


Governing teachers through datafication: Physical–virtual hybridity and language interoperability in teacher accountability

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Abstract

In this paper, we draw on Foucault's and Deleuze's theorisations of discipline and control, respectively, to understand a teacher accountability system in the US state of Texas: the *Texas Teacher Evaluation and Support System* (hereafter, *T-TESS*). Specifically, we focus on the interplay of physical and virtual modes of governance – which we develop here as *physical–virtual hybridity* – and the techniques that make these physical and virtual domains compatible via *language interoperability*, with T-TESS deployed as a representative empirical case to show how such technologies work to govern teacher subjectivity. First, in-person appraiser meetings and observations re-code teachers' linguistic behaviours, so their physical bodies and practices can become legible to and interoperable with the hybrid T-TESS system. This avoids any possible syntax errors between the linguistic expression of physical teacher speech and the digital coding language of T-TESS. Second, these digital bodies of data can now be viewed as proxies for the physical teacher body in the classroom, allowing the constant modulation in physical space (teacher bodies) and digital space (bodies of data). This is the physical–virtual hybridity of T-TESS, whereby discipline and control work symbiotically to govern both the physical and the digital expressions of teachers and their teaching. In this way, the disciplining of teachers' language has profound effects on teachers' bodies, both corporeal and digital.

Keywords

T-TESS, datafication, discipline, control, physical–virtual hybridity, language interoperability, teacher accountability

Introduction

Like other public domains grappling with the unprecedented and often unseen influence of big data and related analytic techniques, education has become a key target of the 'data deluge' (Anderson, 2008; see also Kitchin, 2014), as data scientists, technicians and statisticians secure an increasingly prominent role in education practice and policy (Williamson, 2021; Wyatt-Smith et al., 2021). At the same time, schools are increasingly subjected to external modes of accountability that both rely upon and produce new forms of data (Grek et al., 2021). These might include standardised large-scale assessments to measure student and school performance, value-added models to measure teacher effectiveness and many other quantifying instruments used for measuring the absolute and relative quality of a system, school, teacher or student.

As these techniques emerge and adapt to address new demands and available technologies, scholars have looked to varying theoretical paradigms to make sense of the rapidly shifting epistemologies and ontologies of humans and

society in an increasingly 'datafied' world (see, for instance, de Freitas and Dixon-Román, 2017; Kitchin, 2014; Lupton, 2016; Smith, 2016; van Es and Schäfer, 2017). Foucault's disciplinary society (1977) and Deleuze's control society (1992) have been especially useful to understand the 'datafication' of teachers, students and other schooling processes (de Freitas and Dixon-Román, 2017; see also Bradbury, 2019; Langman, 2021; Thompson and Cook, 2014; Thompson and Sellar, 2018). For brevity, we refer here to the *disciplinary society*, broadly speaking, as one governed by physical and discrete instruments, as opposed to the virtual and continuous instruments that govern the *control society*. Beyond education, we would also observe the broader trend towards the

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expanding *dataveillance* – or liquid surveillance (Bauman and Lyon, 2013) – of professionals within the public sector and across different professional domains (e.g. medicine, law) in many post-industrial societies (see also Evetts, 2009, 2011). In this respect, there is arguably great benefit to better understanding the roles of discipline and control for organising how work and workers are governed, as well as how society and work are organised writ large (Zuboff, 2019).

In this paper, we have been inspired by Foucault's and Deleuze's theorisations of discipline and control, respectively, as we attempted to understand a teacher evaluation system in the US state of Texas: the *Texas Teacher Evaluation and Support System* (hereafter, *T-TESS*). In the United States, Texas has routinely led the way in adopting new technologies for evaluating teachers and their practice. Over the past several decades, their relentless commitment to teacher accountability has evolved into a multifaceted infrastructure that draws on physical and virtual tools for measuring and governing teacher performance (see Holloway and Lewis, 2021). Thus, we focus on the interplay of physical and virtual modes of governance – which we develop here as *physical–virtual hybridity* – and the techniques that make these physical and virtual domains compatible via *language interoperability*. We find T-TESS an interesting empirical case because it requires physical and virtual spaces working together to assemble what might be considered one of the most comprehensive teacher accountability systems globally. T-TESS then exemplifies what others have described as the 'control society' being overlaid upon the 'disciplinary society', whereby the technologies and rationalities of performativity and surveillance transition to (but do not entirely replace) those of datafication and dataveillance (cf. Deleuze, 1992; see also Bradbury, 2019; Thompson and Cook, 2014). Using these concepts as a starting point, we extend this literature by bringing together and developing the concepts of *language interoperability* and *physical–virtual hybridity*. We use T-TESS as an empirical case to show how such technologies work to govern teacher subjectivity by altering (or re-coding) teachers' behaviours, so that their physical bodies can become interoperable with the hybrid T-TESS system.

We pay particular attention here to how such moves implicate the teacher subject, insofar as they are now thoroughly recast in the image of data (Daliri-Ngametua et al., 2022; Lewis and Holloway, 2019), with a specific focus on how T-TESS language is central to (re)making teacher subjectivity. That is, both conventional and new(er) digital modes of observation and evaluation operate together to synchronise and align teachers (materially and symbolically) with the online technologies that govern their practices, bodies and subjectivities. Theoretically, we show the importance of viewing the physical and virtual together to better understand the symbiotic relationship between these two domains (see also Smith, 2016). As others have

argued, the 'control society' cannot exist without the 'discipline society' (see also Bradbury, 2019; Thompson and Sellar, 2018), and vice versa, whereby discipline and control each provide the necessary inputs and enabling conditions for the other to flourish and be enacted. To extend this argument, we contend that for the physical and virtual dimensions of accountability to operate coherently, 'language interoperability' between these two domains becomes a necessary feature of the overall T-TESS system (see also Sellar, 2017). In our case, the T-TESS framework provides such an interoperable and recognisable language, which makes it possible for material human bodies to be disciplined (cf. Foucault, 1977) while, at the same time, 'unbodied' *data-proxies* (Smith, 2016) to be simultaneously controlled (cf. Deleuze, 1992).

