Teaching and learning as complex phenomena: Implications for policy and teacher professional identity

> 'One shouldn't complicate things for the pleasure of complicating, but one should also never simplify or pretend to be sure of such simplicity where there is none. If things were simple, word would have gotten around...'
>
> Jacques Derrida (1988, p.119)

Widespread support exists for the view that teaching is a complex task (Schulman, 2004), that learning is a complex, dynamic phenomenon, and that classrooms are 'complex systems' (Hardman, 2010). Systems behaving in complex, emergent ways cannot be successfully 'managed' by rigid, scripted practices, but demand flexibility, responsiveness, and in-situ judgement. However, these dispositions appears only fleetingly, if at all, on professional standards rubrics and statutory descriptors of effective teaching. Discretionary judgement is implied, but rarely emphasised. Drawing on the first author's doctoral study of 'emergent learning' in a primary school classroom, we demonstrate the importance of pre- and in-service teachers developing expert in-the-moment professional judgement to navigate the emergent and complex nature of classroom learning, and argue that professional judgement should enjoy a more prominent, less tacit, position in pre-service ITE and in-service CPD. The chapter briefly describes and presents findings from the doctoral research which focussed on how learning emerges bottom-up through classroom interactions, discusses the implications of this for teachers and concludes by setting an agenda for future research into teachers' experiences of agency and autonomy.

Key words: teacher judgement; autonomy; classroom complexity; agency; professional identity

Introduction

The above quotation from Derrida captures one of the biggest challenges facing school leaders, teachers and education policymakers. Educating people in groups is a complex endeavour, the outcomes of which are always to some extent unpredictable. Pupils are all unique, teachers and head teachers are too and schools themselves are diverse, context-sensitive communities. Teaching and learning have a non-linear, non-mechanistic, stochastic relationship rendering them relationally complex and their outcomes difficult to control. Despite these characteristics of school education however, the authorship, implementation and enactment of education policy has an inescapable 'pretence of simplicity' about it (in which we are all complicit to some extent) which appears, especially to those doing the educating, somewhat out of step with things we know about learning and the challenges of teaching. In short, teaching and learning are complex phenomena, but policy all too often portrays them, and their outcomes, as simple and directly controllable. For teachers, whose daily professional experiences involve managing classroom complexities, such simplifications and the expectations which accompany them can prove detrimental to the development of professional identity and judgement.

This chapter draws on professional experience and recent doctoral research undertaken by the first author (BK) into classroom learning. It explores the complexities inherent in classroom teaching and the professional attributes which complex classroom contexts demand from teachers. It presents and discusses arguments about over-simplifications and reductionist portrayals of teachers' work in education policy which contrast with the experiences of many teachers. The second author (NH) was part of the supervisory team for the study which provides the springboard for this chapter. Together we put forward the proposition that teaching is a good deal more complex than its portrayal in policy typically suggests and discuss some of the consequences this has for teacher professional identity.

The Doctoral Study

The research project, entitled *Complex Adaptive System Behaviours in Small Group interactions: A Year 4 Classroom Case Study of Learning as 'Emergence'* (Knight, 2022) used Complexity Theory as a conceptual framework to explore ways learning emerged through small group activities in a year 4 (8-9 year olds) primary classroom, in England. The study, which received ethical approval from the University, collected mixed methods data. This included video observations analysed using mixed methods social network analysis (MMSNA) (Froehlich et al., 2020), pupil self-reports of learning incidents, pupil interviews and researcher field notes. These were integrated to create four learning narratives; stories which could be told about the learning journeys of small groups of pupils who collaborated on a classroom project over five consecutive days. The learning narratves captured instances of learning, their antecedents and consequences for the small groups and the wider class. Each narrative included a sociograph graphic representation of pupil interactions in a given episode of small group activity, showing types and frequencies of interactions, critical learning incidents in the episode and influential group members (see figures 1 and 2 for examples). Self-reported learning data and extracts from pupils' interview reflections on their learning were integrated to reveal examples of learning emerging bottom-up from the complex interactions between the pupils. Analysis of whole class video episodes contextualised the small group structure and together they showed how pupils move between centralised (teacher-led), decentralised (small group) and distributed (whole class) organisational principles. Interactive (figure 1) and learning incident (figure 2) data were integrated to identify and analyse when and how learning emerged out of pupil interactions. In figure 1 nodes represent pupils and edges represent direction and frequency of their interactions. The relative size of each node llustrates each pupils' influence calculated as 'degree centrality' (Grunspan, Wiggins & Goodreau, 2014) . Nodes with higher incoming than outgoing

utterances are considered more influential. Figure 2 illustrates how observed learning incidents were categorised and documented through the duration of each recorded group work episode. It shows that towards the end of this episode there were three observable learning incidents; one 'potential' meaning that learnng may be about to emerge, one 'tangible' meaning that learning was evident and one 'elaborated' meaning that learning was not only evident, but developed through explanation or discussion. These incidents were then described and analysed using 'thick description' (Geertz, 1973) including transcriptions of dialogue and descriptions of social dynamics and body language. Still images accompanied the written analysis to form vignettes within each learning narrative.

