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Sustaining professionalism: Teachers as co-enquirers in curriculum design

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Abstract

In England, the development of teachers' curriculum design capabilities has been identified as a 'challenge remaining' (Department for Education [DfE]. (2022). *Opportunity for all: Strong schools with great teachers for your child.* https://www.gov.uk/government/publications/opportunity-for-all-strong-schools-with-great-teachers-for-your-child). A recent White Paper (Department for Education [DfE]. (2022). *Opportunity for all: Strong schools with great teachers for your child.* https://www.gov.uk/government/publications/opportunity-for-all-strong-schools-with-great-teachers-for-your-child) offered access to a publicly funded online platform as a solution. Drawing on Stenhouse's concepts of teachers as researchers and curriculum as an inquiry process, this article argues that such a policy initiative restricts both curriculum and professional development. An alternative approach to curriculum design, one based on Stenhouse's conception of the iterative development of teachers' professional and curriculum knowledge is profiled. In this article, we, as four teacher-researchers, analyse a project which featured the Curriculum Design Coherence (CDC) model. We share insights gained from our involvement, both in relation to our professional learning and the impact of our curriculum design work on our pupils. We argue that the 'othering' of teachers in research contributes towards the under valuing of practice-informed evidence in policy making. We draw on the work of Lawrence Stenhouse to inform a different means of generating educational research

evidence, one that sustains teacher-researchers through engagement with principles and concepts so as to inform policy and curriculum development.

INTRODUCTION

If it is accepted that the object of curriculum development 'is the betterment of schools, through the improvement of teaching and learning' (Stenhouse, 1975, p. 3) then central to this endeavour, lies teachers' professional learning. In this article, we, as four teacher researchers, will suggest that currently in England, a reductive account of teacher's professionalism is being proffered in official documentation and that this has a limiting effect on both the status of the profession and the quality of curriculum design. In order to substantiate these claims, we draw on three key avenues of enquiry, the importance of epistemology within teacher education, the role of systematic knowledge in professional development, and the role of disciplinary knowledge in curriculum design. We examine each theme in turn and argue for a more expansive articulation of teachers' professional knowledge, one which is informed by Stenhouse's insights, such that 'teachers not curriculum packages are the agents of change and that the function of curriculum projects is to surface the professional learning of teachers' (Rudduck, 1988, p.32). It is by drawing on a curriculum design project, summarised in Table 1, that we exemplify our argument. We reflect on our research experiences to offer a discrete case study (Yin, 2018), one that is aspiring to be 'generative rather than representational' (Martin & Kamberelis, 2013: 677). Our small-scale project was funded by a British Curriculum Forum Investigation Grant (2022–23) and focused on developing sequences of learning in relation to education for sustainability in Key Stage 2 geography. We acknowledge the limitations of our work in that the project took place across one academic year and involved just four classes.

The full project report, available via the BERA website (Author, 2023) shares our work as colleagues who were eager to explore how a curriculum design framework, the Curriculum Design Coherence (CDC) model (Rata, 2019, 2020, 2021) (Figure 1) could contribute towards enhancing both teachers' and pupils' knowledges.

The CDC model consists of four connected elements (Figure 1), each of which supports teachers in drawing differently on selected disciplinary concepts. Concepts are used as the mechanism to enable curriculum design coherence. Concepts are a form of knowledge that have different properties to experiential, propositional and procedural knowledge. Concepts provide learners with access to knowledge that coheres and connects otherwise seemingly disparate learning experiences, by providing 'an essential foundation for understanding and a structure through which students can develop other types of knowledge' (OECD, 2019, n.p.). During the project we developed for ourselves a shared articulation of some of the key terms referenced by the CDC model (see Table 2).

Professor Elizabeth Rata, the originator of the CDC model, contends that there is a 'direct connection between…logically structured knowledge and the development of a logically organised mind' (Rata, 2020, p. 31). Such a claim led us to want to explore the connections between a teacher's 'logically organised mind' and those of their pupils. We began to wonder about which professional resources we drew on to help us to 'logically structure' our curriculum design solutions. We quickly recognised that as a group of experienced colleagues, we had been exposed to theories that helped us to evaluate how pupils

TABLE 1 Project summary.

