Teaching as a Clinical Profession: Adapting the Medical Model

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Abstract

One influential way of thinking about teaching is to conceive of it as a clinical profession, similar in important ways to medicine. However, fundamental differences between doctors’ and teachers’ practice limit the usefulness of the medical model. How can we adapt our understandings of clinical practice in light of the unique aspects of teaching and the context of teachers’ work? In this article, we explore the requirements of the central clinical activities of diagnosis, treatment, and inference in teaching; how teachers tend to perform them; and how their performance is shaped by the context of teachers’ work. We elaborate each clinical activity’s characteristics and explore the unique features and limitations of teaching in relation to it. To account for teaching’s unique qualities, we propose adapting the clinical acts of diagnosis, treatment, and inference to include, respectively, prioritization and noticing, disciplined improvisation, and room to maneuver.

Keywords

teacher knowledge, teaching context, practice-based teacher education

How we think about teaching is consequential for how we engage in the practice, govern it, envisage its improvement, prepare its practitioners, and study it. One influential way of thinking about teaching is to conceive of it as a clinical profession, similar in important ways to medicine. Teachers, like doctors, it is argued, should base their practice on the best available research evidence. Just as doctors diagnose and treat patients, it is argued, teachers must make sense of their students’ learning needs and deliver appropriate instructional remedies. Furthermore, teachers, like doctors, need to exercise judgment, which can be cultivated through clinical experience (Burns & Badiali, 2018). This comparison of teaching and medicine has been criticized, however, in part due to fundamental differences between the professional activities and knowledge bases of education and medicine (e.g., Atkinson, 2000; Hammersley, 2004; Wrigley, 2018). This debate has been largely cast in dichotomous terms: whether or not teaching should be evidence-based; whether or not educational research should employ randomized controlled trials to uncover “what works”; and, more broadly, whether or not the teaching profession can and should adopt the medical model of clinical work. In this article, we transcend these dichotomies by asking how we can expand our understandings of clinical practice in teaching by adapting the medical model in light of teaching’s unique characteristics and context. We argue that such an adaptation of the medical model can place teaching as a clinical practice on firmer ground, thereby better informing theory and action in teacher education and professional development.

In presenting our argument, we review scholarship that explicitly calls for strengthening the clinical foundations of teacher education, highlighting the key features of clinical work that have been translated from the medical model into teaching: clinical reasoning, evidence-based practice, multiple knowledge bases, and the centrality of the client. Next, we discuss the possibilities and limitations of teaching as a clinical practice. This discussion is guided by and organized according to Abbott’s (1988) framework for analyzing the central activities of clinical work: diagnosis, treatment, and inference. To explore the requirements of these clinical activities in teaching, how teachers tend to perform them, and how their performance is shaped by the context of teachers’ work, we draw upon research on classroom instruction, teacher cognition, and the sociology of teaching. We elaborate each clinical activity’s characteristics and explore the unique features and limitations of teaching in relation to it. Finally, to account for teaching’s unique qualities, we propose extending the clinical acts of diagnosis, treatment, and inference to include, respectively (a) prioritization and noticing (Sherin et al., 2011), whereby teachers allocate their attention to competing student needs and concerns; (b) disciplined improvisation

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Translating the Medical Model Into Teaching and Teacher Education

Many critics view contemporary teaching practice as overly haphazard, insufficiently informed by evidence and imprecise in the way it addresses students’ learning needs (P. Davies, 1999; Hargreaves, 1996; Slavin, 2002). Versions of this criticism have echoed in debates about the role of research evidence in educational practice and about appropriate research methods for informing practice (Connolly et al., 2018; Nelson & Campbell, 2017). Some critics would like teaching to emulate the medical model, through the elaboration of the research base regarding students’ learning needs and optimal strategies for addressing them, and by training teachers in the art and science of educational diagnosis, treatment, and inference (Alter & Coggshall, 2009; Grossman, 2008; Kriewaldt & Turnidge, 2013). Aspects of this program have also been promoted by policies that mandate basing educational interventions on solid research evidence in the United States (e.g., Every Student Succeeds Act, 2015), in Canada (Campbell & Fulford, 2009), in the United Kingdom (James & Pollard, 2011), and across Europe (Gough et al., 2011). In this way, in Slavin’s (2002) memorable formulation, education might be “dragged kicking and screaming into the 20th Century” (p. 16).

Scholars seeking to base teaching on the medical model expect teachers to employ clinical reasoning processes, to base judgments on evidence, to develop practice on multiple bases of scientific knowledge and, most importantly, to identify the client’s needs, define their problems, and provide effective treatment (Alter & Coggshall, 2009; Burn & Mutton, 2015; Kriewaldt & Turnidge, 2013; McLean Davies et al., 2013). In the following section, we discuss how education scholars have translated into teaching these four aspects of the medical model.