The key findings of the study were:

1. That learning can be described as a complex, 'emergent' phenomenon, materialising bottom-up, at least in part as a consequence of pupil-pupil interactions.
2. That 'emergent' learning appears largely incomplete, contingent and only partially formed. It rarely appears in elaborated or distilled forms without teacher intervention.
3. That environments conducive to 'emergent' learning allow for: the collision of ideas; the distribution of influential (salient) pupils; the articulation of partially formed ideas; shifts between centralised, decentralised and distributed organising structures; pupil autonomy; timely and sensitive teacher intervention.
4. That a complex system framing can encourage classroom researchers to think about and look at learning and teaching in ways traditional approaches do not and assist in identifying characteristics of learning which may be inaccessible to constructivist and technocratic approaches.

The study looked at ways learning emerges bottom-upwards when pupils collaborate in small groups. The findings suggest that interactive learning, which is ubiquitous in primary education in many countries, is a complex affair and that learning surfaces in diverse ways and because of a range of networked influences. This chapter is primarily concerned with the implications of this complexity for teachers, teaching and policy formulation.

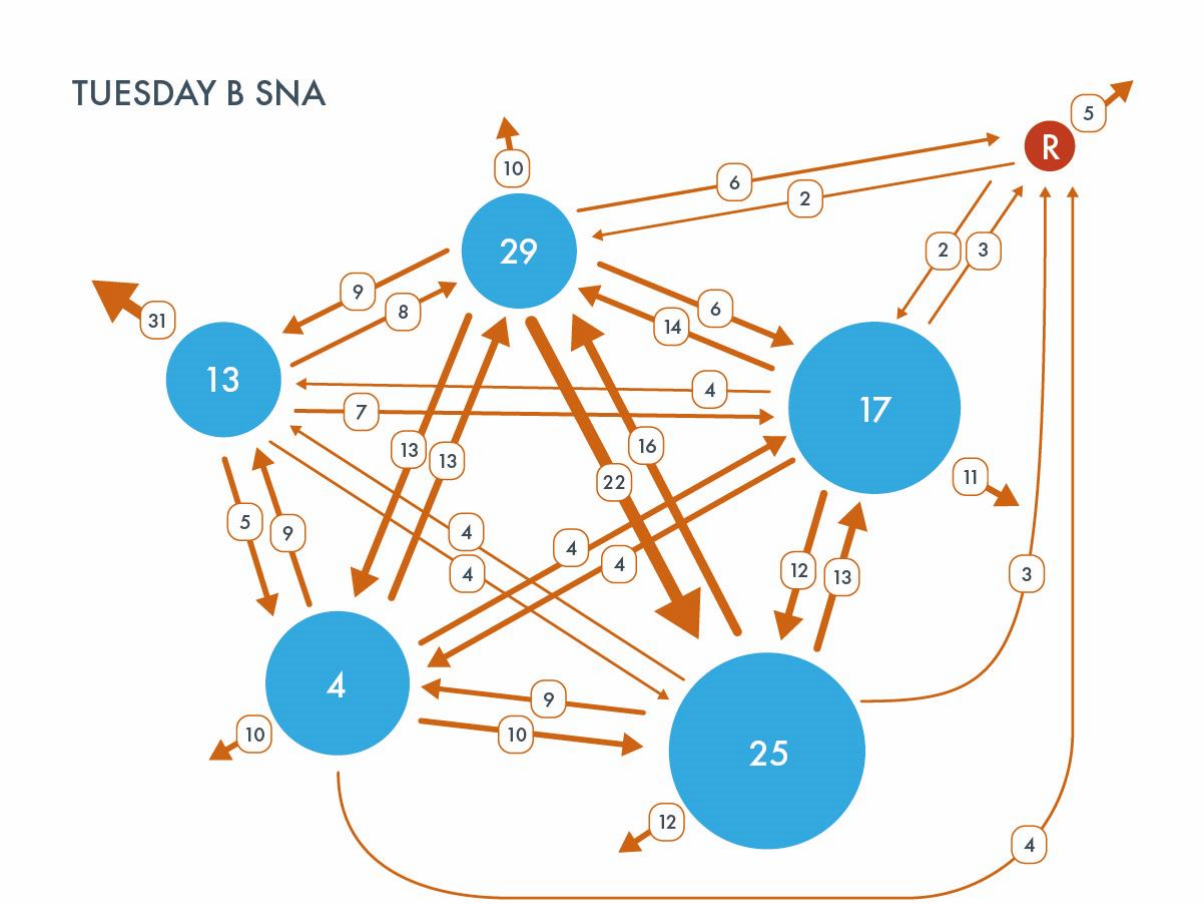

Figure 1. Example of sociograph graphic representation of small group interactions.