Project dates	Main activities	Impact on teacher knowledge	Impact on pupil knowledge
November–December 2022	Literature review in relation to forms and types of knowledge, professional learning and education for sustainability	We recognised that we needed a theory of knowledge and agreed definitions for the project in relation to the different forms and types of knowledge that we draw on in the curriculum design process	We began to consider whether we could investigate connections between our curriculum design process and pupils' achievements. We recognised that this is a 'big claim' to associate with a small project.
January 2023	Generate three research questions	• What is meant by the term 'curriculum design and why might this be a significant capability for teachers to develop? • What is the relationship between teachers' curriculum design knowledge and pupil progress?	• What might primary geography contribute towards developing pupils' knowledge and understanding of the concept of sustainability?
February 2023	Explore the CDC model	We recognised that teachers need to appreciate the disciplines key concepts, and use these to specialise and organise the specific content and contexts that pupils are exposed to. Concepts are examples of a discipline's systematic knowledge. For example, place, scale, environment, interconnection, location, diversity.	To build 'powerful knowledge' (Young, 2008) the learner needs to be able to move from concrete context to an abstract understanding. Fragmented content without conceptual connections, which specialise and organise specific exemplification is incoherent, limiting progression.
March 2023	Create our proposition statements to inform our curriculum design plans for coherence. e.g. water use is affected by location; Food production is diverse	We created our proposition statements. These refer to the subject's key concepts that have been prioritised. The connection of the concept(s) to the content and context makes our curriculum intentions specific.	We recognised that previously we would focus on the activities that we want the pupils to do (atomised know how or know that statements) rather than also being conscious of how to structure pupil's access to the transferable meaning and understanding that we were ambitious for them to develop.

(Continues)

TABLE 1 (Continued)

| Project dates	Main activities	Impact on teacher knowledge	Impact on pupil knowledge
April 2023	Peer reviewed our sequences of learning	We checked in with each other to explore the logic of our reasoning for the selection of our concepts, contexts, and content. The collaborative nature of this activity, informed by a theory of knowledge enabled us to be more objective and less subjective in our evaluations of our work. We could be systematically analytical rather than imposing our individual own priorities. We had a shared language to use.	We were more conscious of what and why we wanted to prioritise for our learners in relation to national and local curricula and our curriculum responsibilities in terms of wider society, i.e. why specific concepts, content and contexts are significant for our pupils to know and understand.
May–June 2023	We each taught our sequences of 3–6 lessons informed by the CDC model to our classes. We each visited one other project teacher in their setting and spoke with their pupils and benefitted from an online 'check in' meeting.	We noticed that we were far more intentional in our teaching, linking otherwise fragmented content to the specialising and organising concepts. This intentionality was dependent on the effortful work that we undertook prior to planning our lessons. Without the curriculum design work, we would not have been conscious of the specialising and organising power of disciplinary concepts.	Our pupils were asked to create pre and post mind maps to share their understanding of sustainability. We are mindful of making claims that the nature of our project cannot support, however we feel that we have evidence to indicate that the more conscious use of concepts by us as teachers has enabled pupils to develop a deeper understanding of the concept of sustainability.
June 2024	Project evaluation day. A full day and we were joined by an external evaluator.	We distilled some of our key learning from the project which has led to this article and our advocacy for access to systematic knowledge to be part of professional learning in curriculum design.	We evaluated the pupils' concept maps, some of these are shared in the full project report (Author, 2023 pp. 18–25) to explore the progression in their understanding.
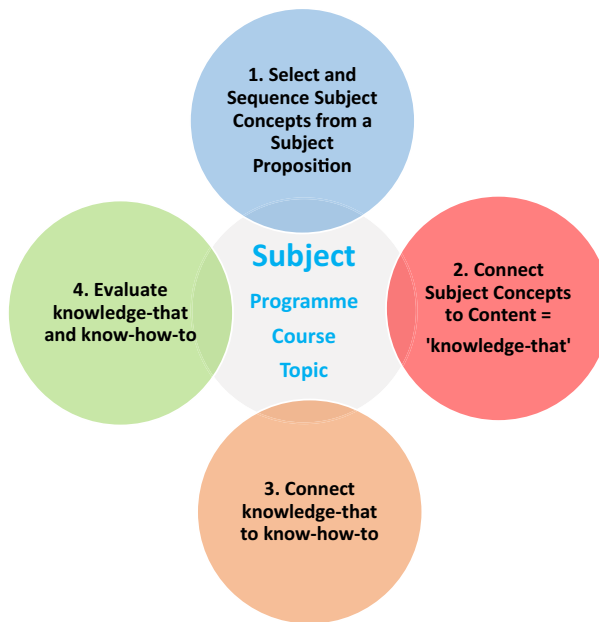
FIGURE 1   The four elements of the curriculum design coherence model (Rata, 2021).