An important point that we will revisit throughout the paper is that the new technologies of T-TESS (e.g. online data tracking, reporting) are not necessarily new in *purpose*, especially in relation to their calculative and evaluative functions. Here, we follow Parisi (2017), who reminds us that calculative techniques do not require digital technologies (see also Gulson and Webb, 2018). However, the *digital* operation of T-TESS does produce ontological shifts that we see as most significant in (re) shaping teachers and teaching, and particularly in terms of how physical spaces and practices must be modified to accommodate these digital requirements. To this end, we begin by articulating how we are theorising and using datafication, with a focus on bodies and language. Then, we shift to our empirical focus to consider how T-TESS has been developed and enacted within the schooling system of the US state of Texas, and especially how it represents both a linear evolution of and radical departure from existing teacher accountability practices. Finally, informed by Jackson and Mazzei's (2013) encouragement to 'think with theory', we offer insights into how the datafication practices of T-TESS work to govern teachers through interoperable language and physical–virtual hybridity, or what we see as techniques of discipline and control. In so doing, we offer how datafied and digitalised forms of knowledge and practice are thoroughly shaping teachers, ontologically and epistemically.

Theorising datafication: (re)defining bodies and language

The classical age discovered the body as object and target of power. It is easy enough to find signs of the attention then paid to the body – to the body that is manipulated, shaped, trained, which obeys, responds, becomes skilful and increases its forces. (Foucault, 1977: 136)

For the purposes of this paper, we focus on three separate but linked dimensions of the T-TESS evaluation system – (i) datafied *bodies*, (ii) datafied *infrastructures* and (iii)

datafied *language* – that provide significant sites where discipline and control are exercised through hybrid accountability and interoperable language. These sites require material and discursive techniques to synchronise and make compatible the digital and material spaces within which teachers are judged. Teachers' physical behaviours that are subject to judgment (e.g. engagement with students and lesson design) must be prepared for *digital capture*, or the expression of material matters in digital form, in which these judgments are then digitally stored and analysed. For example, a teacher's physical performance might be measured via an evaluation rubric and then be documented on a data management system as a series of digital data points.

We refer to this process as digital capture, adding to Zuboff's (2019) use of 'rendition' to theorise how human experience is translated into a datafied version that is amenable to digital collection and analysis. She draws on the diverse meaning of the word, in terms of (i) how something is intentionally converted from one form to another; as well as (ii) to deliver or surrender something, often in an obliging way, as in the invocation to 'render unto Caesar' in the Gospel of Saint Matthew (see Zuboff, 2019: 234). We add to this the equally polysemic term 'capture' to include the process of (i) arresting a moment in time and (ii) documenting and fixing it on a digital platform. As both a digital platform and a set of physical processes, T-TESS uses language, practices and tools to render, capture and judge teacher performance. In doing so, it creates interoperability and compatibility between the digital and physical, thus fundamentally changing how, when and to what ends teachers are known and governed.

From the teacher's body...

One of the most significant sites implicated in the datafication of education is that of the body. There are many types of 'body' that can be thought about here: *human bodies*, such as those of students and teachers; *professional bodies*, such as professional teacher organisations and teacher regulatory bodies; and *bodies of data*, the evidence generated, collected and curated about students, teachers and schools. For the purposes of this paper, we are particularly interested in how datafication has increasingly (although not exclusively) shifted the site of surveillance and control from human bodies to bodies of data.

With digital technologies that enable the constant collection and observation of countless forms of data, the inspectorial gaze is cast upon both human and data forms of bodies to define, predict and respond to schooling matters. As many have argued, teachers and students have been subjected to, and subjects of, increasingly ubiquitous modes of quantification, evaluation and comparison, and it continues to be a central feature of schooling systems across countries to this day (Lingard, 2013; Grek, et al., 2021). With stated aims that include, for example, improving

standards, quality and effectiveness of school performance or elevating what some consider the professionalism of teachers, accountability has served as a notional solution to a myriad of intractable, or 'wicked', social problems (see Head, 2019; Rittel and Webber, 1973). Although the technical elements of accountability might look different across contexts, the logics that underpin such systems and discourses are strikingly similar, with modes of surveillance, examination and comparison used to incentivise teachers and students to perform in desirable ways. Within each of these technologies, the physical body of the teacher in the physical space of the classroom is the primary site of inspection and discipline.

Drawing on Foucault's concepts of governmentality, technologies of the self, panopticism and normalisation (to name but a few), scholars have compellingly illustrated how techniques of test-based accountability have disciplined teachers. Teachers have been drilled to compete against themselves and their colleagues, comply with standards and performative demands and adopt a spirit of continuous growth (Holloway, 2019; Perryman et al., 2017; Wilkins, 2011). In all these processes, the teacher's body serves as the site of surveillance and, importantly, the site of intervention. Under threats of inspection, demotion and public shame, the teacher is then compelled to perform as a particular kind of teacher who sees metrics, competition and data-driven dispositions as valuable (and necessary) characteristics of 'good' teaching (Holloway, 2019; Lewis and Holloway, 2019; Thompson and Cook, 2014).

Global trends in teacher surveillance and appraisal, such as open-door policies, formal observations of lessons and regular one-on-one conferences between appraisers and teachers locate the teacher's body as the primary exposure site of accountability. However, a teacher's thoughts are also no longer free from observation, and the need to submit lesson plans and self-assessments is only some of the ways that teachers' opinions and beliefs become objects of inspection, rendering teachers' inner deliberations about their practice and sense of self visible and appraisable. Through these material practices, teachers (like prisoners in Foucault's panopticon) are made into 'docile bodies', who behave and act in ways deemed appropriate and desirable (see Perryman, 2006; Wilkins, 2011). The teachers' practice is transformed, for sure, but so too are their bodies, minds and souls (see Ball, 2003; Foucault, 1977).

... To bodies of data

Although disciplinary approaches continue to be central mechanisms for steering schools, teachers and students, the environment has also been thoroughly (re)shaped by digital technologies and logics that produce entirely new conditions and possibilities. Within the digital milieu, as the teacher's body continues to be a site of inspection and discipline, so too does the teacher's *body of data* – captured,

analysed, observed and acted upon within the digital domain – create a new site for the inspectoral gaze. We employ the term *data infrastructures* here to describe the socio-technical assemblages (i.e. people and computing hardware/software) that laboriously translate human activity into data, which are then able to be collected, stored, visualised and mediated between otherwise disparate, diverse and disconnected actors and spaces (e.g. schools, districts, states, systems). This changes not only how schooling is practised but also, and perhaps more fundamentally, how knowledge is produced about schools and teachers (Clutterbuck, 2022; Clutterbuck et al., 2021; Hartong and Förschler, 2019).