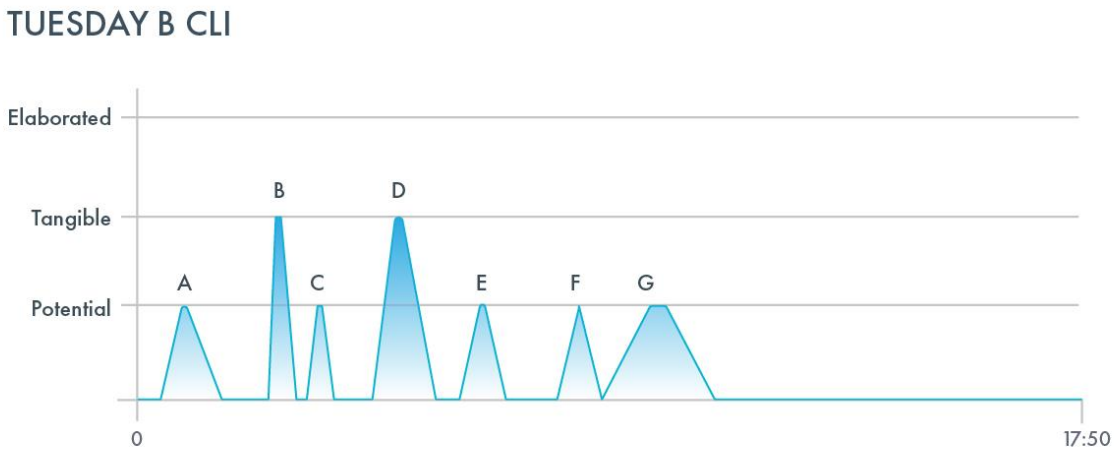

Figure 2. Critical Learning Incident (CLI) graph showing when learning, categorised as Potential, Tangible or Elaborated, was evident during a group work episode.

Teaching and learning as complex phenomena

Arguments that classroom learning and teaching are not straightforward processes are not difficult to locate in the research and professional literature. As Davis and Sumara (2006) point out, any teacher will attest to not being entirely certain about the outcomes of their teaching due to the unpredictability of learners' responses. Eisner (1985:104) described teaching as 'an inordinately complicated affair' and others including Tripp (1993) conceptualise teachers' work in terms of managing uncertainty and problematising changeability. Alexander, Shallert and Reynolds (2009, p.176) point out, 'One cannot begin to understand the true nature of human learning without embracing its interactional complexity.' Shulman (2004, p.504) puts it in categorical terms, 'teaching […] is perhaps the most complex, most challenging, and most demanding, subtle, nuanced and frightening activity that our species ever invented'. The case is also captured succinctly by Schön, who described teachers' work as operating in the 'swampy lowlands' of everyday life. For him,

> '[…] the problems of real-world practice do not present themselves to practitioners as well-formed structures. Indeed, they tend not to present themselves as problems at all but as messy indeterminate situations' (1987, p.4).

Naturally, classroom teaching requires advance planning, known objectives and likely strategies for achieving them, however teaching is not a scripted activity; it could never be due to the inherent complexity, and resulting unpredictability, of learning collectives. Although superficially many classrooms may appear to function with a reasonably high degree of regularity, the interactions of learners' diverse personalities, motivation levels, moods, interests and personal histories, along with variations in home or external factors, including even the weather, will always inject novelty into classroom systems rendering them more indeterminate and contingent than they may appear. Using the analogy of a clock mechanism, Radford (2008) points out that even the most deterministic systems have degrees of unpredictability when viewed at high enough resolution. If one looks closely and for long enough at teaching and learning in any given classroom the complexity of the teacher's work comes into relief.

