*Original Research*

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# (Inter)Active Learning Tools and Pedagogical Strategies in Educational Leadership Preparation

Journal of Research on Leadership Education
1–19

DOI: 10.1177/1942775120936299
journals.sagepub.com/home/jrl
SAGE

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**Abstract**

This article presents three types of (inter)active learning pedagogical tools to better prepare future administrators for complex, real-world tasks. We propose a framework of narrative linearity and responsiveness to examine digital cases, digital simulations, and clinical simulations as bridging pedagogies from abstract class-based methods to fully immersive internships. We illustrate how these characteristics influence learner interaction with the rich, hypothetical contexts these tools offer. A specific example is presented for each tool, and their cognitive demands on the learner are discussed. We raise implications for their use at the course and program levels.

**Keywords**

interactive, case methods, cases, simulations

An ongoing and central concern of educational leadership preparation programs (ELPPs) is how best to provide rehearsal opportunities and feedback to develop prospective school leaders' judgment, so they may apply their knowledge and skills for an effective impact in varying contexts. This transfer into practice is essential not only for prospective school leaders to demonstrate competence, as licensure standards are performative in nature, but also for ELPP faculty to leverage their investments in courses to develop professional knowledge. The challenge of transferring theory into practice is addressed in varying ways in the nearly 600 ELPPs across the United States.

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A number of practices have emerged, such as problem-based learning and critical reflection (Byrne-Jiménez et al., 2016), but programs still rely predominantly on texts, classroom-based discussions, and field experiences (Dexter et al., 2019). The prevalent read–discuss–apply approach has long been criticized not only for providing inadequate development of procedural, contextual, and experiential knowledge but also for insufficient scaffolding to apply that knowledge in practice (Darling-Hammond et al., 2010). Knowledge development requires *active* construction in context, because meaning is made through experience. Positive interactions with well-supported and challenging contexts foster meaning making and skills development over time.

This article explores how three innovative pedagogical tools could be used in ELPPs to provide *interactive* experiences with contexts. Digital cases, digital simulations, and clinical simulations are discussed in terms of how they allow learners to practice applying and integrating knowledge and skills in realistic but hypothetical scenarios that require them to construct context-sensitive responses to a dilemma. These tools also provide instructors with increased opportunities to deliver feedback to learners on their emergent procedural (how), contextual (when), and experiential (why) knowledge. Positioned carefully in an ELPP, they could also aid faculty in scaffolding candidates' readiness for internships, which is a critical and last opportunity to prepare prospective school leaders for the field.

## Conceptualizing Learning Experiences That Bridge Theory to Practice

### *Active Learning and Situated Learning Theories*

Active learning has been defined as opportunities "for students to meaningfully talk and listen, write, read, and reflect on the content, ideas, issues, and concerns of an academic subject" (Meyers & Jones, 1993, p. 6) through any number of strategies, such as small group work, papers, and presentations, or even the three types of tools discussed in this article. Michael and Modell (2003) elaborated that active learning pedagogy should not merely be active, but provide the essential impetus to build, test, and repair one's mental model of what is being learned. General discussions of active learning pedagogy in higher education are grounded in a constructivist model of learning, which emphasizes the learners' active engagement to create understanding.

Although research points to active learning approaches as elemental to more robust ELPP designs, such approaches are not consistently integrated into ELPPs. Research on ELPP features related broad characteristics such as "active learning strategies that integrate theory and practice and stimulate reflection" (Orr & Orphanos, 2011, p. 120) to graduates' increased learning in, and positive beliefs about, their ELPP. A research review of effective ELPP features identified a wide assortment of program elements including active learning pedagogies (Crow & Whiteman, 2016). However, research also suggests that such pedagogical approaches are not uniformly a component of all programs (Darling-Hammond et al., 2010). Thus, the granularity and demonstrated efficacy of findings in this literature provides limited guidance to ELPP faculty as they

design instruction, for being active does not necessarily lead to learning, let alone applying concepts to bridge theory and practice or transferring them among contexts.

Prior work by Cosner and colleagues (2015, 2018) provides two of the few existing accountings of active approaches for educational leader preparation and development. Cosner et al. (2018) examine "the use of field-based application-oriented projects . . . designed to make leader learning 'active' and 'motivate the application of learning within school settings'" (p. 239). They identify problem- and case-based learning, simulations, action research, and inquiry projects as potential means to first provide opportunity to apply learning and then later draw upon that experience for additional learning. They add to these strategies course-initiated, field-based cycle of inquiry projects (described further in Cosner et al., 2015) that "straddle the large-group learning setting and an authentic work setting as learners take up one or more facets of inquiry-motivated work in their actual schools" (Cosner et al., 2018, p. 241). Consistent with situated learning theory (Lave & Wenger, 1991), Cosner et al. (2018) found leadership students drew upon contextual resources that in turn shaped their learning. In this examination, school-based data served as material learning resources, and individuals and school-based teams served as social learning resources providing a basis for the kinds of authentic leadership considerations and experiences that are constitutive of leadership practices students targeted for development. Thus, they illustrate how context becomes an important learning resource in this active learning design.