As various parts of accountability systems migrate to digital platforms and their attending data infrastructures, new possibilities have emerged regarding how and to what end school subjects are monitored and governed (see also Langman, 2021; Manokha, 2018). Indeed, the digital storage and reporting of student and teacher data have created exponential growth in the categories of judgement that can be captured within schools and classrooms. Rather than the teacher being the sole object of surveillance and intervention, these same corporeal bodies are now tracked and measured to amass digital bodies of data, which shifts the inspectoral gaze solely from classrooms to also encompass online algorithmic predictions, outputs and comparisons (see Thompson and Cook, 2014). Although it might be tempting to view these *data-proxies* (Smith, 2016) as true representations of human bodies, the datafied body is instead fabricated through the data techniques and technologies available in a given context.

Sometimes referred to as *dataveillance* or *liquid surveillance* (Bauman and Lyon, 2013), digital platforms help create new spaces, relations and possibilities for inspection, auditing, appraisal and intervention. Although teachers have been subject to metrics and observation for decades, the digital shift means that teachers' data can now be observed more often, by more people and from remote locations. For example, while the observation of teacher practice previously required someone to be physically present in a classroom, teacher's data that are stored electronically on digital platforms can be observed by anyone with an authorised access code (e.g. principals, curriculum coaches, district leaders and state leaders). At the same time, techniques are required for capturing and rendering teacher behaviour in a manner that can be read and understood by the digital platform. Such techniques and (inter)actions help to produce and, increasingly, normalise new datafied spaces of measurement and governance (Hartong, 2018; Lewis, 2020; Lewis and Hartong, 2022; Williamson, 2017), which Gulson and Sellar (2019: 350) argue has brought about 'changing relations of power and space in education'. This reflects the enhanced imbrication of the social and technical characters of digital infrastructures, where standardising languages and expectations around data help to bridge the

distance between the technical and the human, which in turn makes teacher practice legible for digital capture. We thus see data infrastructures as constituting schooling spaces (i.e. ontologically), as well as defining the types of knowledge, expertise and discourses that are valued and authorised within such spaces (i.e. epistemically).

As we will show with T-TESS, the symbiotic relationship between the physical and virtual relies on prescribed language that *sits between* the bodies (i.e. physical and data) and performs a synchronising role. Here, teachers' practice must be expressed through the prescribed language so that their behaviours can be captured via prescribed tools and rendered digitally in the T-TESS platform. Just as two platforms require interoperable language to speak to one another (see also Gulson and Sellar, 2019), so too do teachers' physical bodies and bodies of data require a similar interoperability. This interoperable language permits mutual understanding between the physical and digital, thus enabling teacher bodies and practice to be mutually governed through discipline and control.

Contextualising T-TESS and teacher accountability in Texas

Texas has a long and contentious history with accountability systems that rely on calculative and evaluative techniques, including large-scale standardised assessments and predictive analytics for setting performance targets and measuring growth. Over the years, various types of high-stakes consequences have been associated with these accountability systems, such as teachers being terminated for failing to add enough value to their students' test scores (Amrein-Beardsley and Collins, 2012). Their current teacher evaluation system, which is an amalgamation of various accountability techniques and tools from previous systems, is called the *Texas Teacher Evaluation and Support System*, or T-TESS. According to the Texas Education Agency, T-TESS:

... strives to capture the holistic nature of teaching – the idea that a *constant feedback loop* exists between teachers and students, and gauging the effectiveness of teachers requires a consistent focus on how students respond to their teacher's instructional practices. (teachfortexas.org, n.d.; emphasis added)

This comprehensive, state-level framework is not only an evaluation process but also a digital platform (<https://www.teachfortexas.org>), where data are stored, collected for analysis and reported back to teachers and school leaders.

As such, we refer to T-TESS as a *hybrid accountability system* that operates as a policy framework, appraisal protocol and online data management system. In addition to data collection and reporting, the platform also provides a suite of resources related to the T-TESS evaluation process, including

training videos, observation rubrics, evaluation templates and procedure handbooks. All of these components share the common language and philosophy of T-TESS and are explicitly aligned with the Texas Teacher Standards. Although high-stakes teacher appraisal is far from new in Texas, T-TESS itself is unique in that (i) it has been authorised through a state-wide mandate, (ii) its main features and tools were designed almost entirely by external agencies, and (iii) T-TESS operates as a hybrid system, with physical and digital components working simultaneously.

Altogether, T-TESS functions as a form of dataveillance that generates and collates various data points on each individual teacher, including self-tracking data, testing data and appraiser-collected data. Such an approach is consistent with other forms of datafication that have been documented elsewhere (Bradbury 2019; Bradbury and Roberts-Holmes 2017; Lupton and Williamson 2017), but T-TESS is distinct because of its hybridity. Indeed, T-TESS relies both on digital modes of datafication that focus the disciplinary gaze on the teacher's data (e.g. value-added measures, self-tracking, digital recordings of observation data), as well as more conventional modes of observation and evaluation that focus on the teacher's physical body (e.g. in/formal observations, targeted professional development). In our view, T-TESS demonstrates what other datafication scholars have emphasised that discipline and control work together and recursively in education spaces. With T-TESS, discipline is not transitioning *to* control. Rather, physical spaces, behaviours and subjects are known via the digital (e.g. algorithmic calculations, data visualisations, etc), which is made possible by disciplining teachers' physical language and behaviours to be rendered as digital data and captured electronically.

Thus, while T-TESS includes data collection, analysis and reporting as key features of shaping teacher behaviour and subjectivities, we are equally interested in the physical materials that make such rendering and capturing processes possible. These include written standards, rubrics, training handbooks, video modules and other materials that train and calibrate teachers to speak and act in T-TESS-operable ways. This is the interoperable language that enables the compatibility between the physical and digital dimensions of T-TESS. For teachers' subjectivities to be shaped by various datafication techniques that extend beyond testing data, their language and practice must also be rendered legible to both the language and philosophy of T-TESS. This legibility is cultivated from an early stage – sometimes starting in teacher preparation programs where T-TESS is used in pedagogical and evaluative ways – and then reinforced at each stage of a teacher's work in the Texas system (e.g. training, evaluation and professional development).

