interactions. Both groups reported higher ratings for both ratings over time (motivation challenge, $F[1, 25] = 9.54$, $p < .01$, partial eta square = .26; non-compliance challenge, $F[1, 25] = 38.79$, $p < .01$, partial eta square = .58). A main effect for group reflected alternative certification teachers generally higher ratings at each time point ($F[1, 25] = 8.36$, $p < .01$, partial eta square = .24). See Table 3 below.

Table 3
Self-Perceived Effectiveness for Each Simulation by Group and by Time

	Motivation				Non-Compliance			
	Traditional		Alternative		Traditional		Alternative	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Time 1	2.54	.69	2.58	.59	1.82	.55	2.38	.71
Time 2	2.48	.36	2.43	.40	2.19	.67	2.71	.49
Time 3	3.14	.73	3.00	.65	3.07	.33	2.83	.61

Review of participants' reflections after the initial set of simulations revealed two themes. First, consistent with their increased conceptual awareness of the importance of teacher care, participants in both groups set the goal of using general and specific praise more frequently in the next simulation. A second theme of presence reflected participants' new awareness of their verbal and non-verbal qualities as a classroom leader and communicator (e.g., "I could see how nervous I was…"; "I see how I can use movement more…"; and "I like my upbeat tone but I fumble my words quite a bit"). In this vein, reflections revealed that many participants used the simulations to deliberately practice and improve their classroom presence (e.g., "I realized that the slight tone of sarcasm has dropped from my voice, and my hands are flapping around less, but I now look grandfatherly with them behind my back...").

Reflections also suggested that the simulations supported participants' understanding that like instruction, management tactics must be differentiated. For example, several traditional certification teacher participants remarked that as they gained greater understanding of the individual avatar students' interests and personalities, they had more ideas about how to individualize their motivational and managerial strategies. Similarly, an alternative certification teacher wrote,

> Students can be talkative, shy, outgoing, introverted, and react differently to how you speak to them. You need to realize this right away and handle each student the right way. To one student you can say "stop" but to another student you may need to say "What do you think?"

Perceptions of the Simulation Experience.
Participants' perceptions of the simulations' realism, helpfulness, and their willingness to try it again were analyzed with repeated measures ANOVA for differences by time and group and for time by group interactions. Traditional certification teachers found the simulations more realistic and helpful than their alternative peers. Ratings of realism showed a linear effect for time ($F[1, 25] = 24.42$, $p < .01$, partial eta square = .48). Consistent with their more positive ratings, there was a main effect for group ($F[1, 25] = 15.74$, $p < .01$, partial eta square = .37), and a time by group interaction ($F[1, 25] = 19.62$, $p < .01$, partial eta square = .42). Ratings of the simulations' helpfulness showed a similar pattern. There was a linear effect for time ($F[1, 25] = 5.70$, $p < .05$, partial eta square = .17), and a main effect for group ($F[1, 25] = 19.99$, $p < .01$, partial eta square = .43). With regard to participants' willingness to try the lab again, there was a main effect for group ($F[1, 25] = 9.95$, $p < .01$, partial eta square = .27). Traditional certification teachers were more positive about continuing to use the lab than alternative certification teachers. See Table 4 below.

Table 4
Ratings of Realism, Helpfulness and Willingness to Try Again by Group and by Time

	Traditional			Alternative		
	Time 1	Time 2	Time 3	Time 1	Time 2	Time 3
	M (SD)	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*
Realism	2.59 (1.19)	4.00 (.55)	4.11 (.47)	2.58 (.88)	2.54 (.69)	2.67 (.81)
Helpfulness	4.09 (.61)	4.00 (.55)	4.67 (.39)	2.92 (1.24)	3.04 (1.19)	3.00 (1.20)
Try again	3.82 (1.16)	3.89 (.73)	4.33 (.55)	2.93 (1.20)	3.00 (1.19)	2.87 (1.15)

Discussion

This exploratory study created and tested two classroom management simulations with two groups of novice teachers. Specifically, we assessed these novice teachers' conceptions of classroom management, their problem-solving decisions (i.e., strategies selected for managing two different and perennial challenges), and their ability to use evidence-based management practices in real time. Finally, as a measure of subjective validity, we asked participants to rate the realism and value of their simulation experiences. By creating and comparing an innovative approach to learning about classroom management, this work answers calls for more research on what makes clinical preparation effective (National Council for Accreditation of Teacher Education, 2010). The methods serve as a potential roadmap to other teacher educators who wish to incorporate experiential pedagogies into their teaching and research.