The learning end of the teaching-learning nexus is no less complex. In any given school cohort 'the persistence of inequities in student achievement' (Sinemma, Aitken, and Meyer, 2017, p.12) speaks to a range of factors influencing variation in learning outcomes. These include inherited and environmental predispositions such as cognitive ability, personality, confidence, task commitment and risk-taking tendencies along with home and school ecosystems. Research from several domains offer insights into learner factors and their effects on learning. For example, Bronfenbrenner's (1979) ecological systems theory presents a framework for describing community and

environmental influences on individuals' development. Research into the emergence of gifts and talents in school age learners (Renzulli, 1986) has highlighted common elements which typically correlate with high performance, including general cognitive ability, environment, personality, self-confidence and chance. Studies from the field of psychology (e.g., Gardiner and Jackson, 2015) illustrate how personality influences learning behaviours and outcomes. Studies of class emotion and mood (Canovi, Kumpulainen and Molinari, 2019) reveal how pupil interactions, on/off-task behaviours and learning can be influenced by interpersonal features including regulation, negotiation and resistance, which all interact with curriculum teaching in complex ways.

In the doctoral study upon which this chapter is based, classroom complexity showed itself in a number of ways. Firstly, it was evident that learning, which remains stubbornly conceived in policy as a matter of teacher transmission (Knight, 2017) has complex, emergent qualities. That is, it surfaces from the bottom up as a result of the collision of ideas and interaction of diverse pupil characteristics. This was seen in the spontaneous patterns of interaction and organisation which arose among pupils, eliciting novel ideas and conditions which occasioned learning. Sometimes these emerged as consequence of pupil conflict, sometimes through discussion and disagreement and sometimes pupils sharing their knowledge and understanding. The study also revealed how the interplay of pupils' personalities and personal dispositions created conditions which both prompted, and prevent, learning. In each case, the various points of difference between the pupils, combined with sufficient autonomy for interactions in small groups, created the space, openness and unpredictability which can both elicit and inhibit learning and which teachers typically have to manage.

Sullivan (2009) has pointed out that changes in classroom behaviours, to routines and to expectations and to pupil learning, are often instigated by teachers, but can also be triggered from within the pupil collective. Even in the most tightly managed classrooms where learning and routine are largely teacher orchestrated, the collective influence of pupil interactions create complexity, generating teaching and learning landscapes where pupils learn partly because of, partly in spite of, and sometimes irrespective of teachers' actions.

Secondly, (and related to the previous point) it was evident that learning shared a stochastic relationship to teaching, or as Doll (1993) put it, learning may be anticipated, but not predicted since teaching is 'ancillary' to learning, 'not causative'. This was evident in the study by the fact that teaching and learning rarely shared spatio-temporal contiguity; i.e., learning rarely appeared on cue during or shortly after teacher input, but often at surprisingly long intervals afterwards. There was also evidence that pupil learning was constructed via a networked array of antecedents and

contexts, including direct instruction, positive and negative group interactions, school and home environments. This was seen across the integrated data sets, from the video observation data which showed how learning was prompted by a diversity of interactive behaviours, from the pupil interview transcripts where references to the origins of learning were common and from the self-report moment of learning data which showed time lapses between learning activities and visible learning emerging. These findings are unlikely to surprise any classroom teacher, used as they are to the daily reality that learning is non-linear and learners construct their understandings gradually, in fits and starts by drawing on multiple sources and resources. However, as the next section explores, despite these lived complexities which teachers manage daily, in policy learning remains stubbornly conceived as a simple product of teaching.

Education policy and the simple view of teaching and learning

If curriculum, professional standards and accountability policies give clues to their authors' perspectives, then whilst these findings may not surprise teachers, they may surprise some policymakers. The doctoral study concluded highlighting that managing classroom complexities to create optimal conditions for the emergence of learning demands sensitivity and judgement about productive levels of pupil autonomy. This requires a good deal of teacher confidence and expertise, including comfort with uncertainty, sensitivity to teachable moments, activation of propositional and procedural knowledge and discretionary judgement. This represents a considerable challenge, even for experienced teachers, and as Burn, Hagger and Mutton (2015, p 14) point out, the challenge for pre-service teachers is even greater,

> *If we are to support beginners effectively, we first need to acknowledge just how complex the task of teaching is. If we do not adequately recognise the challenges involved […] then we will fail to prepare our trainees for the shock of that discovery.*

Since policy guides so much of what happens in schools, classrooms and in teacher education, 'adequately recognising the challenges involved' also requires acknowledging them in policy. In the next section we explore some of the policy frameworks which tend to marginalise, or ignore, the complexities of teaching and learning and position them (albeit indirectly) as straightforward propositions.