Analytical approach

We did not approach this collaboration in what might be described as a conventionally empirical way, where

theoretical frameworks provide researchers with an analytical heuristic to answer pre-formed questions. Instead, we drew on empirical material as the basis for 'thinking with theory'. This approach reflects what Jackson and Mazzei (2013: 262) describe as 'methodology-against-interpretivism', which 'disrupts the centering compulsion of traditional qualitative research; ... [it] is about cutting into the centre, opening it up to see what newness might be incited'. Adopting this appeal to think with theory saw us engage in extensive and lengthy conversations that continually unfolded over the course of multiple years. During these conversations, we alternatively 'plugged in' our data to different theorists' concepts, including, but not limited to, Michel Foucault, Gilles Deleuze and Shoshana Zuboff, imagining hypothetical debates between the theorists to argue the respective merits (or otherwise) of their concepts. We then rearranged our data, our interpretations and arguments based on the theoretical tools deployed and challenged each other on our own interpretations and assumptions. It was messy and entangling, to be sure, but also thoughtful and generative, and such a conceptual mess was arguably necessary to conceptualise and investigate the emerging transdisciplinary policy problems posed by T-TESS.

Throughout this iterative process, we found Foucault's (1977) concept of discipline and Deleuze's (1992) concept of control to be especially productive for understanding how T-TESS governs schooling by acting on both the (physical) bodies of teachers (via discipline) and the (virtual) bodies of data (via control). Based on our engagement with the literature, we initially understood control to be a more linear development from discipline, whereby control was overlaid upon earlier disciplinary techniques of governance. However, this proved inadequate to explain what we encountered in T-TESS, which instead suggested that discipline and control were not only occurring at the same time but were able to work simultaneously because of codified languages and physical–digital hybridity. Rather than seeing discipline and control as distinct frameworks that each provided insights into a unique domain of T-TESS, we instead sought to produce new theoretical opportunities by thinking with theory to emphasise the imbrication and, arguably, symbiosis between the different domains of T-TESS. Here, we assert the primacy of interoperable language and physical–digital hybridity to understanding new forms of datafication. As we intend to show, the case of T-TESS demonstrates how language and digital data are each integral to the other, theoretically and empirically, meaning that datafication scholarship should be alert to how digital and linguistic produce and enable the other. For now, the 'assemblage of our thinking' (Jackson and Mazzei, 2013: 264) has produced what we hope is a new way of thinking about datafication, school accountability and teachers.

Turning to our empirical materials, we collected and analysed all publicly available resources associated with the T-TESS platform and evaluation process between January 2019 and February 2022. This included implementation guides, appraiser training materials, appraiser templates, observation rubrics, rubric training module videos, reports associated with external partners (e.g. reports produced by the analytic software company, SAS), and partner websites. In considering these materials, our thinking was guided by three primary questions: (i) what are the key features of the T-TESS platform and how does it operate; (ii) what are the key stages of the T-TESS evaluation process and how do they use the T-TESS materials and technologies; and (iii) how are these practices and materials fed back to shape teachers' practice and being? In addressing these questions, we came to see T-TESS as both a disciplinary language and a process for alignment, whereby the material sources (e.g. rubrics, standards) provide the readable code, and the various T-TESS procedures (e.g. goal-setting meetings, targeted professional development) calibrate and correct teachers' language and behaviour so they can be rendered legible to the T-TESS system. Through a series of corrective operations, these teachers are then translated into T-TESS teachers who embody, speak and practise the elements of the T-TESS language and philosophy. Ultimately, this primes them to being 'readable' as points of data that can be acted upon and improved.

Having outlined our theoretical and analytical approach, we will now consider how the different domains of T-TESS operate collectively to govern teacher behaviour and practice.

The hybridity and interoperability of T-TESS

Surveillance of bodies, practice and thinking

In Texas, teachers have been subjected to observation for several decades and T-TESS only continues this long tradition. In this section, we refer specifically to discrete, physical forms of observation (e.g. a principal observing a teacher in the classroom), which is a central requirement of T-TESS. The first stage of physical observation is the initial goal-setting meeting between a teacher and their appraiser. These meetings are held at the beginning of each school year and are designed to establish a clear plan for the teacher to follow for the remainder of the year. According to the *Teacher Goal-Setting and Professional Development (GSPD) Plan Sample Document*, 'teacher self-assessment, goal setting and professional development are all interwoven and applied throughout the year to positively impact each teacher's professional practices and ultimately increase student performance' (Texas Education Agency, 2022a: 1).

During the goal-setting process, the teacher is required to designate one dimension of the T-TESS rubric to serve as the basis of their goal; for instance, *Domain 2, Instruction;*

Dimension 4: Differentiation (Texas Education Agency, 2022d: 17). The teacher then works with a school-based appraiser to (i) develop a specific plan for how they will attain this goal and (ii) determine what forms of evidence will provide proof of successful attainment. Prior to the meeting, appraisers are provided with specific T-TESS guidelines and a template for how to facilitate the goal-setting process. Teachers are also required to complete a goal-setting and professional development template that is reviewed by the appraiser before, during and after the goals have been established, implemented and measured.