First, it is argued, teachers should engage in clinical reasoning to respond to complex situations arising in practice. Such clinical reasoning involves a logical process of decision making adopted from the medical model of professional work: gathering relevant information about the client, depicting the client’s state in relation to a particular problem, and classifying the problem through a formal diagnostic system, and choosing and enacting appropriate treatment (Abbott, 1988). Specifically, teachers are expected to collect and analyze data, on the basis of which students’ learning needs to plan an appropriate intervention. They are then expected to assess the outcomes of the intervention and reconsider their diagnosis to direct future action (Kriewaldt & Turnidge, 2013).

In line with the above features of clinical reasoning, advocates of the teaching as a clinical profession agenda recognize the centrality of the client in teaching (Alter & Coggshall, 2009). Therefore, for teachers to be clinical “in the nature of health professionals,” they should “‘diagnose’ individual student’s learning and provide appropriate ‘prescriptions’ for improvement” (Dinham, 2013, p. 227). In this vein, the literature on teacher professionalism increasingly recognizes diagnosis of learning as a key teaching competence (e.g., Edelenbos & Kubanek-German, 2004; Klug et al., 2013). The act of diagnosis in teaching has been interpreted in various ways: as assessing students’ learning needs in general (Grossman, 2008); as understanding students’ learning behaviors to recognize difficulties (Klug et al., 2013); as predicting student achievement (Feinberg & Shapiro, 2003); and as detecting learning problems or disabilities (Taylor et al., 2000). We see each of these actions as necessary components of teachers’ diagnostic responsibility, though, as we argue below, they are insufficient. Disregarding the complexities of classroom settings, such interpretations fail to fully capture the distinctive nature of diagnosis in teaching.

Third, throughout the aforementioned process of clinical reasoning, teachers are expected, like medical doctors, to adhere to evidence-based standards of practice (Sackett et al., 1985). In the study of teaching, education scholars use the term evidence-based practice primarily to mean either (a) that the work of teachers should be based upon research evidence (Hargreaves, 1996), especially with regard to “what works” (Slavin, 2002), or (b) that teachers should establish
and use “evidence developed by observing, questioning and collecting data from each . . . student to make judgements about how to deliver high quality outcomes” (Kriewaldt & Turnidge, 2013, p. 106). This stance calls for transforming both educational research and practice. Researchers are expected to provide more evidence of “what works,” which practitioners are expected to regularly review and apply to their practice (Biesta, 2007).

Finally, like other clinical professions, teaching in this approach is viewed as a complex activity which requires general knowledge (e.g., about student learning) and specialized knowledge particular to the domain of expertise (Alter & Cogsshall, 2009). Research knowledge is expected to direct teachers’ work by stipulating new diagnostic definitions and innovative forms of treatment to inform professional judgment (Burn & Mutton, 2015; Shalem, 2014). The complexity of educational practice necessitates building on multiple bases of content knowledge, pedagogical knowledge, and pedagogical content knowledge (Berry et al., 2008; Shulman, 1987). These bases draw on various scientific disciplines such as the subject discipline, sociology, psychology, and philosophy, and also on specialized domains such as discipline-specific didactics, learning theory, instructional technology, and special education. Proponents of the medical model have critiqued educational research and theory for failing to adequately inform teachers’ day-to-day thinking and practice (e.g., Bennett, 2013; Grossman, 2008). They call, therefore, for strengthening educational knowledge production through the use of more rigorous methods, greater focus on practically relevant issues, and the cumulative integration of findings (Connolly et al., 2018).

**Criticisms of the Medical Model**

Scholars have severely criticized the adequacy of medicine as a model for teaching. Some have stressed problematic terminological differences between the two fields. For example, the medical terms *client* and *problem* may suggest a deficit model of teaching (Dinham, 2013), focused on fixing student shortcomings rather than nurturing their assets. Furthermore, the terms *evidence-based* and *research-informed* may valorize scientific evidence over practitioner judgment (Conroy et al., 2013). Other critics have highlighted fundamental differences between education and medicine, especially vis-à-vis the nature of professional action and the meaning of evidence (Bieta, 2007; Pirrie, 2001; Simons, 2003). Others criticize the model’s disregard of the contested nature of educational goals and values, noting that an exclusive focus on “What works?” obscures thorny ideological, moral, and political issues about “To what end?” and “For whom?” (Atkinson, 2000; Elliott, 2001; Hammersley, 1997). In particular, the focus on measurable individual student outcomes can eclipse equity and social justice as ends in themselves, leading to delegitimization of the purpose of effectively teaching all students as a desired professional end (Cochran-Smith, 2008).

Similarly, policy reforms promoting the use of evidence in teacher education emphasize the professional knowledge base at the expense of the moral purposes of teaching (Biesta, 2012). Finally, scholars have critiqued the neo-liberal, managerialist values underlying the notion of evidence-based education and its top-down approach to educational improvement (B. Davies, 2003; Ridgway et al., 2000).

The aforementioned criticisms inform our discussion of the medical model in what follows, though—unlike these critics—our goal is to expand our understanding of teaching as a clinical practice, rather than dismissing it.