A popular portrayal in policy and public discourse present teaching and learning as simple, linear and mechanistic processes, reflecting a technical rationalist view of teaching. In this conception, teachers apply instrumental solutions to address well-formed problems and Schön's *messy, indeterminate*

situations are nowhere to be seen. National agendas in England concerning teaching and learning, pupil progress, curriculum, professional standards and teacher development are typically driven by this input-output conception. In the dominant policy discourse, Ofsted's category of 'Outstanding' teaching is narrowly defined as the meticulous planning of lessons to reliably meet specific, predetermined objectives (Eaude, 2012) and despite years of reform, the language of policy still implies a transmission and absorption model of teaching and learning. We refer to this as the 'simple view'. The simple view of teaching and learning is not articulated explicitly in any single policy, however it hangs invisibly, but uncomfortably, around such concepts as 'best practice' and 'effective teaching' and phrases such as 'pupils should learn that…' and 'teachers must…'.

To illustrate this further, in the principal statutory policy for regulating standards in teaching in England (The Teachers' Standards - DfE, 2021) each of the eight codified expectations are preceded by the phrase 'A teacher must…'. The constituent examples under each standard are dominated by imperative verbs, including 'have', 'demonstrate', 'establish', 'impart', 'use' and 'know'. These language choices, whilst usefully unambiguous, paint a picture of effective teaching as something teachers simply do, or do not do. Conspicuous by their scarcity from this policy are references to reflection (which appears once) or judgement (which does not feature), both of which are central to achieving the aims set out in the standards themselves. Accepting that articulations of expected practice may naturally emphasise outcomes more than processes, we nevertheless argue that the inclusion of process language would characterise teaching more accurately. For example, point three of Standard 7 (DfE, 2021, p.12)

- *Manage classes effectively, using approaches which are appropriate to pupils' needs in order to involve and motivate them.*

Would more closely resemble what is actually required of teachers were it to read:

- *Make judgements about effective ways to manage classes, evaluating and selecting suitable approaches in order to involve and motivate pupils.*

Point one of Standard 5 (DfE, 2021, p.11)

- *Know when and how to differentiate appropriately, using approaches which enable pupils to be taught effectively.*

Could be more accurately expressed:

- *Judge when and how to differentiate appropriately, using approaches which enable pupils to be taught effectively.*

Expressed as it is in the policy, this point sends a clear message to pre-service teachers, teacher educators, existing teachers and their managers that effective practice in this area is simply a matter of 'knowing' (or not knowing) what to do. It also tacitly implies that once a teacher 'knows', that knowledge will be relevant in all contexts. However, by leading with the language of judgement a different message could be signalled about the nature of teaching; that it is a contingent, context-sensitive and complex affair; that effective practice is always a question of reflection and judgement, not possessing (or not possessing) fixed knowledge. In another example, this time from the Early Career Framework (ECF), a policy which articulates continuing professional learning and expectations for teachers in the first few years after qualifying (DfE, 2019), references to teacher reflection and judgement are similarly scarce. Encouragingly, reflection appears twice, however judgement makes no appearances. Likewise, in the Core Content Framework (CCF), the curriculum for initial teacher education (DfE, 2019), whilst it is again encouraging that reflection is mentioned five times, teacher judgement is not mentioned at all. Cordingly et al. (2019) pose a valid question about whether professional standards and competency descriptors promote or restrict teacher autonomy. We argue here that such policies could promote autonomy if the language of autonomy was employed. As can be seen from the examples above, it is not only what *is* said in policy about teaching and learning which may create this simplistic view and restrict teacher autonomy, what *is not* said is also influential.

A similar portrayal of teaching and learning is also mirrored in media and public discourse. Television, online and print media routinely present narratives about school exam results, league tables and 'best' or 'worst' performing schools (Pattinson, 2020), with performance usually cast as solely a function of 'good' or 'poor' teaching (Tait, 2018). This leads to the popular notion that if teaching is 'Outstanding' learning will (or should) be too. The human tendency to seek simple, causal explanations and simple solutions to complex phenomena is well known to complexivists and anthropologists who might argue as Mencken (cited in Ciotti, 1983) does that 'for every complex problem, there is a solution that is simple, obvious, and wrong' (p.37). Journalists too are well aware of the necessity to simplify, which goes some way to explain the reduction of learning to a linear product of teaching in the media. As Levin (2004) points out, 'anything beginning with "This is a complex issue" is likely to result in most people ceasing to pay attention' (p.278). We believe that the combined result is one in which teachers often cannot recognise the realities of their daily work reflected in the policies which govern it or, we speculate, in the wider cultural landscape within which they operate.