The following vignette developed from a T-TESS goal-setting training video (see *Professional Growth and Self-Reflection* at <https://www.teachfortexas.org/Views/Resources>) illustrates how the platform sets the parameters for what can be stated as classroom 'problems' and 'solutions' during the goal-setting procedure (see Bacchi, 2000). Importantly, this vignette highlights how the language of T-TESS is crucial for disciplining teachers' thinking and practice, and we will discuss later how this disciplining serves as the basis for rendering and capturing teaching in digital forms. For context, the vignette is based on our analytical notes from reviewing the T-TESS handbook, website, training videos and rubrics:

Teachers are provided training videos and materials to learn about the stages and expectations of T-TESS, including how the goal-setting stage should transpire. One video is of a teacher and her appraiser meeting to establish the teacher's initial goal and professional development plan. During the meeting, the teacher explains that she is interested in 'really hitting both extremes of my classroom [i.e. low- and high-performing students] in all levels of the curriculum'. However, the appraiser quickly corrects the teacher's comments and encourages her to use the T-TESS term 'enrichment', which prompts the teacher to modify her language accordingly. After a series of corrections, the teacher eventually establishes 'differentiation' as her goal, which corresponds to Domain 2: Dimension 4 (Instruction: Differentiation: 'The teacher differentiates instruction, aligning methods and techniques to diverse student needs'). (Texas Education Agency, 2022c: 13)

In Table 1, we provide an extended excerpt developed from this goal-setting training video, which consists of the teacher's remarks about the goal she would like to set for herself, the appraiser's interpretation and translation of the teacher's comments, and the specific T-TESS materials from which their language originates. Of particular importance are the subtle ways in which the appraiser corrects the teacher's language to correspond explicitly with T-TESS, which we have emboldened.

The correction of errors signals an important way that teachers are disciplined to think, speak and act in terms of T-TESS. We argue this accomplishes three things: (i) it

Table 1. Translating teacher behaviour, language and practice to T-TESS.

Teacher's comments	Appraiser's translation	Reference to the Rubric
<p>Well, I was actually thinking of focusing on differentiation and really hitting both extremes of my classroom, in all levels of the curriculum. So, I know that's been a struggle in the past, so I really want to focus in on that.</p> <p>So, you've got students who might struggle from time to time with concepts, and then students who might need enrichment in those concepts?... So, thinking about this goal of differentiating for all your students, how do you think that a goal like that might positively impact student achievement in your classroom?</p>	<p><i>Teacher Goal-Setting and Professional Development (GSPD) Plan:</i> 'The goals should reflect how the teacher will change his/her practices to effectively impact student outcomes'.</p>	<p><i>Instruction Dimension 2.4: Differentiation:</i> 'Always provides differentiated instructional methods and content to ensure students have the opportunity to master what is being taught'.</p>
<p>Well, for the enrichment part, I don't want to give them just extensions that give them long projects to do because it's not a time thing. It's more of a depth issue. So, I really want to give them something not necessarily longer, but just something to really get them to dig in deeper.... Especially connecting it – or integrating the curriculum with another...</p>	<p>Okay. So, you're recognising the – so it's important to you that your students who are getting it and their enrichment experiences aren't long, drawn-out projects necessarily, but really help students understand concepts to a deeper level....</p> <p>Okay. So, you want kids to make connections? ...Between different subjects?</p>	<p><i>Instruction Dimension 2.3: Communication:</i> 'Asks questions at the creative, evaluative and/or analysis levels that require a deeper learning and broader understanding of the objective of the lesson'.</p> <p><i>Instruction Dimension 2.2: Content Knowledge and Expertise:</i> 'Integrates learning objectives with other disciplines, content areas and real-world experience'.</p>
<p>I want to make sure that they are definitely at least going to get the two or three essential questions that I need out of the work... Well, I've tried like the GT [gifted and talented] menus, for example, and those just have given them a lot of options in the past So maybe just focusing in on less options, but deeper connections within the options. And then maybe for the other side of it, just more guiding questions in my lesson plans ahead of time, so that I know that's where – that's where I'm heading, so that's where the student should head with the assignment given.</p> <p>So, with the students who need enrichment, you really – you might – you're thinking about possibly limiting the choices for their kind of menus?</p>	<p>So, they're going to choose the activities that allow them to go deeper, but you're going to pre-select some activities that will allow them to make connections with other subjects?</p> <p>Okay. And then for your students who might be struggling at that time, you're going to identify essential questions before the lesson as a way to focus your instruction and check for mastery? Is that right? Or are you thinking of something else?</p> <p><i>Teacher Goal-Setting and Professional Development (GSPD) Plan:</i></p>	<p>'Evidence of formative and summative assessments aligned to learner outcomes, data results used to inform practices, and correlational data to measure the effectiveness of assessments and mastery of learner outcomes'.</p> <p><i>Instruction Dimension 2.2: Content Knowledge and Expertise:</i> 'Consistently anticipates possible student misunderstandings and proactively develops teaching techniques to mitigate concerns'.</p>
<p>I want to focus in on – I mean, <i>let's hit all of them</i> [essential questions] if there's time, but the problem is sometimes you just can't help it, and <i>I want to make sure those essential ones, at least</i></p>	<p>Sure. So, I would identify the high-impact questions ahead of time, and I would make those visible for students....</p> <p>So that you can – because I know you refer to the objective regularly in your instruction. And as you refer to that objective, you can also frame the questions that way. So, you can say something like, students, by the end of our lesson, you're going to be able to compare these two historical figures and how they contributed to Texas history, or something like that. And you're also</p>	<p><i>Instruction Dimension 2.5: Monitor and Adjust:</i> 'Uses discreet and explicit checks for understanding through questioning and academic feedback.'</p>

(continued)

Table 1. Continued

Teacher's comments	Appraiser's translation	Reference to the Rubric
	gonna [sic] be able to answer these two questions, and you'll have those questions visible for students.... And then that can even provide some opportunities to check for understanding throughout the lesson.	

renders teachers' behaviour and practice in a manner that is legible for examination; (ii) it provides the techniques for teachers to engage in self-examination and discipline; and (iii) it allows for the teacher's practice to be captured (or *capturable*) for digital purposes.

Calibrating language for interoperability

As alluded to above, the 'proper' use of T-TESS language and behaviour is fundamental to the fidelity of the system. As described in the *Guidance on student growth in T-TESS* (Texas Education Agency, 2022b: 1), the main purpose of the program is to:

- Create a shared understanding and *common language* across campus and district to *describe* effective pedagogy;
- Increase the frequency and quality of collaborative and coaching *conversations* between teachers and their appraisers;
- Strengthen habits of reflection, self-assessment and adjustment on the part of teachers; and
- Strategically sequence development opportunities for teachers. (emphasis added)

During the goal-setting and professional development meeting, the appraiser is ideally positioned to help calibrate the teacher's language and aspirational goals to the language of T-TESS. Using prescribed T-TESS templates and extensive training, the appraiser can detect any errors in the teacher's linguistic syntax – or ideas that will not correspond with the T-TESS framework – and then translate the teacher's intended goals into the correct T-TESS verbiage. These translations are necessary to create a clear alignment between the physical and virtual spaces, with the appraiser acting as the mediator between the teacher and the T-TESS rubric.