**Problems With Applying the Medical Model of Clinical Work to Teaching**

Abbott (1988) argues that professions exist within interacting systems, in which professionals compete for jurisdiction over professional work. Such competition, he claims, takes place in various social arenas, most importantly, through practitioners’ actual work. To maintain professional jurisdiction, professionals need to display effectiveness in three areas of clinical practice: the ability to diagnose the client’s problem, the ability to treat the problem, and the ability to infer about a client’s problem when the connection between diagnosis and treatment is obscure. According to Abbott, these areas are informed by an abstract system of professional knowledge which provides new diagnoses, forms of treatment, and other sources of evidence to support practitioners’ professional judgment. Diagnosis and treatment originate in the nature of professional work. In his theoretical framework, Abbott (1988) generalized these clinical activities into a broad heuristic for analyzing professional work. Abbott considers the ability to connect diagnosis, treatment, and inference with a formal body of professional knowledge as an additional resource for strengthening jurisdictional claims.

Numerous studies have applied Abbott’s theoretical framework to the study of teaching and the teaching profession, investigating, among other issues, jurisdictional competition between teachers and other professionals (e.g., Isaksson & Larsson, 2017); the role of teacher education in the professionalization of teaching (e.g., Grossman, 2008; Tamir & Wilson, 2005); teacher knowledge and performance (e.g., Glazer & Peurach, 2015; Sykes et al., 2010); and the nature of teaching as professional work (e.g., Glazer, 2007; Shalem, 2014). In this study, we use Abbott’s theoretical framework as a heuristic for analyzing the key activities of teaching as a clinical practice. We review, in turn, the challenges of diagnosis, treatment, and inference in teaching.

**Competing Aims in Teaching and the Challenge of Defining the Problem**

The point of departure in Abbott’s theory is that human problems “amenable to expert service” (p. 35)—such as sickness, poverty, and violence, and the need for creative solutions in
legislation, mobility, housing, and so on—are the central factor around which professions are organized. Put simply, human problems pose tasks for professions to handle and solve. Professions offer interpretive frames for understanding these problems and for convincing the public that they and only they should be entrusted with these problems’ treatment. Once a particular profession’s interpretation of a problem is publicly accepted, professionals can claim a monopoly over this service. Professions competing for jurisdictional control over a problem describe its qualities very differently. For example, in a jurisdictional dispute, alcoholism has been cast as a biological problem by medical doctors, a social problem by criminologists, a spiritual problem by clergy, and a mental problem by psychologists and psychiatrists. For Abbott, clinical work is anchored in the professional tasks that human problems pose. Professional knowledge is directed at defining these tasks, inferring about how to address them, and suggesting ways to treat them in keeping with the subjective qualities identified by the profession (biological, social, mental, aesthetic, etc.).

The human problem addressed by teaching is hard to pin down. Abbott (1988) contended that teaching was based on the organizational foundations of mass education (p. 39), which constituted the objective problem of education. However, he did not identify the subjective qualities of the tasks of education. We can find in education scholarship a variety of historical, sociological, psychological, and philosophical accounts of the aims of education (Hare, 1995; Marples, 1999). However, each account focuses on a particular social aim that schools and teachers strive to achieve but disregards or opposes others. This is well depicted in the debate about “education as the fostering of thinking rather than as the transmission of knowledge” (Lipman, 1988, p. 4). This debate, enjoined by philosophers such as Dewey, Russell, and Whitehead, focuses on the task of shaping children’s cognition in relation to subject matter. Dewey’s progressivism marks the bridging between disciplinary knowledge and the child’s psychology as a central task of teaching. However, such notions clash with romantic educational ideals, such as Rousseau’s and Neil’s, which seek to shield the child from cultural knowledge and social conventions that might impede his or her natural development and self-realization. Another focal debate juxtaposes education as the provision of learning opportunities, as an emancipatory process, or as the development of responsibility for others (Biesta, 2005). While some see the core educational task as caring for children’s well-being (Cohen, 2006; Noddings, 1984), others believe it to be cultivating young people’s reason, intellect, or discipline. Still others underscore education’s mission as a means of addressing social problems and of advancing social justice (Hyttén & Betze, 2011). These debates highlight the ideological constitution of teaching as a social practice, around which public agreement is hard to achieve (Egan, 2008; Lamm, 2002). Teachers’ personal goals for their work are similarly multiple and conflicting, just like the aims for education in the social sphere (Kennedy, 2006). These questions about the aims of education are not merely abstract, philosophical issues, but constantly impress themselves upon the attentive teacher in each and every lesson. For example, in a case study of dilemmas facing an Israeli primary language arts teacher, we found her juggling the following competing goals in just 7 min of instruction: teaching students to formulate complete answers, teaching students to comprehend a story, maximizing student participation, challenging individual students’ to refine their thinking, maintaining student engagement, affording space for pupil voices, managing student motivation, and providing corrective feedback (Lefstein et al., 2013).