Oversimplification of teaching and learning: Implications for teacher identity and development

The reality of the classroom teaching is that teachers are tasked to manage, co-ordinate, choreograph a formidable and diverse assortment of mutually influential factors in the interest of learning. It is problematic if teachers' everyday professional experiences appear at odds with depictions of teaching in public and policy discourse; e.g. to parents, school leaders and in the media. What might be described as the routinising of teaching (Mahony and Hextall, 2000) leads to the view that if teachers would just get it right (or to use the language of the Teachers' Standards 'know' how to do it), pupils would all make desired progress. The concept of 'getting teaching right' is an interesting one. As noted previously, it is rarely expressed explicitly, however the presumption that when learning outcomes are disappointing teaching must have been too (and vice versa), lurks like a residue underneath much of the policy discourse about teaching and learning. Hardman (2015), rightly in our view, describes this as a failure of simple causal explanations to adequately account for the complexities of school and classroom learning. Whilst there is no question that quality and appropriateness of teaching strongly influences learning, to paraphrase Derrida, if things were that simple, we would all know about it by now.

Why does this matter? According to Suarez and McGrath (2022) a key factor influencing the development of teacher professional identity is their collective and individual belief about their practice. This includes beliefs about the nature and expectations of their role, self-efficacy and autonomy. According to the OECD (2020), teacher professional identity is multifaceted, including factors such as the status of the profession, responsibility and autonomy and societal value of the profession. These components speak directly to the challenge discussed in the previous paragraph. If teaching and learning are viewed as simple in policy and societal discourse, and professional competency descriptors expressed as simplified imperatives, it seems less likely that teachers will feel that the complexities of their work are understood and valued in policy or wider society.

A key finding from the doctoral study, evident in the critical learning incident data, was that visible learning emerges infrequently and often only in 'potential' forms (see figure 2). However, as already discussed, the view that teaching causes learning and that effective teaching causes better learning, more frequently hovers tangibly over much education policy and policy discourse. This finding illustrates a potential mismatch between the ways teaching and learning are portrayed in policy and the reality in classrooms, as observed in the first author's doctoral study. There are obvious risks associated with a rift between policy portrayals and teachers' everyday experiences. A study conducted in Cyprus by Karousiou, Hajisoteriou and Angelides (2019) showed that teachers can and do feel threatened by policy which contradicts or appears to undermine their values, experience or

identity. The potential threat posed by the simple view of teaching and learning common to multiple education policies in England is the discouragement to exercise professional judgement, the stifling of professional autonomy and sense of professional mistrust. For teachers there is also the burden of being held publicly accountable for a phenomenon (learning) over which they cannot exercise full control. Hargreaves and Fullan (2012) refer to the sense of being permitted and encouraged to exercise autonomy and judgement as professional capital and note with some disappointment that whilst it appears to thrive in some professions (including medicine, law and social work), it remains elusive in teaching.

A key recommendation from the doctoral study was that since learning is emergent, indeterminate, contingent and characterised by uncertainty then teaching should be flexible, sensitive to classroom conditions and to some extent improvised. Since learning cannot be relied upon to appear for all pupils on cue during or immediately after teaching input, teachers must be both permitted and able to develop and follow their instincts and exercise their judgement in response to learner dispositions and the dynamic nature of classroom environments. They must enjoy sufficient professional capital. Schön's invoking of real-world practice being 'messy and indeterminate' (1987, p 4) offers a descriptive explanation of why this is necessary,

In 'messy indeterminate' classroom situations (daily occurrences in most classrooms) teachers may draw on a variety of resources, including routine (Tripp, 1993) and standardised knowledge (Heilbronn, 2008), but they will also inevitably draw on their own interpretation, their instinct and judgement. This is what Dewey (1960) referred to as 'intelligent action', the ability to act in what Schön (1983) referred to as 'no right answer' circumstances. Complex, unpredictable endeavours (like teaching) in complex, dynamic environments (like classrooms) demand this. Teachers are required to make a multitude of judgements throughout a typical day. These include decisions about instruction and explanation, about timings and pace, about seating plans, the movement of pupils, scaffolding support and the management of behaviour, to name just a few. A teacher's professional identity is determined to some extent by their professional capital, and we argue that to build a healthy and productive identity teachers must see themselves as professionals with both the competence and sufficient latitude to judge what is best.

The 'what works' mindset and the allure of policy simplification.