This same association between active learning and authentic contexts is implied by scholars who identify active learning as one of the five key elements of teacher professional development (Desimone et al., 2002; Desimone & Garet, 2015). Desimone and colleagues define active learning as "opportunities for teachers to become actively engaged in the meaningful analysis of teaching and learning" (Desimone et al., 2002, p. 83), which, again consistent with situated learning theory (Lave & Wenger, 1991), implies that teachers own professional contexts are resources that shape their learning. They identified four dimensions of active learning: observation, planning, learner feedback, and presentation. The most valuable component of observation is feedback—delivering feedback on observed practice and receiving feedback on one's own practice. Active learning in this sense is based on the "meaningful analysis of teaching and learning" (Desimone et al., 2002, p. 83). For planning, or the application of learned theory, to be a learning opportunity, there should be a review element, in which the learner receives feedback from instructors and/or colleagues. In the case of leadership preparation, learners need feedback from those they will be leading. In an instructional setting, this feedback can be shared collectively and reflected upon. Finally, presenting, leading, and writing are not only ways of demonstrating or disseminating knowledge but also opportunities for questioning, discussing, and responding. In these ways, each of the four dimensions of Desimone and colleagues' notion of active learning is reliant upon the multidirectional flow of information. This reciprocity arises from action and agency on the part of both instructor and learner, leader, and led.

## *Engaging Context Through Linearity and Responsiveness*

These educator scholars suggest that the context of authentic settings is a necessary component in any active learning intended to bridge theory to practice. Yet, context is described by Hallinger (2018) as in the "shadows" of leadership studies, as evidence-based practices and leadership standards and competencies are stated in "average" ways. He identifies how institutional, community, national, cultural, economic, political, and school improvement contexts might influence generic conceptions of practice, and advocates that ELPPs must not teach just teach leadership as *what* to do but also develop judgment of *how, when*, and *why* to do.

Cases and simulations can serve as imagined contexts for practice onto which students can project what they are learning in courses. Rich, complex contexts allow instructors to guide experiential learning, but in a fail-safe way, and to contrive critical or even rare emergency situations. In many instances, including instruction, discipline, family engagement, and public relations, hypothetical contexts are safer spaces for prospective leaders to rehearse without the potential for negative outcomes for students (e.g., microaggressions, lost learning opportunities, equity violations, public embarrassment). Feedback about hypothetical contexts can be authentic and constructive, in addition to being research based, without being traumatizing. Furthermore, because rich contexts require more integration of knowledge, they are more likely to support learners' transferring understanding to the real world—to aid theory to practice connections.

Although these three learning tools have distinctive formats, there is a broader set of characteristics by which they can be grouped that highlights nuances in how learners interact with context-rich scenarios: first, whether or not they have a fixed, linear narrative for the information they contain; second, whether or not they are responsive, meaning that what appears to the learner depends upon choices the learner makes, as opposed to being static. This pair of characteristics affect how the learner engages the context portrayed in the scenarios, and therefore can inform instructional design.

*Linear* designs make use of narrative structure to influence decision making, whereas *nonlinear* designs construct a narrative from decisions made by the learner. *Linear static* designs are exemplified by traditional text-based cases (such as those in the *Journal of Cases in Educational Leadership*), where information is presented in a sequence that serves the purposes of the theoretical frameworks or principles the case is intended to teach. The narrative structure and sequence set up the type of decisions called for from the learner.

In a *nonlinear static* design (i.e., digital cases), which may be a raw data set or multiple data sets with context, information is either (a) not structured or (b) not sequenced. Thus, either the learner applies structure to the data as part of the problem identification process or the structure is determined by the learner's decisions as the case proceeds, similar to responsive nonlinear cases. In a *nonlinear static* design, the practice of connecting discrete data points from a common context to tell a story constructs the problem and thus demands that the learner find coherence within the data and impose a structure from their own schema. The strength of nonlinear static designs is that they provide a realistic context and varying decision points. Nonlinear designs

can offer the most opportunities to learn whether learners go through the design more than once, considering the effects of different decisions. Thus, nonlinear designs may require more time to complete and often require more time to grade and provide feedback on to help learners learn from errors and consider decisions made using multiple acceptable paths.

In a *nonlinear responsive* design (i.e., digital or clinical simulations), the learner applies learned principles, theories, and frameworks to a hypothetical situation, and then consequences occur. These consequences were built into the case based on the social, organizational, or psychological frameworks of those theories. *Nonlinear responsive* materials offer new possibilities for feedback and more realistic consequences within the simulation. When learners make better or worse choices as the scenario progresses, the materials and the choices they see next signal to them whether their approach produced the intended effect or not. Digital simulations may also capture and present back to the learner their path and selected options through the scenario, and such information can be useful to prompt reflection or to inform instructors about students' reasoning. Because they provide a fail-safe environment, learners can try out a number of approaches without real consequences. However, for such option exploration and embedded feedback to be effective, the inherent logic of the *nonlinear responsive* designs must be aligned to the instruction and the performative nature of the standards. Because the paths through simulations are determined by their authors, the characterization of choices as better or worse could possibly be at odds with instructors' opinions, the theory base under study, or fail to prompt action in ways similar to what is called for in the standards. Such examples need not be negative but may provide unique learning opportunities or opportunities for discussion or debate.