**Diverse Learning Needs and the Challenge of Diagnosis**

Diagnosis, in Abbott’s theory, is a mediating clinical process in which the professional gathers relevant information from the client, which can then be categorized according to the professional knowledge system. Abbott distinguished between two diagnostic acts: (a) colligation, whereby the clinician assembles information about the client’s needs into “a ‘picture’ of the client” (p. 41); and (b) classification, in which the client’s assembled picture is associated with a legitimate problem as defined within the professional knowledge base. In this process, the clinician works according to professional rules that determine what kinds of evidence are relevant and valid. As in most cases there are several reasonable colligations, skillful diagnosis identifies “which is the real one” (p. 42). While diagnosing, clinicians “juggle” (p. 43) between their professional knowledge, the character of the client, and the structures of treatment.

Applied to teaching, even a restricted conception of teaching as devoted only to academic aims, student learning does not appear to readily lend itself to diagnosis. Unlike the objects of other professions (such as the human body, a building, an information system, and even normative behavior), the boundaries of consideration for facilitating learning are not easily delineated. With so many factors involved in the learning process, internal and external to the learner, it is hard to decide what information is relevant and what makes it valid. In such a state, assembling an adequate picture of the student’s needs requires numerous actions, such as assessing student prior content knowledge (Dochy et al., 1999), identifying student misconceptions and their conceptual and/or epistemological roots (Larkin, 2012), recognizing and interpreting ongoing student thinking (Cowie & Bell, 1999), estimating the student’s zone of proximal development (Allal & Ducrey, 2000), and detecting learning difficulties (Klug et al., 2013). In addition, colligation in teaching must also address the emotional, social, and cultural factors that shape student learning: motivations to learn (Skinner & Belmont, 1993); disciplinary, academic, and other identities (Calabrese Barton et al., 2013; Wortham,
chooses to wholly individualize instruction, the collective other students’ needs are inevitably put aside. If the teacher particular individual students and to the general state of the professionals who treat either an individual or a group provide (McCombs & Whisler, 1997). Hence, unlike other the primary recipient of the learning services that teachers other differences. In this discourse, the individual student is institutional conditions, socioeconomic status, disabilities, or make sense to define an entire classroom as the target client. Demands for standards-based teaching pressure teachers to uniform assessments that largely ignore student diversity ensure that students can demonstrate their competencies on (Tomlinson, 2000). In such working conditions, it would entail to infer through exclusion, by ruling out possible diag- noses according to outcomes of different treatments and challenging because student differences relate to a large variety of student characteristics (Suprayogi et al., 2017). Unsurprisingly, teachers encounter difficulties implementing differentiated instruc- tion in practice (Smit & Humpert, 2012).

According to Abbott, “treatment is organized around a classification system and a brokering process” (p. 44). In brokering, the professional takes information from the professional knowledge system and delivers results to the client through prescription. In prescription, general treatments are adjusted to the particularities of real clients. The diagnostic and treatment classification systems usually differ significantly. While diagnostic classification is organized according to distinct problems, the treatment system lumps these problems together according to common means of available treatment and often offers a combination or sequence of treatments for a particular diagnosis.

Framing the client in teaching is complicated. On one hand, the structural conditions of schooling organize multiple mixed-ability students into classrooms with which teachers work collectively for limited time periods (Brante, 2009). Demands for standards-based teaching pressure teachers to ensure that students can demonstrate their competencies on uniform assessments that largely ignore student diversity (Tomlinson, 2000). In such working conditions, it would make sense to define an entire classroom as the target client. On the other hand, the standards movement aims to ensure that teachers meet the needs of all students, regardless of institutional conditions, socioeconomic status, disabilities, or other differences. In this discourse, the individual student is the primary recipient of the learning services that teachers provide (McCombs & Whisler, 1997). Hence, unlike other professionals who treat either an individual or a group (Abbott, 1988, p. 40), teachers must simultaneously adjust their educational interventions both to the learning needs of particular individual students and to the general state of the entire classroom. During instruction within a whole class setting, when a teacher treats one student, the same treatment is applied to the others present. At this point in the lesson, the other students’ needs are inevitably put aside. If the teacher chooses to wholly individualize instruction, the collective social needs of the class as a group are ignored. As current conditions in schools make such individualized instruction practically impossible, the applicability of individualized treatment in the context of teaching is challenged.

The simultaneous targeting of both individual and group levels of student learning is central to two major conceptualizations of classroom teaching. First, in differentiated instruction (Waxman et al., 2013), teachers vary activities and content to meet the needs of each student, while steering the learning of an entire classroom (Thousand et al., 2007). In Abbott’s terms, in such a mode of instruction, the teacher delivers multiple prescriptions for various students that together comprise a more encompassing prescription for the progress of an entire classroom. Unlike social workers, for example, who practice community or group work in which they treat multiple clients with similar needs, treating students in the conventional mixed-ability classroom is challenging because student differences relate to a large variety of student characteristics (Suprayogi et al., 2017). Unsurprisingly, teachers encounter difficulties implementing differentiated instruction in practice (Smit & Humpert, 2012).