TABLE 2   Project terms.

Term	Meaning
Coherence	The logical connection between differentiated forms of knowledge which results in justifiable and well-reasoned relationships being made. Such logical relations deepen understanding and enable progression.
Concepts	The key organising ideas for a subject discipline. These provide the purpose to any sequence of teaching.
Content	The specific knowledge and skills that are to be foregrounded in a sequence of teaching.
Context	The motivational example that has been employed to engage pupils with the content. The context will determine the content and will be informed by the organising concepts that have been selected to drive the teaching.
Curriculum design	A specific component in professional practice which connects a subject's epistemic structure to pupils' cognitive structure. Learning results from the connection. The connection is possible because logical arrangements exist in both structures – in the knowledge and the mind. (Rata, 2020)
Discipline	A branch of knowledge as systematised into distinct way of enquiring, knowing, exploring, creating, explaining and sense-making.

learn (e.g. Vygotsky (1962), Sweller and Chandler (1991)). We had also benefitted from insights surrounding approaches to assessment (Black and Wiliam (2009), Harrison and Howard (2009)) but that in terms of curriculum design, we had not been exposed to theories of knowledge that would help us to meaningfully and systematically evaluate the success of our endeavours. Our initial review of the literature suggested that we were not alone in recognising this concern.

Whilst our project took place in primary schools in England, colleagues in New Zealand, where the CDC model originated, have acknowledged that without recourse to a theory of knowledge, then teachers are likely to 'flounder in an experiential space rather than one enhanced by the presence of conceptual knowledge' (McPhail, 2016, p. 1157). Similarly a lack of professional knowledge about curricular concepts has been an issue for teachers in Scotland (Priestley et al., 2015) where curricula reforms have arguably given teachers intellectual freedoms but without an associated investment in the development of their curriculum design capabilities (Humes & Priestley, 2021). A lack of knowledge about curriculum design has also been a concern within the Netherlands (Nieveen & van der Hoeven, 2011) and more recently in Wales where there has been an ambitious raft of curriculum reforms and a realisation that a lack of 'professional knowledge about curriculum design concepts continues to impact on implementation' (Sinnema et al., 2020 p. 186). We were therefore attracted to the CDC model as it gave us access to the scholarship that had informed its particular conception of the curriculum design process, in addition to the framework itself.

THE IMPORTANCE OF EPISTEMOLOGY WITHIN TEACHER EDUCATION

It has been argued that a 'key feature of good curriculum design is the ability to manage the different types of knowledge in a sequence that matches not just the needs of the subject, but also that of the student' (Winch, 2013, p. 128). On our first project day together, we quickly realised that our prior experiences of curriculum development had focused on the needs of the student, and the development of learning activities, the 'pedagogic imperative' (Pountney, 2020); and that we remained intellectually innocent of the needs of the subject. We also recognised that we were restricted by our conceptions of knowledge. We could talk of knowledge as 'know that' knowledge and skills (know how), but that was the limit of our appreciation. However our engagement with the project led us to comprehend that there were different types of knowledge that could (and should) serve different purposes in the curriculum design process. We acknowledged that it is 'the muddled language of "subjects", "skills" and "knowledge" which confounds sensible curriculum debate' (Alexander, 2010, p. 7). We began to realise that there was much to gain from an enhanced appreciation of epistemology. The CDC model helped us to distinguish between concepts, knowledge by acquaintance (experiences) propositional knowledge (know-that) and procedural (know how) knowledge. In addition we were introduced to the significance of 'intelligent know how' (Winch, 2013), or 'know how to' knowledge (Rata, 2021) in which the conceptual purpose specialises and organises an otherwise seemingly atomised moments of action or recall.