The T-TESS rubric consists of four distinct domains (*Planning, Instruction, Learning Environment, Professional Practices and Responsibilities*), which are each then broken down into 3–5 separate dimensions per domain (Texas Education Agency, 2022d: 17). Each dimension includes descriptors for five distinct performance levels, ranked in descending order from *Distinguished, Accomplished, Proficient, Developing* and *Improvement Needed*.

Like the appraiser mediating the language between the teacher and the rubric, the rubric coordinates the linguistic with digital codes (see Figure 1), sitting between the physical and digital spaces.

The figure above shows an example of *Domain 1, Dimension 1 (Planning, Standards and Alignment)*. After providing evidence of their performance, which must come from a pre-approved list, the teacher is assigned one of the performance levels. This designation is what is entered on the T-TESS platform in digital format. Here, the T-TESS rubric serves as the central mechanism for establishing the shared language for the teachers, their appraisers and the digital platform.

As mentioned previously, the rubrics also provide the framework for goal-setting and professional development agendas, and they are also used in some Texas teacher education programs. The training videos available to teachers on the T-TESS platform describe each rubric domain and dimension in detail, as well as offer specific examples of how teachers can best target the dimensions and indicators in their lessons. Thus, the linguistic-digital translation process allows for the rendering and capturing of teachers and teaching by creating a single way of defining teacher performance and practice. This in turn structures not only teachers' current practice but also their future aspirations and goals.

Another set of training videos (also aligned to the rubrics) is called 'calibration videos'. These are recordings of real-life lessons that allow teachers and appraisers to practise scoring lessons with a T-TESS *Observation Evidence Sheet*. They can then assess their evaluation abilities by comparing their appraisal scores to the 'correctly' scored evidence sheets that accompany each video, as well as the provided list of 'acceptable' evidence for each of the respective dimensions and proficiency levels. Importantly, each of these calibration videos and training resources is aligned in terms of language and consistency around 'what counts' as evidence for demonstrating certain skills. According to the T-TESS *Implementation Guidebook*:

... *sources of evidence* include teacher input, observations, instructional documents, and student outcomes. *Strategies for gathering evidence* from these sources include conferences before and after lessons, strategic scripting during the direct observation of teaching, and the collection of instructional

PLANNING DIMENSION 1.1 Standards and Alignment	
LINGUISTIC CODE <i>This side of the rubric is expressed linguistically</i>	DIGITAL CODE <i>This side of the rubric provides the corresponding code that can be expressed digitally (i.e., 0 or 1)</i>
Instructional Planning Includes: <ul style="list-style-type: none"> • All rigorous and measurable goals aligned to state content standards. • All activities, materials and assessments that: <ul style="list-style-type: none"> ○ are logically sequenced ○ are relevant to students' prior understanding and real-world applications ○ integrate and reinforce concepts from other disciplines ○ provide appropriate time for student work, student reflection, lesson and lesson closure ○ are vertically aligned to state standards ○ are appropriate for diverse learners • Objectives aligned and logically sequenced to the lesson's goal, providing relevant and enriching extensions of the lesson. • Integration of technology to enhance mastery of goal(s). 	Distinguished
Instructional Planning Includes: <ul style="list-style-type: none"> • All goals aligned to state content standards. • All activities, materials and assessments that: <ul style="list-style-type: none"> ○ are relevant to students ○ provide appropriate time for lesson and lesson closure ○ fit into the broader unit and course objectives ○ are appropriate for diverse learners • All objectives aligned to the lesson's goal. • Integration of technology when applicable. 	Proficient
Instructional Planning Includes: <ul style="list-style-type: none"> • Few goals aligned to state content standards. • Few activities, materials and assessments that: <ul style="list-style-type: none"> ○ are sequenced ○ rarely provide time for lesson and lesson closure • Lessons where few objectives are aligned and sequenced to the lesson's goal. 	Needs Improvement
Ensuring interoperability in T-TESS between linguistic and digital code	
Adopted from the T-TESS rubric (Texas Education Agency, 2022d).	

Figure 1. Ensuring interoperability in T-TESS between linguistic and digital code. Adopted from the T-TESS rubric (Texas Education Agency, 2022d).

artefacts, including student work.... *Artefacts* are documents, records, objects and other items that provide evidence of the impact of instructional and professional practices. Artefacts may also be items that result from student learning and are essential for teachers to demonstrate proficiency in all four

domains and correlating dimensions. (Texas Education Agency, 2022d: 26; emphasis added)

To ensure that T-TESS both reflects and structures every aspect of Texas schools, teachers and appraisers are also

provided with various templates to conduct learning activities, including one-on-one coaching, professional reflection and professional development. The *Teacher Handbook* and *Appraiser Handbook* also provide specific prompting questions for guiding each stage of the T-TESS process.

Securing interoperability through ongoing appraisal and correction

After the teacher has established an approved goal and a related professional development plan, the T-TESS evaluation cycle is then set into motion. This stage of T-TESS, which occurs multiple times a year, includes a pre-conference, in-class observations and a post-conference. Like the initial goal-setting process, the evaluation cycle is an all-encompassing procedure that strictly conforms to the T-TESS framework and language conventions. Before the cycle begins, the appraisers and teachers are trained on the pre-defined set of teaching domains and dimensions (the T-TESS rubric), as well as the relevant scoring practices. Appraisal training is accomplished via in-person sessions and online modules and videos, where appraisers learn how to collect data and ‘correctly’ score lessons using the observation rubric. Prospective appraisers must first pass a certification exam that assesses their ability to evaluate lessons in accordance with designated ‘correct’ scores. As mentioned previously, the T-TESS platform offers ten ‘calibration videos’ and ‘correct’ scoring sheets for teachers and appraisers to enhance their own scoring knowledge and abilities. It is important to note that these calibration videos and respective ‘correct’ scoring sheets were developed by an external agency – the National Institute for Excellence in Teaching (NIET) – that has worked extensively with Texas schools in the past.