A second approach to attending to both individual and collective needs in the classroom stems from a sociocultural approach to learning, according to which individual cognitive development is mediated by social interaction (Vygotsky, 1978). In this view, knowledge is situated in cultural contexts and is co-constructed through processes of collaborative inquiry and meaning-making (Lave & Wenger, 1991). Teachers facilitate such processes by designing and guiding collaborative learning activities, and by using dialogue to develop shared understandings (Eun, 2010). Here, engaging a group of students in joint activity is critical for cultivating higher order cognitive functions. From Abbott’s perspective, the sociocultural theory of cognitive development offers subjective qualities of learning that justify the collective nature of treatment in classroom teaching. However, applied models of cognitive and social constructivism that grew from the sociocultural knowledge base are not only challenging to put into practice (Windschitl, 2002), but have not proven more effective for all students (Anderson, 2002; Liang & Gabel, 2005). Such findings suggest that teachers are hardpressed to meet the diverse learning needs of their students within traditional forms of schooling and assessment.

The Temporal Structure of Instruction and the Challenge of Inference

Inference in Abbott’s (1988) theory is necessary whenever the connection between diagnosis and treatment is ambiguous. Professionals reason about how to establish this connection by either exclusion or construction. Medical doctors tend to infer through exclusion, by ruling out possible diagnoses according to outcomes of different treatments and tests. Other professionals use construction to plan their conduct ahead of time, hypothesizing possible implications of
different moves and allowing for as many successful scenarios as possible (e.g., military tacticians construct a battle plan and envision enemy responses to maximize options for winning). In teaching, however, neither exclusion nor construction provide an adequate model of the inferential processes. Professions differ in the number of attempts that practitioners get to apply treatment (single- vs. multi-chance) and also in the number of steps through which they construe a logical chain of treatment. While all professionals, according to Abbott, attach probability of error to each step and to the entire logical chain, only multi-chance practitioners can develop parallel chains, gather information about their outcomes, and cease any chain when the likelihood of error exceeds a threshold of feasibility.

Inference in teaching is challenged by the temporal structure of instruction and the objective constraints it imposes on teacher reasoning and decision making. During the lesson, the fast-moving pace of instruction requires teachers to respond in the moment to many simultaneous events (Kennedy, 2006). In such intensive activity, teachers are flooded with sensory information and must make multiple decisions in a constantly changing situation (Clark & Peterson, 1986). Professional reasoning, in the medical model, requires time in which action is held frozen to create mental space to process information and engage in rational decision making. Such reflective processes also necessitate detachment from the object of practice, and the creation of a workable representation of the situation (e.g., an architectural drawing, or a chart of physical and biological measures) that can be scrutinized and manipulated (Schön, 1987). During instruction, however, such inferential reflection-in-action is challenged in several ways (Roth et al., 2001): first, teachers can rarely pause the ongoing flow of the lesson to take the time to collect information, analyze causes and implications, weigh alternatives, and make an informed and calculated decision regarding every action. The teacher constantly responds to the situation as it unfolds, even when choosing to withhold response. By taking time to reflect, the teacher risks losing momentum or crucial information about students’ experiences and learning states. Second, due to the participatory nature of classroom teaching, the teacher is physically, cognitively, and socially embedded in the classroom experience. Therefore, while teaching, it is extremely difficult to achieve a detached standpoint from which one can objectify and theorize their own practice to guide and inform professional decisions. As mentioned above, the task environment of teachers’ work during instruction is highly complex, involving multiple activities, constant change, unpredictability, and an enormous load of data (Kagan, 1988). Expert teachers use well-formed schemata that unconsciously chunk data to reduce their cognitive load, narrow the problem space, and screen information to effectively respond to classroom events (Berliner, 1987). It appears that during instruction, the teacher’s mental resources are stretched. Research suggests that coping with the classroom environment requires cognitive adaption though the establishment of routines while at the same time demonstrating flexibility in classroom practice (Berliner, 2001). This setting restricts teachers’ capacity to process information, estimate probabilities, and make rational, conscious decisions in accordance with the medical model.

Inference in teaching also takes place in lesson planning, through which teachers “formulate a course of action for carrying out instruction” (Borko & Shavelson, 1990, p. 313). In Abbott’s terms, through planning teachers can construct logical chains between diagnoses of learning needs and their treatment ahead of time. We identify two principal ways in which inferential construction is restricted in teaching. First, lesson plans are limited by the fact that students’ responses to teachers’ plans are always unpredictable. Hence, a tightly planned sequence of interventions aimed at specific outcomes, as suggested in the mode of construction, is challenged by the context of classroom teaching (Huberman, 1993). The second limitation stems from profound logical differences between lesson planning and clinical inference through construction. Clinical construction begins with an initial diagnostic assumption. On that basis, the professional builds logical chains of intervention that intend to eventually treat the diagnosed condition. Lesson planning begins with predetermined content and/or skills that students are expected to learn (as defined by the discipline, curriculum or teacher). With this in mind, teachers design sequences of instructional activities through which they can mediate such content and skills to students during the lesson. Only then can teachers consider possible difficulties, misconceptions, and challenging situations that students might experience during their participation in the planned lesson. On many occasions, teachers also base their lesson planning on their interpretation of what happened in previous lessons, which allows for some diagnostic considerations. Nevertheless, the general logical order of the two processes are fundamentally different.