The CDC model itself is based on a realist epistemology. A key proposition of realism is that the product of thought (Popper, 1981) can be distinguished from the process of thought (Vygotsky, 1962). Over time, in disciplinary fields, concepts exist independently of the person(s) who originally thought them, they become enduring ideas shared across time and space and communities of scholarship, who test and refine and continually contribute to them. The cohering role of concepts is realised when others are given access to such thought products. A concept is an object of thought and so has 'real' effects in that it can specialise, organise and cohere experiences. Indeed it 'is the social reality of unobservable concepts that gives them power relative to our common-sense concepts and enables them to transcend the specific instances and circumstances of everyday life' (Young, 2008, p.43). Concepts have arguably been under appreciated in curriculum design.

It is by accessing concepts that the process of objectification and generalisability can be unlocked. A learner can generalise from concepts. It is not possible for them to generalise from a list of content or skills alone. The ability to generalise represents the means 'to

connect the material and immaterial, the known and the unknown, the thinkable and the unthinkable, the here and the not here, the specific and the general, and the past, present and future' (Wheelahan, 2007, p. 2).

Through the project, it became clear to us that if engagement with disciplinary concepts was important for our learners, then it was also important for ourselves. We began to recognise two distinct and important themes. First, we were gaining insights in relation to curriculum design principles for our pupils and second, we were beginning to think about how our own teacher education curriculum could be designed to enable us to better access the systematic and organising concepts that discern and cohere our profession. Such concepts make explicit the distinguishing principles, to which, we, as public professionals who teach, are accountable. We suggest that this realisation was enabled as we had engaged with the underpinning theory and not just the content realised in the CDC model. We recognised that if teachers are to have epistemic agency it is vital that we engage with education's disciplinary concepts, the systematic knowledge that informs the curriculum design process.

THE ROLE OF SYSTEMATIC KNOWLEDGE IN PROFESSIONAL DEVELOPMENT

Systematic knowledge is taken to mean, knowledge that takes professionals beyond the contexts of individualised experiences by providing access to the enduring (but not fixed) forms of knowledge that specialise, organise and hold to account the distinctive nature of the profession. Such knowledge has powers of abstraction that enable knowledge-building through evaluation and connection across different times and spaces. Systematic knowledge therefore 'constitutes a "disturbance" to an individual's subjective ways of understanding the world as they acquire the means to think objectively and, perhaps most significantly, to be critical of the social order in order to improve it' (Rata et al., 2019, p. 164). Systematic knowledge is transformative, in that individuals can both reach for, and contribute to a shared intellectual resource that informs their professional reasoning and judgement capabilities.

In the introductory sections to both the Core Content Framework (Department for Education [DfE], 2019a) which underpins initial teacher education and the Early Career Framework (Department for Education [DfE], 2019b) which informs the continuing education of teachers in their first 2 years of practice, five core areas are referred to. These could encapsulate systematic knowledge and include behaviour management, pedagogy, curriculum, assessment and professional behaviours. Whilst these are named, they are not utilised in the documentation as forms of conceptual or systematic knowledges that can usefully frame professional learning in a principled way. Somewhat disconcertingly reference to these five areas has been omitted from the revised combined document that replaces both these frameworks (Department for Education [DfE], 2024). Rather, each area is atomised into a series of 'learn that' and 'learn how to' statements that dislocate performative outcomes from the principles that have the capacity to cohere professional understandings. Consequently it is argued that these frameworks offer reductive forms of professional knowledge as they provide 'restricted opportunities for the transfer of learning' (Stenhouse, 1975, p. 35). We argue that in order to benefit from a professionally transformative approach to curriculum design, teachers need to be sustained through their engagement with systematic knowledge, including epistemology and pedagogy, both these aspects are lacking from official frameworks (Department for Education [DfE], 2019a, 2019b, 2024), and from the Teachers' Standards (Department for Education [DfE], 2011).