## Summary

This literature suggests critical points for considering digital cases, digital simulations, and clinical simulations as suitable active learning pedagogy in ELPPs. First, learning experiences with them require further schema development in ways that attend to context. Second, they provide rich rehearsal opportunities to carry out leader practices. Third, they require cognitive activities in contexts that can approximate the daily challenges leaders face. Such learning experiences can then also be analyzed for how they ready prospective leaders for mastery learning in clinical experiences.

Specifically considering teaching with digital cases, digital simulations, and clinical simulations, we propose the phrase *(inter)active learning pedagogy*. This not only captures the necessity of give-and-take among learners and faculty in effective active learning but also how the characteristics of these three tools situate learning in context-rich scenarios and foster such pedagogy. It also distinguishes these tools from active learning pedagogy discussed elsewhere in this issue as situated in learners' actual workplaces. The virtual nature of the context-rich scenario within these three tools provides affordances to (inter)active learning pedagogy that complement what is uniquely available to active learning pedagogies that rely upon actual professional contexts.

## Tools for (Inter)Active Learning

Next, we describe how each of these three tool's characteristics help us understand *how* it may promote learning, and what that suggests about *when* this tool is best used for learning goals. We searched the digital education databases ERIC, Academic Search Complete, Education Full Text, Education Research Complete, and Psychology and Behavioral Sciences Collection to find examples of tools from the last 20 years that intersected with the field of educational leadership. The reference sections of all retrieved studies and authors' previous experience and expertise with the tools, including archival resources, provided additional examples. Examples within types were considered together and analyzed with the conceptual framework for their salient features and the implications for teaching and learning. We provide as examples of each tool those concerned with educational leadership that are still available for use.

### *Digital Cases*

Digital cases are distinguished by their digital delivery format and features that require the learner to make choices, which are often captured by the software and represented back to learners or instructors. They provide a rich context that presents to the learner some kind of problem to solve, or decision they must make by bringing their knowledge and experience to bear. But they introduce added complexity in that the narrative is nonlinear and is instead presented as clickable choices in a menu-driven interface. They are not considered responsive and interactive because the choices the learner makes do not direct the scenario that unfolds or change the information then made available to the learner. The extensive contextual information these types of cases provide is intended to create a more realistic and complex situation for the core dilemma. This expands the learners' focus from simply solving the problem, as in traditional case studies, to also identifying information to name and frame the problem, as well as craft a response.

We located four examples of digital cases in the research literature, and next describe the one which is still available for use. *Educational Theory Into Practice Software* (ETIPS) was developed at the University of Virginia (Dexter & Tucker, 2009) to provide postsecondary instructors cases for leadership students to apply course concepts in a richly described school context. They are available for free use at http://leadership.etips.info.

ETIPS is best described as a digital platform in which instructors construct case assignments requiring in-depth responses that also provides embedded assessment features for instructors to formatively assess learning as aspiring administrators practice making leadership decisions. Instructors create a case by first selecting among three areas of leadership decision making: instructional, organizational, and relational. They next select among three to four topics that determine the case prompt. Cases can be set in one or more of nine hypothetical, yet realistic, K–12 school settings, including elementary, middle, and high school settings at low-, middle-, and high-performance levels. The ETIPS cases incorporate text and graphics in a hypertext menu portrayed as a school and intranet site and requires learners to choose what information to review.

They begin with a scenario posing a dilemma. Student responses are structured by a four-step decision-making process—identifying the issue, determining guiding principles, suggesting alternative solutions, and selecting the best alternative and creating an action plan (see Figure 1).

The ETIPS platform design provides professors with evidentiary-based reasoning about their students' key knowledge under consideration in the case by leveraging technology in support of the collection and analysis of that evidence. This includes an automated essay scorer for students to use before they submit case responses and *PlanMap*, a visual representation of the menu items where students predicted they should seek relevant case information, where they actually went, and what menu items the case authors identified as essential. *Snapshot* is an additional feature that leverages the digital delivery format. It provides a live summary of students' answers to case questions in progress that instructors can view during or after the case assignment, and can optionally provide to students either as they proceed through or after they complete their own case response. Finally, students can take notes on any page, and they are compiled onto one place under headings that are hyperlinked back to the page on which they were taken.

Evaluation of the ETIPS leadership cases using a pre–post design in a test bed of faculty (nine faculty, and pre–post surveys and three cases completed by 118 students) showed that learners significantly improved in their problem-framing abilities (Scott et al., 2010) and the quality of their decision making (Tucker & Dexter, 2011), as determined by trained scorers reviewing their first and third case responses. In pre–post surveys, students self-reported an increase in their decision-making self-efficacy and their certainty about case responses (Tucker & Dexter, 2011).

## *Digital Simulations*

Digital simulations are similar to digital cases in their nonlinear presentation of information relevant to a problem-based scenario. As click-driven interfaces, these two tools also share the ability to capture choices as cognitive pathways and represent them back to learners and instructors. Simulations are distinguished by their responsive nature, where what the learner sees next in the simulation is dependent upon which choice they clicked on at each juncture in the problem scenario. *Each choice learners make potentially changes the narrative pathway.* This adds complexity to what the learner must do as the scenario can take unexpected developments to represent the consequences of the decisions made at each juncture. Simulations are best described as authentic models of systems or processes where learners can evaluate the impact of various courses of actions on the model.