In terms of their thinking about classroom management, both groups initially emphasized control of student behavior, which is a common preoccupation of new teachers (Henley, 2010; Weinstein & Novodvorsky, 2011). Their definitions four weeks later showed a more balanced perspective, articulating the importance of both teacher care and control in ways that align with an interpersonal perspective on management (Wubbels & Brekelmans, 2005) and the concept of authoritative teacher style (Walker, 2009). The two groups differed, however, in their attention to classroom management as teacher self-regulation. This theme made a modest appearance in alternative certification teachers' definitions, but it was rare in traditional certification teachers' responses. It is likely that these differences stem from the quality of the two groups' daily experiences and professional responsibilities.

Offering a window into their assumptions about *what works*, both groups tended to select controlling strategies for dealing with the non-compliance challenge and caring strategies for the motivation simulation. Typically, they countered resistance to learning with persuasion and student-centered tactics; by contrast, they countered disruptive behavior with firm control. Relative to their traditional counterpart, alternative certification teachers chose nearly twice as many controlling strategies for the second motivation simulation. Consistent with their initial focus on control and later shift toward care, they chose fewer controlling strategies for the final motivation simulation.

Both groups rated their simulation performance as somewhere between *developing* and *effective* and they perceived improvement in their practice over time. Whether they were objectively

better or not, alternative certification teachers tended to rate their performance higher on the non-compliance challenge. For many traditional certification teachers, the simulations represented their first opportunities to establish expectations and deal with those expectations being violated. Perhaps given this difference, it is not surprising that traditional certification teachers rated the simulations as more realistic and more valuable. However alternative certification teachers' reflections repeatedly showed evidence that both groups found value in watching themselves on video and were using the lab to deliberately practice their verbal and non-verbal communication skills. Future work needs to determine the distinct value-added of the simulation experience from the reflective practice of self-evaluation and video self-analysis.

Of course, findings must be interpreted in regard to several limitations including sample size and the bias of self-report. Some of the between group differences observed here may stem from developmentally related factors. For example, all of the alternative certification teachers were secondary educators; by contrast, only one-third of traditional certification teachers were planning to teach at this grade level. Further, we have no understanding of the simulations' impact on teachers' practices with real students in real classrooms. Future research must pursue the question of transfer. For example, do candidates who have the opportunity to practice management and instructional practices in the lab have a more successful entry to the field? And in turn, do novices who have simulation experience perform better on observational measures of teaching and in assessments of student learning?

Finally, we established the content validity of the simulation tasks by drawing from evidence-based practices and contemporary teacher evaluation scales. The validity and reliability of our simulation tasks and related scoring systems would be enhanced by having expert teachers complete the simulation challenges. In addition to establishing performance benchmarks, capturing experts' performance on video could foster the creation of a multimedia library that can be used as vicarious learning tools (see Piwowar et al., 2013).

While our simulations were sensitive enough to detect group differences, future work should continue to explore novices' professional development needs and tailor the simulation experiences to meet them. For example, perhaps alternative certification teachers would have found more value in the simulation tasks if they had allowed students to model problems of practice that teachers were currently experiencing in their classrooms. On a developmental continuum of expertise, both traditional and alternative certification teachers can be characterized as advanced beginners (Dreyfus & Dreyfus, 1980); however, alternative certification teachers' professional roles and responsibilities create a more urgent need to develop mastery especially at the social and interpersonal aspects of teaching. There is much more to learn about the role motivation plays in accelerating the development of expertise.

In summary, as an experiential pedagogy, simulations have several unique affordances including the ability to abstract problems of practice and to experiment with various problem-solving approaches under no-fault conditions. As a research sandbox, simulations offer a valuable means whereby to ethically teach and assess a range of social processes that advance understanding of experiential theories of learning and the complexity of learning to teach.

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