The simple view of teaching and learning is really just one co-traveller with the broader policy phenomenon often referred to as 'what works' (Biesta, 2007). This is perhaps exemplified by the

creation and prominence of the Educational Endowment Foundation (EEF) as the principal contemporary funder of educational research and its close alignment with policymaking – schools are expected to absorb its findings and implement practices that exemplify them. 'What works' can best be thought of as a mindset, or epistemology in which evidence of impact and effectiveness is prioritised and learning is characterised as discrete, measurable, products. 'What works' seeks concrete and universal answers to questions like *what should teachers do to optimise (individual) learning outcomes?* There is much to praise about approaches to policy which foreground evidence over ideology, unevidenced assumptions or individual perspectives. Davies (2004, p.3), for example, champions a 'what works' approach because it

> *'helps people make well informed decisions about policies, programmes and projects by putting the best available evidence at the heart of policy development and implementation'.*

Sayer (2020) attributes the rise of 'what works' in the 1990s to criticisms that education research lacked the rank and rigour of medical research. Whilst on the face of it building policy initiatives informed by evidence appears infinitely sensible, 'what works' is not without its critics, particularly in the field of education. One obvious necessity when creating evidence-informed public policy is that the evidence in question should be credible, reliable and robust. This is more easily achieved in clinical fields where random controlled trials (RCT) are the norm because controlling biomedical variables is relatively straightforward compared to those in social contexts like education. As a result, Davies' 'best available evidence' is often not as robust or reliable as one might like, a point made by Harrison and McCraig (2017). The many context-sensitive variables which create the complexity we discuss in this chapter make schools and classrooms challenging contexts for RCTs.

'What works' is predicated on certain assumptions. Firstly, that it is actually possible to discover what will work in an abstract and decontextualised way. Secondly, that what might work can be usefully translated into teaching approaches that will result in improved pupil outcomes a high percentage of the time, and with little or no risk of worsened outcomes. Thirdly, that what works in one classroom will permanently work, work in all classrooms and with a compelling proportion of learners. Fourthly, that education practice can be neatly compartmentalised ('what works' for special educational needs and disability (SEND), for teaching reading, or teaching mathematics, or managing behaviour, or preventing radicalisation) without mutual-exclusivity or conflict of interest between practices. Fifthly, that there are valid measures and definitive timescales by which the 'what' can be adjudged to have 'worked', and that any gains are sustained (Pawson, 2013).

Understanding what does and does not work in education relies on our ability to make causal attributions (Koopmans, 2016). The first and second of the above assumptions are at the heart of

the causality simplification issue, and Byrne's (1998) assertion that in the social world, 'outcomes are determined not by single causes but by multiple causes, and these causes may, and usually do, interact in a nonadditive fashion' (p.20) rings true here. This, and similar, submissions from Geyer (2012), among others, suggest that even the idea of discovering 'what works' is an impossibility, since complex social systems, such as schools or the teaching and learning nexus within them, are highly contextual and do not behave in ways conducive to illumination via evidence from RCTs; something that the EEF itself is beginning to appreciate (Edovald and Nevill, 2021).

Identifying teaching practices which research indicates may accelerate pupil learning on average is one thing. To presume such practices will 'work' everywhere, or that they will not actually have a negative effect for some, is probably expecting too much. In explaining why 'what works' doesn't always work, Biesta (2016, p.194) criticises the 'prevalence of quasi-causal thinking about educational practice and its improvement', suggesting that by ignoring the complexities of educational contexts policy makers end up asking the wrong questions and confusing educational improvement with the effectiveness of educational action. A legitimate concern for all invested in improving education is that if we are not naming the challenges accurately enough, or asking the right questions, we have little prospect of meeting them, and that is a problem. As illustrated in earlier examples, the fact that there is no mechanistic causal relationship between teaching and learning (or a magic wand) has not prevented policy from evolving as if there is. Logical extensions of the 'what works' approach include concepts like 'fixing' schools (Lingenfelter, 2015) or 'ensuring' pupil progress. However, the approach of presuming that tweaks to professional standards, curriculum or accountability frameworks will result in wholesale improvements in pupil outcomes is yet to bear significant fruit.

Of course, education policy, especially at national scale, will always be somewhat reductionist and can never portray all the realities of the classroom as teachers experience them. National policy must, to some extent, be presented in terms of causes and effects, the causes mostly being pedagogical enactments and the effects (in theory) being improved outcomes; this is the raison d'etre of national education, after all. Whilst there are cogent arguments in favour of greater devolution of local policy making to schools and greater autonomy for school leaders and teachers, we accept the cause-effect model as a basic reality of centralised national policy making. Inherent in this is a belief that some pedagogic practices *will* be more effective, more of the time, and in more places, than others.

Complexity reduction is inevitable and necessary in large-scale policy making. Simplicity is also a necessity. Humans are hardwired to reduce complex entities and systems into manageable and

digestible forms (Gelman and Kaylish, 2006). The inclination to present educational issues as simple and fixable is as understandable as it is alluring, particularly for politicians, whose longevity and status is built on being perceived to be effective. However, it does come at a cost. When teachers, and those who educate and manage them, adopt the mindset that what 'works' can be handed down nationally in bite-sized chunks rather than discovered locally and historically, the first casualties are likely to be teacher autonomy, reflection and professional judgement; building blocks of professional identity.