We identified one digital simulation still available for use in the field. The ELS software simulations were developed at the University of Pennsylvania as a professional learning experience for K–12 in-service school leaders and ELPPs. Practicing school leaders in a midcareer doctoral program drew upon events they experienced to develop the original group of simulations as course assignments. These simulations are currently available to license for use at https://www.edleadershipsims.com/.

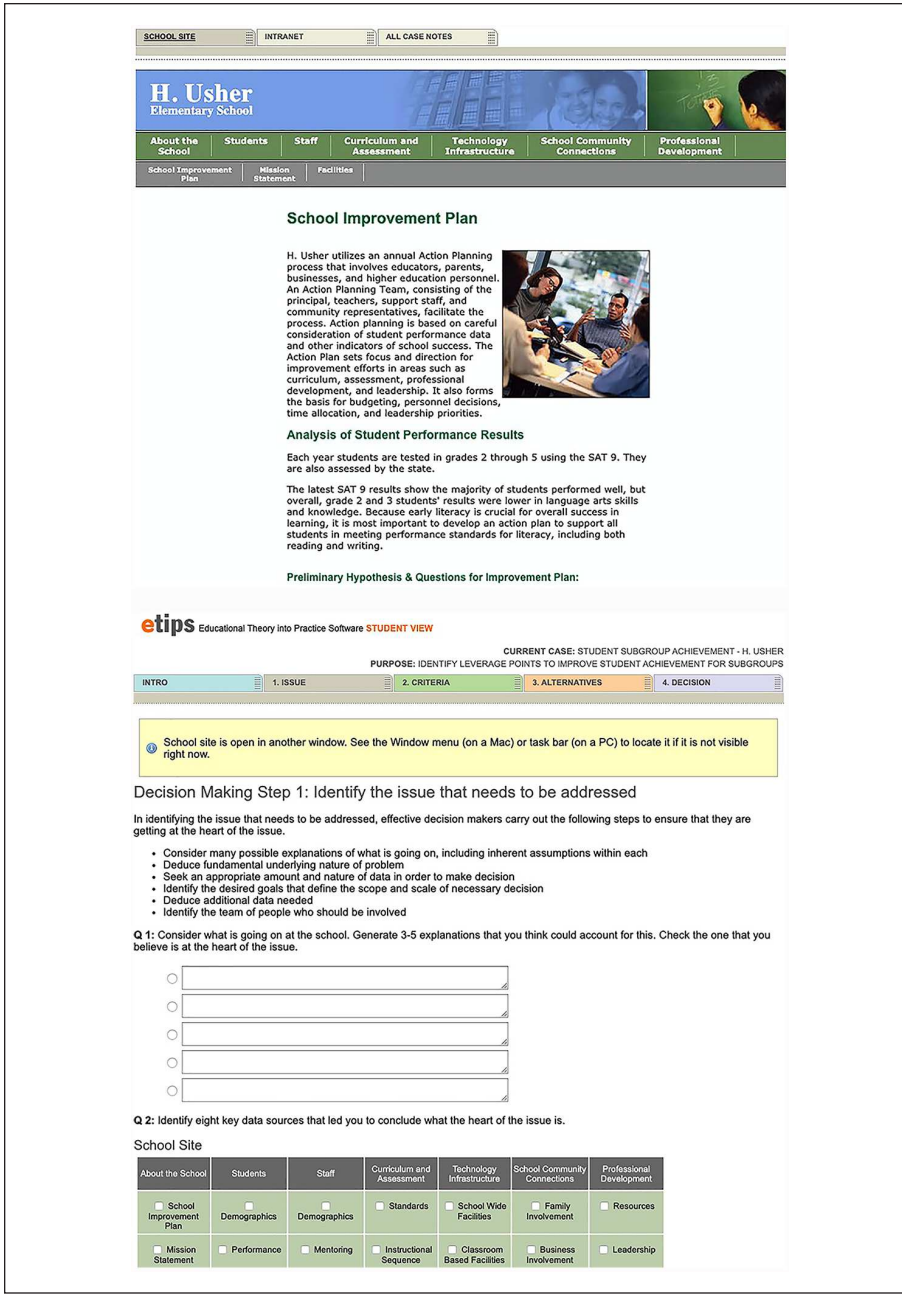


**Figure 1.** Case information and student answer interfaces in ETIPS leadership cases.
*Note.* The top portion of the figure displays one possible school context, with tabs for the case information (website and intranet), and the learner's notes. The bottom portion of the figure displays the tabbed window for the four-step decision-making process learners complete.

ELS software simulations use audio and video of actors to present the scenario. This is usually accompanied by similar on-screen text and sometimes reference materials to add further detail to the context. The interface allows students to advance the simulation as new stakeholders present additional information and interactions to further contextualize the problem. Like a complex "choose your own adventure" story, at certain junctions in the simulation, multiple choice answers are used to present actions the learner may take. Based upon which choice is made, the next information presented is a consequence of that decision (see Figure 2).

The ELS simulations vary in how they present feedback to learners. At the minimum, the various combinations of the learners' choices will bring the narrative to a number of planned end points, some of which may be portrayed as successful. Others are portrayed as less successful conclusions and the simulation may prompt the learner to start over and try again. Some ELS simulations present on-screen indicators of performance during the sim. For example, in a teacher evaluation simulation, the learners see a gauge representing the teacher's stress level as a feedback on their actions taken. Others provide summary information or performance ratings.