Like the evaluation training, the actual evaluation cycle is also highly prescribed. Beginning with an initial pre-observation conference that is held a few days before the formal observation, which is designed to assess the teacher’s ability to plan (i.e. from Domain 1 of the T-TESS rubric), the teacher and appraiser both use T-TESS templates and rubrics to structure their meeting. The conference templates stipulate what types of questions the appraiser should ask the teacher and what types of evidence the teacher should draw upon to demonstrate proficiency in the given T-TESS domains. Drawing directly from the *T-TESS Appraiser Sample Conferencing Questions*, some examples of these appraiser questions include:

- What opportunities do you provide for students to set individual goals and hold each other accountable for meeting those goals?
- What are some strategies for involving students in leading and managing responsibilities within the classroom? (Texas Education Agency, 2022c: 87)

The formal observation and its accompanied post-conference follow similarly guided procedures, insofar as the teacher and appraiser are extensively trained on how to perform during the event. Rubrics, templates and video modules are used to guide and evaluate these sessions. If teachers wish to seek additional support, the T-TESS platform offers eight videos that specifically target the various dimensions of ‘Instruction’ and ‘Learning Environment’ (Domains 2 and 3 of the T-TESS rubric). Also available are four videos related to ‘Professional Practices and Responsibilities’, which are assessed during the post-conference and other ongoing assessment activities throughout the year.

We draw attention here to how the entire evaluation cycle is designed to align teachers and teaching with the ideals, expectations and language of T-TESS, with this carefully achieved through extensive training and constant refinement. Supporting this process, the appraiser serves a vital technical role by helping to translate the teacher’s reflections, goals and practices into the language of T-TESS, with this common language providing a lens through which teaching can then be both diagnosed and treated. Furthermore, each step of the evaluation cycle is collected and stored on the T-TESS portal, providing ‘real-time reports used to inform evaluation results and practices’ (Texas Education Agency, 2022d: 33). This is the site where the teacher’s body is rendered and captured as a ‘*body of data*’, that is, where the corporeal human body is transposed into an incorporeal body of data to be observed, analysed and acted upon remotely by both teachers and appraisers.

Bodies of data

Emphasising the pre-eminence of digital data in the evaluation process, T-TESS also seeks to correct for any potential human error introduced into its processes by using statistical tools to measure teachers’ impact on their students’ standardised test scores. The third stage of T-TESS involves measuring teacher performance using value-added modelling (VAM). VAMs are statistical tools that predict how a student should perform in the future, which is then measured against how a student *actually* performs (i.e. the score they receive on a standardised test). This comparative metric is attributed to the student’s teacher to determine how much ‘value-add’ the teacher contributed to the predicted versus actual growth. That is, after controlling for students’ previous achievement scores, VAMs predict levels of expected growth and then compare these to the ‘actual’ levels of growth, with this outcome serving as a proxy of the teacher’s level of ‘effectiveness’. This measure represents the level of ‘value’ (the ‘growth measure’) that the teacher has added to (or subtracted from) their students’ academic growth (see Amrein-Beardsley 2014 for a comprehensive explanation of VAMs). The following school year, teachers receive value-added and diagnostic reports that display statistics

related to the students' predicted and actual growth outcomes, as well as standard errors and teachers' effectiveness levels.

Like rubrics, VAMs are designed to translate teacher performance into a quantifiable, measurable and readily comparable unit. Given the sophistication of VAM measurement, most Texas schools outsource this process to the analytic software company, SAS Inc., where statisticians calculate VAM scores and produce data reports for teachers and schools. These reports include various indicators of comparison (e.g. predicted vs. actual growth; teacher A vs. teacher B, etc.). As stated in the *Guidance on Student Growth in T-TESS* (Texas Education Agency, 2022a: 2), 'the key to a meaningful experience with student growth measures is the ability to translate the student growth outcomes into feedback on pedagogical practices'. These numerical indicators are then used in teacher appraisal meetings to inform future practice and goals. Ultimately, these scores are combined with other sources of data (e.g. rubric scores assessed by human appraisers) to calculate a teacher's overall evaluation score and merit-based pay allowance. It should be noted that VAMs have received a great deal of criticism in terms of their technical limitations (e.g. problems associated with validity, reliability and bias), as well as the negative consequences stemming from their use in teacher evaluation policies (e.g. narrowing of the curriculum and teaching to the test, see, for example, Amrein-Beardsley 2014; Berliner 2018). In Texas specifically, VAMs have been a contentious issue that has been taken up in policy debates and the courts (Amrein-Beardsley and Collins, 2012). Nonetheless, T-TESS includes VAM as a central element of teacher evaluation.

Feeding T-TESS back to teachers

The T-TESS platform and portal (see <https://www.teachfortexas.org/Account/Login.aspx>) serve as the central point for teacher evaluation, observation and professional development in Texas schools. On the one hand, this site is where teachers and appraisers can access their respective T-TESS materials, including handbooks and rubrics, as well as training videos about what kinds of activities address the rubric domains and indicators. On the other hand, the site also serves as a central repository that collects and stores data about teacher performance for later observation and analysis. As described in the *T-TESS Implementation Guidebook*, the portal serves as an:

... on-demand resource that features *powerful data reporting tools* and provides *real-time reports* used to inform evaluation results and practices based on the submission of both *formal and informal observation data* over the course of the year. This *cumulative data* includes entry and reporting fields at the teacher, appraiser, and system levels. The system generates *multiple reports* that are

used to analyse the strengths and needs of the evaluation process and guide decision-making at the district, campus, and department levels, including inter-rater alignment and professional development connections. *Teacher reports* are available to communicate overall averages by rubric dimension, teacher performance levels (distinguished, accomplished, proficient, developing, improvement needed), reinforcement goals, refinement goals, and others. *Numerous reports* are also available at the appraiser and organisational levels to express overall averages by observer, school, subject, and other data elements... The evaluation management software provides an *at-a-glance awareness* of current performance at varying levels of the organisation. (Texas Education Agency, 2022d: 33; emphasis added)

This excerpt illustrates quite vividly not only the 'data-veillance' experienced by teachers (Bradbury, 2019; Lupton and Williamson, 2017) but also where teachers are meant to go for data feedback to inform their practice and make adjustments accordingly. This includes, for example, student test scores (e.g. those on standardised literacy and numeracy tests), VAM scores, observation rubric scores and the like. The portal is also where teachers list their professional goals so that appraisers can see in 'real time' whether a teacher is making expected progress. Appraisers' data are also collected and made available on the portal, as this is where they are themselves certified through examination, and where they document when they observe, evaluate and coach teachers.