Whilst accepting that policy will have a built-in and unavoidable simplicity, we agree with Hardman (2010, p.8) who argues that 'policy makers would do well to recognise the limitations of their insights'. We are not arguing that 'nothing works' or 'everything works', but rather that government and its agencies need to better appreciate contextualised nuances and the value of everyday teacher judgement, with a greater acceptance that classrooms are places where learning emerges and is not purely a linear and unproblematic consequence of teaching defined by reductionist ideas of the 'only right way' of doing things.

We believe that asking teachers to enact policies which appear at odds with their experiences of teaching and learning, or which appear to characterise their work in ways they do not recognise, does little to create a positive, empowered or self-motivated workforce and goes some way to explaining the current recruitment and retention crisis in England (Worth, 2023). Equally, education policy which seems disconnected from realities on the ground in classrooms is also vulnerable to neglect. This is illustrated by data from Karousiou, Hajisoteriou and Angelides (2019) showing that teachers will resist policy initiatives which they perceive to undermine their professional identity. Knight (2017) has argued that there is a need for more accurate depictions of teachers' work and its relationship to pupils' learning. It is our contention in this chapter that inaccurate portrayals of teaching and learning in policy, and the knock-on effects in media and public discourse, may actually discourage teachers from adopting the sorts of professional identity, mindsets and behaviours which may lead to improvements in pupil learning.

Conclusion and ways forward

The doctoral research on which this chapter builds showed that learning is unpredictable, contingent and sensitive to context and local system interactions. A key conclusion from the doctoral study was that learning clearly has emergent qualities, meaning that it can, and often will, emerge bottom-up through autonomous distributed and decentralised pupil interactivity. An implication of this is that

teaching demands what we refer to as 'managed complexity'. This requires teachers to embrace the heterogeneity and involution of classroom teaching and learning, to exercise judgements about what seems best for their pupils in this moment, and hold less tightly to what ought to 'work'. Another conclusion from the study, and something of an elephant in the room, was that because of the emergant and contingent nature of learning, teachers , whilst influential, can only exercise partial control over it. We argue that if this was more widely understood, acknowledged and reflected in teaching and teacher education policies, those policies could more authentically represent teaching as teachers experience it and better prepare novices to manage its complexities. As we have argued above, applying even small tweaks to policy language which move it away from categorical imperatives and implications of simplicity, whilst foregrounding reflection and judgement, would go some way to achieving this.

This matters because portrayals of teaching in policy influence the how it is nurtured in teacher education (Knight, 2023), how it unfolds in the classroom and, crucially, how teachers view their professional work and professional selves. Within the frameworks of curriculum and standards of professional conduct, teachers should be encouraged to view themselves as trusted autonomous agents, expected to, and capable of, making discretionary judgements in the interests of pupil learning. Making judgements, learning from them, adapting them, experiencing them bear fruit and reflecting consciously on one's own growing expertise are key elements of professional development and professional identity formation. Trusted teachers are also self-motivated teachers. Small changes in policy language have the potential to unlock the professional and decisional capital on which professional identity and self-motivation grows, provided the language is backed up by permission to exercise judgement.

Given the recruitment and retention crisis currently unfolding in the teaching profession in England and the fact that the number of new teachers entering the profession barely keeps pace with the numbers leaving it (DfE, 2022), efforts to create professional trust, agency and positive identity among teachers should be a policy priority. This means acknowledging the inherent complexities of learning and teaching to all with a vested interest, but perhaps most importantly teachers themselves. To build on the important observation from Derrida with which the chapter opened, we have been pretending to be sure about the simplicity of learning and teaching for quite long enough. No word has spread about the magic wand producing pupil learning on cue, therefore it is time to acknowledge that teaching is, to repeat Elliot Eisner's words (1985, p.104) 'an inordinately complicated affair', and give teachers the trust and latitude they need to judge how best to navigate that complexity.

To support this we believe further research is necessary into the complexities of classroom teaching and learning. This chapter has drawn on research evidence from a single doctoral study undertaken in one classroom. As such, it offers some initial illustrations of ways learning emerges through pupil interaction, upon which others may build. The study has implications for teaching and teachers but it also highligts the need to develop new insights into teachers' work, the ways in which it shows itself to be far from simple, predictable or scriptable and the ways teachers wrestle with professional autonomy and agency.

Lessons for doctoral students

The principal lesson emerging from this study was that since classrooms, like all social settings, are complex, unpredictable environments with many moving parts classroom research plans must be flexible and researchers must be responsive to changing conditions and be able to adapt in-situ when collecting data. In short, like teachers, researchers must be both permitted to and capable of exercising judgement.

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