DeJong and Grundmeyer (2018) implemented this tool in individual and group settings at two different universities and surveyed their students regarding their perceptions of its usefulness. Participants reported the class discussions were highly engaging and stimulated critical thinking, and that the simulations helped them to realize different perspectives and increased their self-confidence to lead. They also perceived the simulations as helping them to meet course objectives.

### *Clinical Simulations*

Clinical simulations are live in-person simulations. Over the last 60 years in medical education, this model of education has developed as "standardized patients." Over the last 20 years, it has been adapted for use in teacher and leader education (Dotger, 2011). They are more planned than role-plays in that the learner interacts with a trained actor whose role in the planned scenario is specifically written to elicit the learners' use of knowledge and skills with appropriate judgment, timing, and sensitivity to context. Similar to digital cases and simulations there is a nonlinear narrative and interactivity, but because it is humans who provide those characteristics, they arguably offer the most realistic and complex opportunities to practice. Because they are not digital, clinical simulations do not inherently capture the learners' decision choices and pathways, but the performance can be taped to allow later review.

We located one example of clinical simulations in leadership preparation. At Syracuse University, Dotger (2011) developed 15 simulations in the *School Leader Communication Model* to represent a variety of interactions school leaders might encounter with parents, students, and faculty/staff. The case materials and instructions to implement these 15 simulations are available in a book (Dotger, 2014).

These clinical simulations begin with a problem-of-practice briefing to prepare the learner to take on the role of the administrator in the simulation. The amount of information provided in the brief varies, depending on the simulation. A leader-initiated