THE ROLE OF DISCIPLINARY KNOWLEDGE IN CURRICULUM DESIGN

In order to offer a redress to such a lack of access to systematic knowledge, our project drew on the CDC as a process model. We acknowledge that a process approach is effortful as it 'rests of the quality of the teachers. This is also its greatest strength' (Stenhouse, 1975, p. 96). This strength, we argue can only be acquired if we 'shun the offer of ready solutions' and are 'concerned with the painstaking examination of possibilities and problems' (Stenhouse, 1975, p. 122). We were attracted to the CDC model as we were ambitious to facilitate deep learning for our pupils, 'the ability to see the connections between epistemic parts and wholes of a subject which in turn leads to the ability to generalise by applying abstract concepts to a range of contexts' (McPhail et al., 2023 p. 4). We were all determined that our curriculum design solutions should 'give students the epistemic tools they need to gain access to the social and natural worlds, and to participate in debates about what our society should be like' (Wheelahan, 2023, p. 89).

Our project took place over an academic year and positioned us as teacher-researchers or co-researchers, recognising that curriculum work involves a 'highly dynamic process of interpretation, mediation, negotiation and translation across multiple layers or sites of educational systems' (Priestley et al., 2021, p. 1). We were motivated to explore the oft quoted phrase that the 'curriculum is the progression model' (Spielman, 2018, n.p.) in the context of primary geography. We noted that Ofsted's research review stated that when considering the curriculum as the progression model, what pupils are to know needs to be identified precisely and sequenced clearly (Office for Standards in Education, Children's Services and Skills [Ofsted], 2021, p. 23). We felt that the CDC model had much to offer us in this regard.

Whilst the CDC model (Figure 1), initially offered us an idealised design framework, teacher research projects such as ours can contribute not only towards the model's constant refinement but also to making explicit the nature of the professional work involved in curriculum design. As Stenhouse acknowledged, teachers need to be 'critics of work in curriculum, not docile agents' (Stenhouse, 1975, p. 75). We were therefore able to make contributions in relation to further discerning the differences between designing, making, delivering and evaluating curriculum solutions.

The project was the first time that we had been asked to grapple with discerning between different forms of knowledge and their potential educative value. This led us to question why curriculum design, as a distinctive set of capabilities was absent from official frameworks and why, what was present instead, was the promotion of a national body that will provide 'consistent example[s] of quality lessons and curricula' (DfE, 2022, p. 27).

DISCERNING CURRICULUM DESIGN CAPABILITIES

As a consequence of our involvement in the project we will argue that designing the curriculum requires knowledge that is different to, although connected with the making of lessons, and that by substituting one with the other, the teaching of techniques rather than the development of professional reasoning capabilities is prioritised. Both are needed in a scholarly profession (Kuhlee & Winch, 2017). The development of techniques therefore forms an essential part of a professional education but not its entirety (Winch, 2013). One key reason that training in techniques is insufficient as professional practice knowledge is because it restricts access to systematic knowledge.

Lesson planning is a specific activity which references learning materials and particular lesson objectives achievable within a short period (Lambert & Morgan, 2010). There is therefore an important distinction between lesson planning and curriculum making. The

latter has been recognised as 'a signature part of a teacher's identity. In essence it requires teachers to hold in balance three interrelated priorities, the needs, prior knowledge and experiences of students, the nature and purpose of the discipline plus an understanding and performative craft of technique' (Lambert & Biddulph, 2015, p. 217).

Whilst much has been written about curriculum making (Lambert & Biddulph, 2015; Priestley & Philippou, 2018; Priestley & Xenofontos, 2020), less has been contributed in relation to curriculum design (Rata, 2021; Winch, 2013). As a consequence of the teacher-research enabled through the project we would like to add weight to the need to discern between curriculum making, which includes pedagogy, and curriculum design, which includes an engagement with disciplinary concepts and epistemology. For us, curriculum design relates to curriculum making, but precedes it. Curriculum making relates to lesson planning, but precedes it. This, we argue is an original contribution from our project. Each of these three capabilities (curriculum design, curriculum making and lesson planning) will have an iterative impact on the other, but each needs to be appreciated for the differences that they bring to our understanding of curriculum.