As noted in the excerpt from the *Implementation Guidebook* above, this myriad of data can be accessed by teachers and school and district leaders. Importantly, this subjects the teachers' body of data (rather than simply the teachers themselves) to a constant digital gaze and judgement, including by the teachers themselves. Simultaneously, these data are fed back to teachers to continue the work of syncing the physical and digital spaces. In this way, T-TESS serves as the physical-digital hybrid, in which the teacher's physical body and their body of data operate in perfect harmony.

The person and the platform: The multiple dimensions of governing through datafication

As we have shown, T-TESS and its physical and digital components – including the T-TESS rubrics, templates and training videos – provide, first and foremost, a monistic language for talking and thinking about 'good' teaching practice and teacher behaviour. Beyond providing a discursive framework through which to understand teachers and teaching, a central governing logic of T-TESS is that teachers, and teacher appraisers, are required to express themselves in this prescribed and interoperable language to be

capturable by the calculating instruments of T-TESS, be they physical (e.g. rubrics) or digital (e.g. VAMs). For this data capture to occur, teachers are subjected to a series of ‘rendering’ procedures during each component of the T-TESS evaluation process that helps to calibrate and modify their language and behaviours in the interoperable language of T-TESS. This avoids any possible syntax errors between the linguistic expression of physical teacher speech and the digital coding language of T-TESS. Taken collectively, the teacher subject, as well as their speech and practice, can now be readily recognisable to T-TESS and is thus capable of continuous refinement and improvement, or constant modulation (Deleuze, 1992).

Also important, this process of surveillance and improvement casts its judging gaze not only on the material ‘body’ of the teacher but also on the *data* that such bodies produce. Recursively, these ‘bodies of data’, and the metrics and visualisations that animate them, are then fed back into the material spaces (e.g. classrooms) where such knowledge can be acted upon to improve practice. Thus, constant modulation is not only happening in the digital space and on digital bodies (of data) but is also present in the physical space and on the physical bodies (of teachers). From this perspective, discipline and control can be seen to work together symbiotically, in which each depends on the other for the knowledge necessary to operate. This is the hybrid accountability of T-TESS, whereby discipline and control work symbiotically to govern both the physical and the digital expressions of teachers and their teaching.

It is equally apparent that the T-TESS platform and evaluation process is thoroughly suffused by data. This represents a clear evolution of the ubiquitous logic of governance by data and numbers that have come to steer contemporary schooling systems and reflect more algorithmic ways of knowing and governing schooling (see Gulson et al., 2022). However, we would contend there is also something unique about T-TESS, in both design and practice. In an onto-epistemic sense, there are few, if any, moments of a Texas teacher’s existence that *are not* prescribed, calibrated and refined by T-TESS. Within the ‘cradle-to-grave’ nature of the T-TESS regime, in which teachers undergo initial goal setting, ongoing professional development and assessment (via observation rubrics), there are few opportunities, if any, for a teacher to operate *outside of* the permissible discursive terrain. All the while, the system constantly mediates and modulates teacher speech and practice through the data these actions generate, which constrains how alternative renderings of teaching and teachers might possibly emerge.

T-TESS thus provides and is enabled by its defining interoperable language, which makes the physical–virtual hybridity both possible and productive. It shapes what can be known about teachers and teaching (i.e. *epistemology*), as well as what teacher subjectivity can be (and

possibly become) under the T-TESS regime (*ontology*). In this way, the disciplining of teachers’ language has profound effects on teachers’ bodies, both corporeal and digital. What we see here is T-TESS constituting an onto-epistemic regime that both defines and constructs teacher subjectivity and practice (see Holloway, 2019). Even though teachers are, paradoxically, positioned as *users* of the artefacts written in the T-TESS programming language, we would contend that it is the teachers themselves who are ultimately shaped by the language. These forms of rendering and capturing ensure a clear alignment between the human and non-human actors; that is, an alignment *of* the human *to* the non-human. We see such processes as redolent of what Hayles (2012) describes as *technogenesis*, or the coevolution of humans with technology, in which human thinking and machinic data processing remain distinct (i.e. as both physical and virtual, respectively) but are nonetheless thoroughly interconnected and co-adaptive (see also Sellar and Gulson, 2021). We do not see this in a dystopian sense, but rather as an evolution of and necessity for the human and technological to operate coherently.

In a similar manner, Thompson and Sellar (2018: 4) note that ‘the context in which data is given has important effects on its formation and these contexts are [being] changed by computer-based processes’. We would also emphasise that a distinguishing feature of T-TESS, relative to previous teacher evaluation systems, is its imbrication of physical and digital properties. T-TESS relies on digital hardware and software (e.g. computers, iPads, platform data management) to record and analyse a variety of data associated with teacher practice and behaviour. Ultimately, these pieces of information are fed back to the teacher for behavioural refinement or reinforcement, creating a ‘recursive function’ (Neyland 2015) that is wholly self-reliant and self-referential, which diminishes any possible points of exit through non-sanctioned thought, action or speech. This is particularly important for our analysis of T-TESS, as the computer-based mediation of data collection, analysis and feedback operates to synchronise teacher behaviour to the T-TESS system, constituting what we have described as physical–virtual hybridity. It is also at this juncture where the individual is made possible, and where Deleuze’s control society is most readily apparent alongside Foucault’s disciplinary society.

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Notes

- 1 These organisations include but are not limited to: Battelle for Kids, Responsive Learning, SAS EVAAS and the National Institute for Excellence in Teaching (NIET). The groups have varied in terms of their contribution and participation in the development and administration of T-TESS.
- 2 We should note that we are unable to identify how often teachers and appraisers access these videos. Given the data and purpose of this paper, we can only identify what is available on the publicly available T-TESS platform. However, further investigation into the use of these videos by educators would help us understand the extent to which the video library is directly affecting teachers and their practice.

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