Adapting the Clinical Model for Teaching

The preceding discussion suggests that current ideological and organizational structures of schooling pose objective conditions that challenge teachers’ engagement in the clinical acts of diagnosis, treatment, and inference as conceived in the medical model. This does not mean that these clinical acts are completely irrelevant to teaching. Teachers can and do engage in some forms of clinical reasoning and action (Donnelly, 1999), and teaching can be and to a certain extent is informed by a principled body of research-based knowledge. It is precisely teaching’s complexity that necessitates clinical problem solving. However, based on the above critique of the application of the medical model to teaching, and drawing on existing analyses of teachers’ thinking and practice, we suggest that the clinical concepts of diagnosis, treatment, and inference can be productively adapted. To this end, we draw together several influential conceptualizations that capture key properties distinctive to teaching: noticing (Sherin et al., 2011), disciplined improvisation (Sawyer,
Adapting Diagnosis to Include Noticing

Diagnosis requires assembling an image of the client’s situation and associating it with a formally defined problem. However, as indicated in previous sections, the numerous factors to which the teacher must attend to define the students’ various learning needs challenge the possibility of performing clinical diagnosis as suggested in the medical model. In the ever-changing classroom situation, recognizing students’ learning needs first requires attention to some problem or situation. Research on teaching affirms that while teachers constantly notice many things, there is also much that they do not notice. Flooded with multiple sources of sensory data, teachers select, knowingly or tacitly, to attend to some environmental elements, while ignoring other elements (Sherin et al., 2011). Hence, any assembled image of the student or the classroom is inevitably partial, at best. Noticing involves marking (Mason, 2011) or selective attention (Sherin, 2007), in which teachers allocate attentional resources. This allocation is rooted in the teacher’s interpretation of classroom events, in the attribution of meaning and significance to a particular occurrence or interaction (Sherin et al., 2011). The facets of noticing (attending, deciding and interpreting) are interdependent, mutually reinforcing and cyclical, as events to which the teacher attends stimulate interpretation, which, in turn, further prompts the teacher to attend to particular kinds of events (Sherin, 2007). This process could be viewed as part of the diagnostic process, through which teachers identify features of the situation and associate them with broader interpretive frames or professional vision (Goodwin, 1994) that further direct their reasoning. However, as classroom events are multidimensional, simultaneous, and unpredictable (Doyle, 1977), we propose that, in deciding to which event to attend, the teacher, consciously or unconsciously, prioritizes some needs and goals over others. Moreover, educational problems are “wicked” (Churchman, 1967) in that they are ill-formulated, involve confusing and incomplete information, multiple clients, conflicting values, and unpredictable consequences (Yinger, 1986). As such, every educational event, once attended to, reveals divergent needs of multiple students and multifaceted aspects of learning. In sum, diagnosis in teaching involves noticing and prioritization as inextricably related to framing and interpreting the clients’ needs.

Adapting Treatment to Include Disciplined Improvisation and Bricolage

As previous sections suggest, the possibility of teachers’ adjusting a method of treatment to individual student needs, while also attending to the collective needs of the classroom as a group, is limited. Rather than adjusting a formal method of treatment to student characteristics, Abbott’s brokering in teaching requires creating in the moment a situated method of treatment in which the teacher and students take part. As students’ responses are unpredictable, shaping classroom interaction in ways that lead to the emergence of particular understandings cannot be fully predetermined. Rather, treatment in teaching integrates the teacher’s prior vision for the lesson with the evolving path of student thinking, feeling, talking, and being as these unfold in interaction. In addition, teachers’ prescriptions are not determined outside of ongoing classroom interaction; but rather, they are embedded in the processes of its collaborative construction. Such treatment is not entirely disconnected from planned structures, activities, and materials, but requires a high degree of inventiveness and flexibility to reshape the physical, mental, and discursive materials that were prepared in advance and amalgamate them with resources and ideas that emerge spontaneously.