The DfE's white paper (Department for Education [DfE], 2022) claimed that 'the curriculum our children experience is richer, deeper and wider in knowledge than ever' (Department for Education [DfE], 2022, p. 3). Yet an independent review (Office for Standards in Education, Children's Services and Skills [Ofsted], 2023) of professional learning acknowledged that whilst schools 'have prioritised training and development around the curriculum…in around half the schools visited, it was clear that the staff's understanding of planning and designing a curriculum remained limited (Office for Standards in Education, Children's Services and Skills [Ofsted], 2023, n.p.). We argue that these limitations are as a direct result of conflations in official documentation between curriculum design, curriculum making and lesson planning. Consequently, articulations of the distinctive nature of each are omitted.

WHY THE LACK OF CURRICULUM DESIGN KNOWLEDGE IN PROFESSIONAL LEARNING?

We then began to wonder why a focus on curriculum design and epistemology is absent from the Teachers' Standards (DfE, 2011) and from the recent frameworks (Department for Education [DfE], 2019a, 2019b, 2024), particularly as these frameworks claim to be based on the 'best available educational research' (Department for Education [DfE], 2019a). The Department for Education (DfE) however do not make available the criteria that they used to define 'best'. This has led to a particular concern that education reforms in England represent 'a clear case of a political ideology influencing the curriculum as written, taught and experienced' (Parker & Leat, 2021, p. 167). What is absent, is the research from practitioners, those immersed in day to day practices, such as ourselves. Participating in the research project has therefore not only enabled us to think about our own teacher education in relation to curriculum design but also opened up a space for us to critically consider the relationship between the evidence used to inform policy and to sustain our own professionalism.

A recent white paper (Department for Education [DfE], 2022) identified the development of teachers' curriculum design capabilities as a 'challenge remaining' with the solution proffered being one that prioritised engagement with a 'new arms-length national curriculum body' (Department for Education [DfE], 2022, p. 27). One of the stated ambitions for this organisation is to reduce workload 'so teachers can concentrate on delivering lessons, creating new resources, only when there's a reason to do so' (Department for Education [DfE], 2022, p. 27). We argue that this solution tackles the wrong problem. Whilst the reduction of workload is often cited as a justification for the provision of pre-published curriculum solutions and lesson plans, recent insights have suggested that it is not simply the amount

of work, but the type of work that teachers engage with that affect a professional's ability to sustain their endeavours. Teachers' lack of epistemic agency and autonomy have been cited as factors in their decision to leave teaching (Perryman & Calvert, 2020). Nurturing the intellectual elements of teachers' professionalism is therefore an important aspect of developing the status of the profession.

The research evidence used to justify the development of a new curriculum body rather than empowering teachers' epistemic agency is based in what has been termed 'econometric based analysis' (Tatto, 2021, p. 7). These are often large-scale research projects based on results from standardised tests to draw conclusions about teacher effectiveness and 'are playing a consequential role in making high stakes decisions' (Tatto, 2021, p. 7). Such research is typically based on 'a linear processual epistemic basis that is represented by the belief that doing A will lead to B and then C etc.' (Evans, 2023, p. 4). In a similar vein the research chiefly referenced in the Core Content Framework (DfE, 2019a) has been critiqued for being predominately drawn from a 'scientistic' model of educational research (Hordern & Brooks, 2023a, 2023b). Such research eschews engagement with the educative complexities that we found to be so productive in our own research endeavours.

We therefore wish to draw on our own experiences as teacher researcher to argue that as a profession we should be more concerned with understanding 'how evidence is made, how evidence is put to use and how evidence is made to matter' (Lancaster & Rhodes, 2022, p. 160). This work will then enable us to better evaluate 'what policy events do and whether or not these effects are desirable' (Lancaster & Rhodes, 2022, p. 160).

In England official documents recognise that 'it is crucial that every school has a well-designed and well-sequenced curriculum which ensures children build knowledge' (DfE, 2022, p. 25). It is also acknowledged that curriculum design is 'an expert skill, yet too many teachers reinvent the wheel and design new lessons' (DfE, 2022, p. 50). Having engaged with the CDC model, we would want to agree, absolutely that curriculum design is an expert skill, and that all teachers have much to gain by spending time grappling with knowledge about knowledge in order to develop their curriculum design capabilities. Whilst this is effortful work, we found it to be professionally nurturing. We contend that when curriculum design is discussed in official documentation, there is little reference to teacher knowledge, the focus is on pupils. As significant as this is, without the articulation of teacher knowledge, the development of such professional capabilities become under-appreciated, under resourced and consequently under developed, enabling the presentation of curriculum design as a policy problem to be solved, rather than as a professional knowledge dilemma to be addressed.