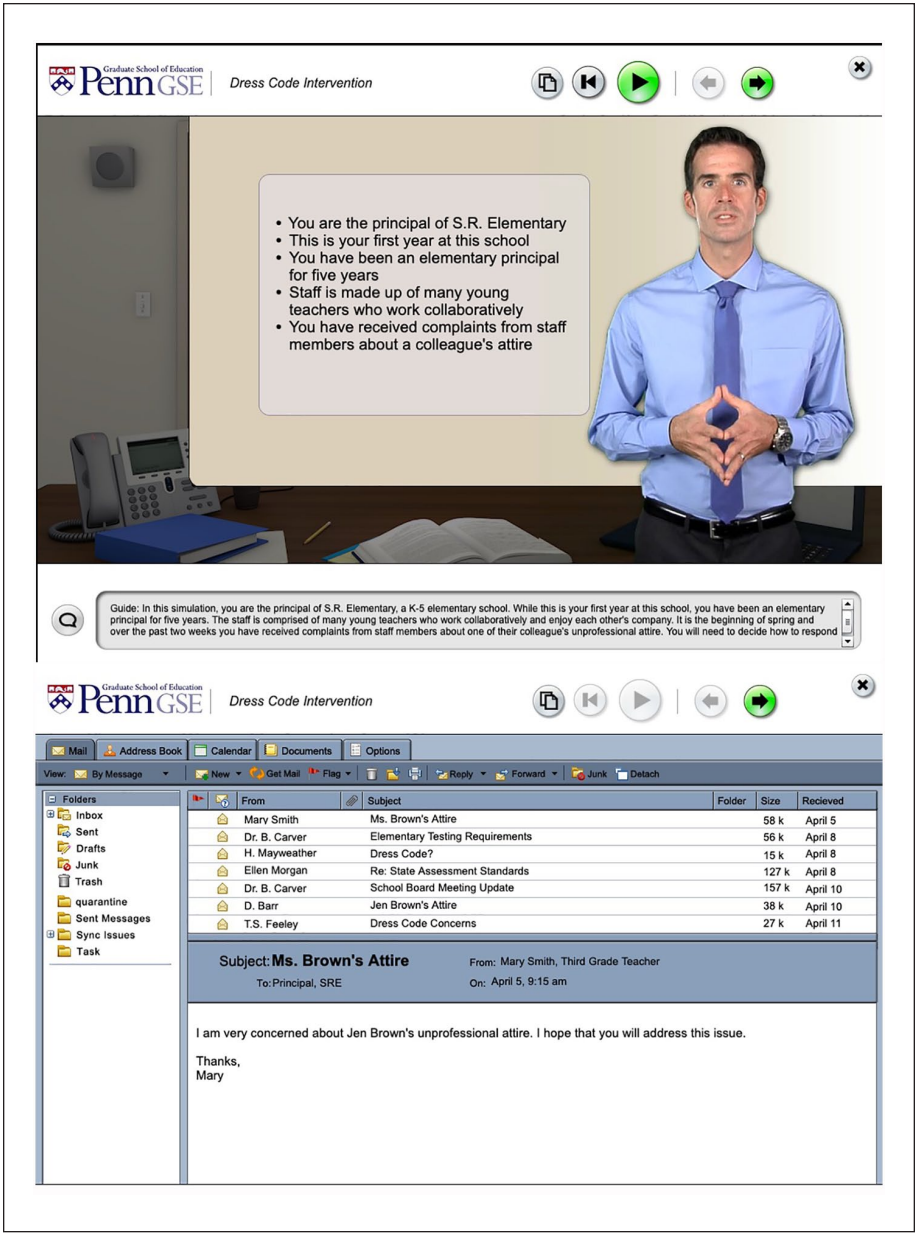


**Figure 2.** *(continued)*

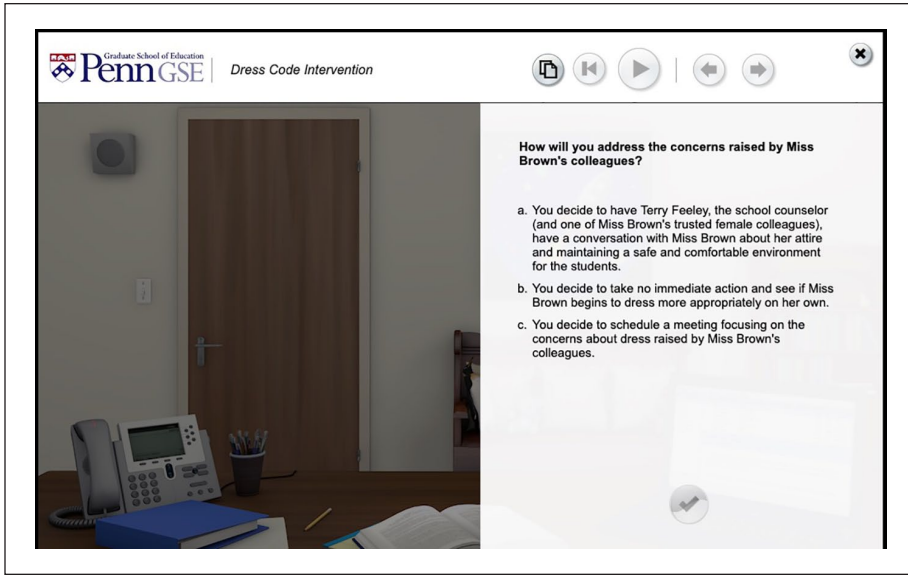


**Figure 2.** One of several interfaces used in the ELS software simulation "dress code."
*Note*. The top portion of the figure displays one of the case introduction video, with buttons to advance the sim, and access relevant resources. The middle portion of the figure displays the series of emails the learner sees that advance the narrative. The bottom portion displays the three choices from which the learner must chose to advance the narrative.

conference, for example, will include all the necessary data and background information on the student or parent involved. Parent-initiated simulations may provide very little, if any, background information to ensure the authenticity of the interaction. The problem of practice may involve decision making about events ranging from more typical day-to-day, to rare events in a principal's job. Depending upon the scenario, learners may be presented with unexpected interruptions such as a phone call, visitor, or emergency requiring them to adapt and pivot their planned course of action. These clinical simulations always require the learners to read the situation and actively engage in dialog with the actors in front of them. The actors react to each learner's responses but standardize the experience according to how their script defines the problem space and bounds the context of the scenario.

At Syracuse University, Dotger and colleagues used the recording capabilities built into the specially designed practice rooms in a nearby medical school to unobtrusively record students' performances. The recordings are then available for review by instructors for feedback purposes and to allow students to reflect on their words, actions, and consequences.

In a principal internship course, Dotger and Alger (2012) utilized clinical simulations with seven prospective school leaders to help them develop in their handling of parental involvement around school curriculum matters and other reality-based problems of practice. They found that these students responded to parental concerns in a variety of ways. Some relied on school and district policies, whereas others emphasized a school's social responsibility. By reviewing recordings of the interactions, students were able to reflect back on their choices and the words they used to convey those choices. As students reflected on their approaches, they recognized how including their own opinions when responding to parents only made the interaction more complex and potentially generated future issues. In their conclusion, the authors suggested, "that carefully-crafted, live, one-to-one simulations hold potential in helping novice school leaders . . . practice transferring what they know about . . . leading into what they can do, moving deliberately from preparations to practice" (Dotger & Alger, 2012, p. 358).

## Discussion

Viewed through the lenses of constructivist and situated learning theories, experiences in virtual contexts can provide the landscape and knowledge-construction opportunities learners require to practice leadership and develop the skills to do the job of a school administrator. The three tools examined here all promote (inter)active learning pedagogy requiring learners' interpretation of, engagement with, and manipulation of virtual material and social resources in a specific context. Students' thinking can be structured by interacting with this context. In all three, the context is set by the tool's authors, with an additional layer made possible by the instructor. To this end, we discuss the implications of each for instructors from both an instructional and an implementation perspective.

### *Implications for Instruction*

In light of the varying linearity and responsiveness of the three tools we identified, leadership preparation faculty must contend with differentiated implications presented by these tools. Below we discuss considerations presented by each tool for instruction and assessment.

*Digital cases.* The nonlinear structure of digital cases is more realistic in nature than a traditional narrative case, as a school and community present many sources of information that vary in relevance and ease of interpretation. Without a predetermined narrative, learners must construct the problem from the available facts, drawing upon prior knowledge to select what is and is not pertinent information. This requires more developed schema to guide exploration, because this is not inherent in the case itself. This has the potential to overwhelm the learner, take them off track, or encourage muddling through, but such outcomes are also more authentic leadership experiences, which support transfer to real-life situations with similar dilemmas. A key role for the instructor

is framing the case to a developmentally appropriate degree in terms of course content and standards, current issues in schools, and criteria of a quality response.