Understanding the unique qualities of treatment in teaching can be facilitated by the metaphors of disciplined improvisation (Sawyer, 2004) and bricolage (Huberman, 1993). Disciplined improvisation begins with a definition of the general situation and a set of guidelines for action and develops as continually responsive to the students and to new situations or events (Borko & Livingston, 1989). Bricolage is a metaphor suggested by Huberman (1993) to characterize his own view of improvisation in teaching. The practitioner of bricolage, the bricoleur, “works with his hands and uses devious means compared to those of the craftsman . . . A Jack of all trades or a kind of professional do-it-yourself man” (Levi-Strauss, 1966, pp. 16–17). Both metaphors relate to creative actions that are performed in the moment based on available (physical, mental, and interactional) materials. Applied to teaching, while the first emphasizes the responsive, participatory, and interactive nature of instruction, the latter captures its materialistic sophistication and inventive character. The teacher commences the lesson with an outline of activity that is adapted during instruction in light of students’ reactions (Yinger, 1987). The enacted lesson is co-constructed by teacher and students interacting together (Erickson, 1982; McDermott & Tylbor, 1983). This interactive process necessitates improvisational performance, which enables the teacher “to manage the participatory aspects of social interaction—turn taking, the timing and sequence of turns, participant roles and relationships, the degree of simultaneity of participation, and rights of participants to speak” (Sawyer, 2004, p. 15). Such interactive collaboration cannot be wholly planned in advance. Nonetheless, improvisation operates within structure just as interactive instruction is grounded in pedagogical goals and frameworks (Sawyer, 2004). Hence, skillful treatment in teaching lies in effectively using the creative tension between structured composition and responsive improvisation (Yinger, 1987).

In addition to its interactional aspects, instruction also involves using various materials and artifacts as scaffolds for student learning. Approaching a task while practicing bricolage, according to Levi-Strauss (1966), first requires...
reviewing the already existing set of tools and materials to see what might be useful in the context of some present problem. While professional tools often “have one definite and determinate use” (p. 18), the bricoleur’s instruments are open to a variety of uses. Unlike the methodological application of treatment, bricolage involves rearranging an existing set of means to create new structures, as an ad hoc response to the environment. Much of teachers’ work is like this (Hatton, 1988). The materials that the teacher planned for the lesson and those that come to mind from past experiences meet the particular needs that emerge at a specific point in the lesson (Huberman, 1993). In such a practice, the teacher reconstructs preexisting materials and integrates them with the evolving resources that students bring along, such as their prior knowledge, their oral and written answers, and their capacity to facilitate their peers’ learning (Gershon, 2006).

Adapting Inference to Include Room to Maneuver

Professional decision making, as depicted in the medical model, requires time and detachment from the object of practice. As argued in previous sections, these are not available during instruction due to the temporal structure of classroom activity and teachers’ immersive participation in it. Furthermore, teachers’ work cannot be based solely on conscious, rational considerations, but also draws on intuitive, holistic responses (Korthagen, 1993; van Manen, 2015). Nevertheless, even under the cognitive intensity of interactive instruction, teachers must make numerous decisions during the lesson. Some scholars (Donnelly, 1999; Gorodetsky & Barak, 2004; Lawless & Roth, 2001; Roth et al., 2001) have attempted to capture teachers’ unique ability to make decisions while absorbed in the teaching process and remaining attentive and responsive to the classroom. These scholars conceptualized the teacher’s experience during instruction as a form of profound embeddedness of the self within the classroom situation. Thus, the teacher becomes an inherent part of the situation and grasps it as a whole, and cannot, therefore, exhaustively analyze it (Donnelly, 1999). This state of mind is constituted by possibility: “the readiness for action correlative to the current situation and without cogitating next moves in a detached way” (Roth et al., 2001, p. 186). Experienced teachers develop an inherent sense of what it means to be themselves-in-that-classroom in various situations. This intrinsic notion develops gradually, as the teacher’s familiarity with the classroom grows. In that process, the teacher generates a repertoire of possible ways of being which include ways of acting, talking, feeling, and so on. During instruction, then, the teacher’s referential awareness does not objectify the self as separated from the experienced classroom event and the teacher’s actions are driven by an absorbed rather than representational intentionality (Gorodetsky & Barak, 2004). Roth et al. (2001) used the term room to maneuver (in German, spielraum) to describe teachers’ developing space for moving between possibilities in problematic or unexpected classroom situations, without reflecting. This notion suggests that the growing familiarity with the world of the classroom expands teachers’ possibilities for acting and approaching problems without having to explicitly and consciously conceptualize and reflect on the situation. Thus, room to maneuver points to a state of readiness for action within the contingencies of the classroom. It highlights the maintenance of multiple possible options at any given moment in a participatory manner and staying open to emergent unpredictable responses in the classroom. Such a conceptualization corresponds with the unique objective qualities of teaching that generate the contingent, participatory, and collaborative nature of classroom instruction.

Concluding Remarks

We have argued that to strengthen the clinical grounds of teaching, we need to shift the debate from endorsing or rejecting the medical model to how it might be best adapted to the realities of school teaching and the nature of teachers’ classroom work. We identified some of the unique challenges of classroom instruction, deriving from objective conditions of education and schooling, and suggested expanding the conception of key aspects of teachers’ clinical work accordingly. Naturally, teachers can in some circumstances overcome some of the challenges we have described, and are sometimes able to diagnose, treat, or infer in ways that approximate the medical model. However, given the conditions we have highlighted, such occasions are rare, and typically necessitate extraordinary resources or conditions (e.g., tutoring an individual student outside lesson hours), which are not commonly available in most schools.