We acknowledge that we would not have gained the same insights if we had simply been asked to align ourselves with curriculum solutions designed by others. As such in the promotion of pre-prepared materials it 'seems odd to attempt to minimise the use of the most expensive resource in the school' (Stenhouse, 1975, p. 25).

Stenhouse was ambitious to 'change the relationship between educational theory, educational research and teachers, placing teachers at the heart of the curriculum process' (Elliot & Norris, 2012, preface). Our research project is illustrative of one way of realising such an ambition. Our engagement with the CDC model assisted us in clarifying why our access to systematic is significant. If we are denied such opportunities then we suggest that injustices result in terms of our roles as public professionals with a social responsibility in relation to knowledge.

CURRICULUM DESIGN AND EPISTEMIC INJUSTICES

Fricker (2007) argues that there is a 'distinctively epistemic type of injustice, in which someone is wronged specifically in their capacity as a knower' (preface). This can relate to the

denial of epistemic access and/or the lack of a framework to assess the epistemic quality of engagement. We wish to suggest that both forms of injustice are evident currently within the development of teachers' curriculum design knowledge. In relation to epistemic access, we argue that insufficient attention is paid to the significance of systematic knowledge, and in connection with the quality of engagement we suggest that there is a lack of infrastructure to support the coherent development of teacher researcher opportunities. Both forms of epistemic injustices have consequences for our professional status and for the education of our pupils.

Our work as co-researchers has suggested that systematic knowledge needs to be accessed by teachers so that they can justify or give reasons for the judgements that they make in relation to curriculum design. Judgements involve the evaluation of reasons, and the ability to reason has previously be recognised by sociologists of education as being one of the key characteristics of professionalism (Young & Muller, 2014). In order to design the curriculum, teachers need access to theoretical insights, as analytical tools which share a language to explore both curriculum intention and their realisations. For Stenhouse (1975, 1981), the curriculum is not simply a list of content, but rather it is an object to stimulate inquiry. It is a resource from which propositions can be investigated for the impact that they have on classroom practices. In order for such reasoning to be non-arbitrary, it must involve a commitment to a set of collective principles that connect or cohere segments of practices.

We gained professional agency by being accountable to a set of professional principles. Teachers' agency identified as a key component of teachers' professionalism (Fullan & Hargreaves, 2012). Indeed the Chartered College of teaching recognise that: 'Teachers should be able to give a coherent justification for their practices citing (i) evidence, (ii) pedagogical principle and (iii) educational aim, rather than offering the unsafe defence of compliance with what others expect. Anything else is educationally unsound' (Peacock, 2021, p. 8). We would echo this insight. We were grateful for the grant funding that enabled our work. Without this, it is hard to think of any current mechanisms that would have enabled us to come together from a variety of multi-academy trusts and across two local authorities. A lack of an infrastructure which shares and supports teachers as researchers is an issue in England where 'teacher inspired curriculum development is as rare as a desert oasis' (Parker & Leat, 2021, p. 151). As a consequence 'very little policy impact or innovation has emerged out of the work of teachers' (Loughran & Menter, 2019, p. 219). We think that this matters and that Stenhouse was prescient when he stated that 'curriculum development should be handled as curriculum research' (Stenhouse, 1975, p. 120).

TEACHERS AND RESEARCH ENGAGEMENT

Currently the research and evidence that is principally used to inform the official professional frameworks tends to be positioned as being translational rather than being professionally transformative. They are translational in the sense that the evidence base is presented as existing outside of our practice and so needs to be brought in. The evidence base is 'othered' (Lancaster & Rhodes, 2022) from our every-day practices. Such a translational approach 'sometimes regards teachers as theoretically innocent' (Stenhouse, 1981, p. 110) sustaining a theory/practice divide and under appreciating the co-constructive nature of the field. Through our project we enabled a transformative approach, predicated on the ambition that 'ideas should encounter the discipline of practice and practice should be principled by ideas' (Stenhouse, 1975, p. 3). The ideas, in our case, related to knowledge about knowledge. We agree that 'if there are disciplines of knowledge which are structured, and have logical procedures and tests for truth, is not the aim of teaching as a discipline to explore the structure to get some bearings within it' (Stenhouse, 1975, p. 36).