Some prior success in applying key declarative knowledge will support these more complex steps of navigating and selecting information in a disciplined way, which can serve to draw out students developing procedural, contextual, and experiential knowledge. This means digital cases must be scaffolded by previous experiences with less complex, more formulaic narratives, and that instructors may need to guide learners in developing or sharpening their criteria for discerning the root cause issue in the case and what information is needed to make sense of the context and recognize its influence on the available courses of action. To leverage this additional complexity as an opportunity for learners to develop contextual knowledge would likely require instructors provide specific instructions to guide the patterns learners recognize, and the conclusions they take away. Instructors should seek to do this through developing questions and directions to facilitate learners' sensemaking, as opposed to direct instruction.

The digital format of the case may afford the capture and representation of learners' choices in the case (e.g., click-through sequences), providing for formative and summative assessment of contextual knowledge. Other artifacts could represent to an instructor students' progress through digital cases so as to allow them to intervene and correct their course, or even automatically provide interventions to alert students to the relevance of their information selections. Such software might also prompt the learner to review key information they had not yet sought or present comparisons of their case responses over time. However, leveraging such artifacts as assessment data would require the instructor align them to the performative nature of standards and determine the logical tie between the learners' approach to the case information and what is called for or implied by the leadership standards in use.

*Digital simulations.* The nonlinearity and complexity of simulation narratives require a simultaneous understanding of the problem, integration of knowledge, identification of pertinent information, and anticipation of consequences. Through this problem-based decision-making exercise, theory learned through other methodologies can be applied in practice. Use of digital simulations as a pedagogical approach goes beyond the traditional student–teacher interaction in which knowledge is shared and acquired. Digital simulations help learners construct knowledge by providing the context from which problems of practice arise. Accordingly, procedural, contextual, and experiential knowledge can be developed through trial and error in an interactive, digital environment where failure is acceptable, because no students or other stakeholders can be harmed.

An instructor's purpose for using a digital simulation will dictate the level of complexity and amount of schema or background knowledge students require. For example, if the purpose is to illustrate how new course content might manifest in leadership settings, not much is required in prior schema or background knowledge. As students move through their program development, instructors can increase complexity by removing scaffolds or supports and expect students to demonstrate increasing mastery. When initiating a simulation, establishing the context ensures students are more likely

to make connections to previous learning and construct new knowledge. As students interact with variables, contemplate consequences, and reflect on the results of their choices, instructors ask questions and provide feedback that nudge students into productive reflection and learning. Instructors need to learn to interpret data created by digital artifacts (e.g., selected courses of action, written rationales, communiques to staff or parents in the sim) to drive instruction and provide individualized learning support.

In most cases, learner choices within digital simulations produce artifacts that can potentially serve as formative assessments, especially when instructors align the instruction to standards. As students execute their decisions and reflect on their consequences, instructors interject to provide the individualized instruction the data suggest. Appropriate interventions may be individual journaling, peer-to-peer reflections, group discussions, or even direct instruction followed by repeating the simulation.

*Clinical simulations.* As with digital simulations, clinical simulations support situated learning through interactions with contextualized environments. Proponents advocate that the cognitive demands of clinically simulated problems are the closest approximation of challenges leaders will face in actual practice, in that they have no predetermined outcome or an opportunity to rewind or do over. Learners draw from previous learning to generate alternative courses of action and make decisions fitting the circumstances of the clinical simulation narrative. Instrumental to the effectiveness of clinical simulations, learners take the perspective of and act as if a school leader. This redefined frame of reference is necessary for developing an aspiring principal's ability to negotiate the multidimensional aspects of leadership. The act of playing a school administrator in a clinical setting could build confidence, especially after repeated practice and trial-and-error, leading to a positive influence on a student's self-efficacy and capacity to imagine themselves as an actual administrator in the real world (Bandura, 1997).

Instructors facilitate participation by identifying actors and providing the respective protocols to them and learners. These standardized individuals (SIs) must prepare for their role by learning the background information and the general beginning, middle, and end of the narrative. They also study which learner reactions are triggers that are to drive their participation in the narrative. Instructors provide learners with presimulation reflections and then observe the interactions without interrupting, providing feedback and reflection opportunities at the end as learners watch the recorded playback of their performance. Typically, postsimulation debriefing is required and asks learners to review and reflect on their performance to further refine their developing leadership competencies.

Although artifacts are not generated in clinical simulations in the same way they are created in digital simulations, video recordings or an instructor's observation of performance on the simulation itself may provide formative and summative assessment data, offering insight on a learner's knowledge, professional decision making, and reflective and ethical dispositions (Dotger, 2014). Through ensuring that content is reflection rich and the instruction is active, student-centered instructors can increase

**Table 1.** Key Cognitive-Oriented Characteristics of Context-Rich Virtual Experiences.

| Tool | Focus | Prerequisite knowledge level | Cognitive implications | Reckoning with experience |
|---|---|---|---|---|
| Digital cases | Problem framing and focusing the search for relevant information | Enough to formulate a targeted search | Construct framing, identify problem, then apply | Learner's experience |
| Digital simulations | Forced choices to apply contextual knowledge | More, to better select action options | Act, interact, react | Learner's experience<br>Author's structuring of problem space |
| Clinical simulations | Communication "as if" the leader | Most, to reason about and generate a response | Synthesize, generate | Learner's experience<br>Other participants' enacting of problem space |

the likelihood that meaning is constructed and knowledge is created. An added benefit of clinical simulations is the instructor's unique opportunity to solicit SIs' input when facilitating critical reflection and discourse postsimulation. SIs provide aspiring principals feedback from their perspective as the simulated student, teacher, or parent, thereby broadening the feedback loop from that of the instructor only.