The adapted conception developed here has some important implications for how we think about teacher professionalism. First, our conceptual model raises questions about the role of research-based knowledge in professional conduct and learning. From the core processes of perception during classroom instruction (prioritization and noticing), our conceptualization highlights the central role of teachers’ interpretations of educational situations. Hence, clinical reasoning in teaching is unavoidably charged with value and ideology, as teachers prioritize some sources of evidence about student needs and learning over others. As our conceptual model stresses, this value-laden nature of educational practice is also grounded in the contested nature of educational aims, and the fact that no single definition, explanation, or solution can capture an educational situation in its entirety. Thus, at any given moment during instruction (and afterwards), teachers make sense of educational situations and diagnose student needs in accordance with their prioritizations of different educational interests, goals, theories, and tools, which are informed by research to varying degrees. Research plays a role in educational diagnosis, treatment, and inference, but they are necessarily underdetermined by it. Evidence, experience, and professional vision are interrelated. As teachers
choose evidence based on their professional visions, such evidence also informs their visions and choices while teaching. Moreover, our analysis shows that definitive answers to educational problems cannot be provided by research, for the sole reason that consensus about the nature of those problems is unattainable. We have highlighted challenges with regard to defining the aims of education, creating a coherent diagnostic system for teaching, and the teacher’s ability to diagnose, treat, and infer about the client’s problem. In Abbott’s terms, these challenges mark weak ties between teachers’ actual work and the professional tasks they strive to perform. Such weaknesses make teaching more vulnerable to “outside interloping” (Abbott, 1988, p. 45) by competitor professions and inevitably limit teachers’ claims for jurisdictional control (Isaksson & Larsson, 2017; Wilkinson, 2005). Such limiting conditions in teaching caution us to not develop unrealistic expectations about the potential of evidence-informed teaching, clinical teacher education, and randomized control trials to advance teacher professionalism.

The theoretical constructs upon which we have built our model are not new and, to some extent, their implications for teacher education have been discussed elsewhere (DeZutter, 2011; Hutchinson, 2011; Roth et al., 1999). Our conceptualization adds to this scholarship by incorporating these isolated constructs into a unified model of clinical work and considering their implications for the core clinical tasks of diagnosis, treatment, and inference in teaching. Hence, rather than treating them as obstacles to the development of teaching as a rational, scientific practice (Hatton, 1988), we acknowledge their essential contribution to understanding how teachers think about educational problems and how they generate creative professional solutions to these problems in real classroom situations. For example, for the sake of providing suitable professional service, even as teachers use theoretical diagnostic definitions to classify student needs, it is essential that they prioritize available theoretical lenses to frame these various needs to set their educational goals. Similarly, even when aiming to implement treatments proven effective, it is vital that teachers improvise and remain flexible to recompose such treatments in response to classroom contingencies (as in bricolage). Inevitably, at the very heart of these twofold clinical processes, we are likely to find conceptual, ethical, and practical tensions between different educational approaches, values, and interests. Nonetheless, professional learning processes can make explicit and explore these tensions to enhance teachers’ understanding of the complex relations between ideology, knowledge, context, and practice in teaching. For instance, it has been argued that developing room to maneuver requires expanding the teacher’s familiarity with different practices within various classroom contexts for handling a range of educational situations (Gorodetsky & Barak, 2004). We argue that professional learning that expands inferential capabilities also necessitates examining these experiences (practice) not only in light of evidence regarding its impact on student learning (knowledge), but also in relation to the aspired and enacted educational values these experiences realize (value) and in consideration of how the social and contextual factors of a particular classroom shape these experiences (context). In a similar vein, learning how to set educational objectives through diagnosis should not only take into account data about individual students, but also acknowledge the multiple potentially relevant educational goals (Kennedy, 2006) through which such data can be evaluated and how these resonate with often contradictory ideological stances (Lamm, 2002).

By highlighting the ideological grounds of teachers’ work, the conceptual model proposed here raises questions about how social contexts, values, and aims, which are inevitably intertwined with the technical elements of professional practice (Philip et al., 2019), might be addressed in the processes of learning to teach and teacher professional development. Furthermore, by problematizing the clinical foundations of teaching, the model questions some of the ways that have been employed to handle the enduring complexities and challenges of teacher education (Labaree, 1998). Some seek to escape from these challenges by embracing (or rejecting) the clinical model offered by medicine. We argue here that, rather than clinging to a dichotomized view of teaching, we should explore ways of enhancing teachers’ awareness of their profession’s inherent complexities and of extending their learning to include the adapted aspects of clinical practice. Such an agenda can potentially strengthen teaching’s clinical foundations without obscuring its essential components.

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) received no financial support for the research, authorship, and/or publication of this article.

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