We feel that the CDC model, drawn upon as a process of professional learning, did indeed enable us to gain 'some bearings' within the discipline of education. We were able to take a step back and consider how the focus on lesson planning in official documentation, often masqueraded as being curriculum design knowledge. This conflation limits our professionalism. We were increasingly cognisant that if we as a group of teacher-researchers benefitted from a more expansive understanding, then it is likely that many of our peers would also gain from such insights. We therefore began to feel a professional responsibility to share our work further, recognising that 'the improvement of practice rests on diagnosis not prognosis' (Stenhouse, 1975, p. 83). This is perhaps even more of an imperative some fifty years after Stenhouse, when 'the increased dominance of econometric approaches' (Tatto, 2021, p.4) makes it even more significant that 'generative and transformative teacher research sit[s] alongside structures and cultures of compliance (Tatto, 2021, p. 28) so that we can 'call into question the powerful influence that market-oriented analysis exerts on policy-makers' (Tatto, 2021, p. 28).

KEY FINDINGS

In relation to our three themes, the importance of epistemology within teacher education, the role of systematic knowledge in professional development, and the role of disciplinary knowledge in curriculum design, our engagement with the CDC model has motivated us to want to be 'proactive in making a more positive contribution to enhancing and increasing the epistemic worthiness' (Evans, 2023, p. 13) of our field by disseminating our work.

In regards to epistemology in teacher education, we wish to argue for a greater emphasis on the relationship between the different forms of knowledge (conceptual knowledge, experiential knowledge, procedural and propositional knowledges) and recognise that different types of relationship generate different educational opportunities.

In relation to the role of disciplinary knowledge in curriculum design, we used concepts as a lens through which to organise content, enabling our pupils to access these 'big ideas'. Without the support of the project, we felt that it was unlikely that we would have had the professional time and space to develop such insights (Author, 2023).

In relation to the role of systematic knowledge in professional development, we have recognised that in order to develop our reasoning capacity in curriculum design, that this 'necessitates the availability of a systematic knowledge base for the profession which can be drawn upon selectively and appropriately' (Hordern & Brooks, 2023a, p. 807).

CONCLUSIONS

We have been pleased to open up own curriculum development work to scrutiny through both the publication of our project report (Author, 2023) and this article. We have valued the opportunity to reflect further on the impact that our engagement with the CDC model has had on our understanding of curriculum, curriculum design, curriculum making and lesson planning. We would concur that 'it is not enough that teachers' work is studied' (Stenhouse, 1975, p. 141) but that we need to study it ourselves We are pleased that as a group of teacher researchers we can contribute to wider professional debates. Stenhouse raised concerns that 'unpublished research does not profit by criticism' (Stenhouse, 1981, p. 11). We are ambitious that our research contributes towards the critical discourses concerned with curriculum and professional development. We hope that, in a modest way we can contribute towards 'intellectual innovation which brings in its trail a press towards social change' (Stenhouse, 1981, p. 103). The change that we wish to press for relates

to the productive discernment between curriculum, curriculum design, curriculum making and lesson planning in teacher education and professional learning. Rather than seeking a national body that offers packaged solutions, we hope that we have demonstrated the need for increased opportunities for teachers to engage in 'systematic self-critical enquiry' (Stenhouse, 1981, p. 103) so that teacher research becomes an integral and essential part of the profession's critical discourse concerned with curriculum design AND curriculum making AND lesson planning. In this way, research is professionally educative and professional education offers opportunities for scholarship within practice, not just scholarship on, with, or for practice.

CONFLICT OF INTEREST STATEMENT
The authors have no potential conflict of interest to declare.

DATA AVAILABILITY STATEMENT
Data sharing not applicable to this article as no datasets were generated or analysed during the current study.

ETHICS STATEMENT
The BERA(2018) Ethical Guidelines for Educational Research were followed throughout this project.

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