*Summary.* As described above, with each tool the learner is drawn into a type of narrative requiring further schema development, with varying demands of cognitive loads, tasks, and prior knowledge. Behavior resulting from the application of prior knowledge to the collection of formal and informal experiences constitutes learning that can inform future practice (Hoare, 2006). Students who receive feedback that tells them *how* to improve have greater self-efficacy and better performance than students who receive evaluations identifying norm-referenced strengths and weaknesses (Chan & Lam, 2010). Table 1 expands the points raised above to highlight how the variations among tools illustrate these increasing demands and therefore better suit a tool for some purposes versus others.

## *Implications for Implementation*

Rather than presenting limitations, we offer opportunities for learning in the form of implications for research and implementation. A great caution for adoption of these three tools in ELPPs is raised by the limited research about the impact of any of these specific approaches on leaders' knowledge and skill development. The data from all three of the researched tools were collected in convenience samples that do not allow for generalizations. The digital cases used a pre–post study design to measure the quality of students'

responses and their perceptions of their decision-making self-efficacy (Tucker & Dexter, 2011). The digital simulations offer perceptual data regarding their positive impact (DeJong & Grundmeyer, 2018). A qualitative case of seven students in one internship course informs what we know about clinical simulations (Dotger & Alger, 2012). The literature is much richer regarding the rationale for such tools, their development, and their implications for instruction. There is also promising evidence regarding these tools in other fields. But the opportunity costs and potential material costs and time required for adoption necessitate further research on their efficacy for leadership preparation.

Some implications for implementation follow from the differences summarized in Table 1 about what tool is best for whom and under what conditions. Learner readiness needs to be considered in selecting the tool around which to center a learning experience intended to develop procedural, contextual, and experiential knowledge. Instructors must consider what declarative knowledge learners have about the theory or knowledge base they are to reason with and use as a guide when constructing their responses. Where less theoretical background is provided within the tool, and more learner construction of response is required, it stands to reason that it is better suited for learners with more prior knowledge. Instructors must consider the cognitive complexity of the task inherent in the tool relative to learner readiness and its placement in the course or program. Tasks requiring greater contextual and experiential knowledge to successfully complete them should build upon learners' prior experiences. These variations in complexity also imply potentially greater responsibilities for instructors to support learning with demonstrations and feedback. A case or simulation exercise in itself, without an understanding of the learner, their existing knowledge, and the instructional strategies used to facilitate integration of new information with existing knowledge, runs the risk of failing to teach or provide evidence of learning.

The three tools also possess several similarities that suggest implications for implementation. They are each suitable for individual or whole-group assignments. They each offer instructors a way to present the same rich context for learning to their entire class. Normally, students see such rich representations of reality in internships, but instructors are unlikely to have all students placed in the same internship setting or even know the full details of each student's context. In this way, these tools can help provide equitable opportunities for experiential learning, and discussion and reflection upon it. In addition, the technological affordances of two of these tools make possible the repetition of situations with alternative outcomes based on different decisions. It is also possible to sequence their use to require successive independence and contextual complexity, which we might consider as fidelity to actual school settings. As the fidelity increases, so does the knowledge construction requiring interactions with context, and scaffolding this can promote transfer. If used instructionally as scaffolds to field-based practicum experiences or internships, in which students are in actual educational settings with real people and real consequences, such virtual experiences may promote positive effects on students' self-efficacy and increased utility and quality of their preparation. This can ready learners for subsequent active learning experiences (i.e., Cosner et al., 2018; Honig & Honsa, this issue) and internships set in actual school

contexts known to be so critical for their success (Crow & Whiteman, 2016; Orr & Orphanos, 2011).

## Conclusion

To emphasize the vitality of digital cases, digital simulations, and clinical simulations in leadership preparation, we propose (inter)active learning pedagogy, emphasizing the reciprocal contributions of learner and modality. The (inter)activity of learning in principal preparation programs is important when we consider the practice required for the performative nature of standards, and the development of self-efficacy in prospective leaders. Opportunities in ELPPs for future administrators to rehearse leadership practices that situate their learning in rich contexts (Brown et al., 1989; Hallinger, 2018; Lave & Wenger, 1991) are essential to the development of qualified school leaders. With this understanding, ELPP faculty should review the extent to which their coursework provides access to both active *and* (inter)active learning pedagogies, and how they relate to, scaffold between, and enrich each other as pedagogies along a continuum of decreasing abstraction and increasing embeddedness in the field.

### Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

### Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: The first three authors acknolwedge the generous support of the University Council of Educational Administration for the research and authorship of this article.

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