



A Critical Knowledge-Led Approach to Curriculum Research and Teacher Education Across School Subjects

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Abstract

This paper examines a critical knowledge-led approach to curriculum research and teacher education across school subjects, drawing on social realist theory, the work of Michael Young and Johan Muller on 'powerful knowledge,' and critical pedagogy frameworks. The paper argues that curriculum design and teacher preparation must be anchored in disciplinary knowledge structures while simultaneously attending to the social and political dimensions of schooling. It synthesises theoretical perspectives from curriculum studies, sociology of education, and subject pedagogy to propose an integrated framework that bridges epistemic rigour with critical awareness. The paper concludes that preparing teachers to engage deeply with disciplinary knowledge, while developing their capacity to question curriculum purposes and structures, is central to educational equity and intellectual development in diverse school contexts.

Keywords: Curriculum research, teacher education, powerful knowledge, social realism, critical pedagogy, subject knowledge, disciplinary thinking

1. INTRODUCTION

Curriculum sits at the heart of formal schooling: it defines what counts as worthwhile knowledge, determines how that knowledge is sequenced and assessed, and shapes the intellectual identities of both teachers and students. Yet debates about curriculum have long been marked by a persistent tension between those who foreground the content of education — its disciplinary structures, epistemic logic, and cumulative nature — and those who emphasise the social, cultural, and political conditions under which knowledge is produced, selected, and transmitted. This paper argues that these two perspectives, far from being mutually exclusive, must be held together if curriculum research and teacher education are to serve students equitably across different school subjects.



The past two decades have seen a significant revival of interest in knowledge-led curriculum frameworks, largely in response to the perceived inadequacy of competency-based and skills-focused reform movements that, critics argue, hollowed out curriculum content and left many students — particularly those from disadvantaged backgrounds — without access to the disciplinary thinking that underpins advanced study and civic participation (Young, 2008; Muller & Young, 2019). Social realist scholars have called for a return to 'powerful knowledge': the systematised, theoretical forms of understanding that school subjects can uniquely provide. At the same time, critical education theorists have insisted that no curriculum framework is politically neutral and that teachers must be prepared to interrogate whose knowledge is institutionalised, whose is marginalised, and with what consequences (Apple, 2004; Giroux, 2011).

This paper synthesises these strands through three interlocking theoretical moves. First, it draws on social realism and the sociology of knowledge to establish what a knowledge-led curriculum entails. Second, it situates this framework within critical pedagogy to address questions of power, equity, and representation. Third, it examines the implications for teacher education — arguing that subject-specialist preparation, disciplinary depth, and critical curriculum literacy are all essential components of a coherent programme for educating teachers across school subjects.

2. THEORETICAL FOUNDATIONS: SOCIAL REALISM AND POWERFUL KNOWLEDGE

The intellectual architecture of a knowledge-led curriculum is rooted in social realism, a theoretical position developed most influentially by Michael Young and Johan Muller, drawing in turn on the sociology of Basil Bernstein. Social realism holds that knowledge is both socially produced and irreducible to the social conditions of its production: scientific theories, historical interpretations, mathematical proofs, and literary analyses have internal structures, disciplinary norms, and truth-seeking procedures that are not simply arbitrary constructions of dominant groups (Young & Muller, 2010). This ontological claim has direct curriculum consequences: it insists that the content of school subjects matters in its own right and cannot be dissolved into generic skills or contextual relevance without significant educational loss.



Central to this framework is the concept of 'powerful knowledge,' which Young (2008) defines as knowledge that is specialised, systematised, and conceptually coherent — knowledge that enables learners to think beyond their immediate experience and to grasp the world in more abstract and generalisable terms. Powerful knowledge is distinguished from 'knowledge of the powerful,' which refers to whatever knowledge dominant groups happen to value. The distinction is critical: access to powerful knowledge is argued to be a matter of social justice, because it is precisely this type of knowledge that has historically been reserved for elite groups while students from disadvantaged backgrounds are offered a curriculum of relevance, experience, and practical skills that reproduces rather than challenges their social position (Wheelahan, 2010).

Bernstein's (2000) concepts of classification and framing provide additional analytical tools. Classification refers to the degree to which subject boundaries are maintained; framing concerns the degree of control teachers and learners exercise over the selection, sequencing, and pacing of knowledge. Bernstein argued that weakly classified and weakly framed curricula, while appearing progressive and student-centred, often disadvantage working-class students who lack the cultural resources to infer the implicit rules of what counts as legitimate knowledge. Strong classification, by contrast, makes the epistemic structure of subjects visible and therefore learnable by all. These insights have been developed into the concept of 'knowledge-building' curriculum design, most notably through the work of Rob Maton (2014) and his Legitimation Code Theory, which provides tools for analysing the 'semantic gravity' and 'semantic density' of curriculum content and the ways in which disciplinary knowledge structures enable or constrain students' capacity to generalise and abstract.

3. CRITICAL PEDAGOGY AND THE POLITICS OF CURRICULUM KNOWLEDGE

If social realism provides a powerful case for knowledge-rich curriculum content, critical pedagogy furnishes the framework for examining the social and political dimensions of curriculum selection. From Freire's (1970) foundational critique of the 'banking model' of education — in which students are treated as passive receptacles for transmitted knowledge — through Apple's (2004) materialist analysis of the relationship between curriculum and capitalism, to Giroux's (2011) concept of teachers as 'transformative intellectuals,' critical pedagogy insists that curriculum is never simply a neutral body of knowledge but always an



ideological artefact that privileges certain forms of knowing, certain cultural traditions, and certain social identities.

For Apple (2004), the official curriculum embodies 'selective tradition': out of the entire range of possible knowledge, certain forms are elevated to the status of legitimate school knowledge while others are excluded or marginalised. This selective process is neither random nor purely epistemological; it reflects the interests, values, and cultural assumptions of dominant social groups. Feminist curriculum theorists (Belenky et al., 1986; Luke & Gore, 1992) have extended this analysis to show how gender has shaped not only which knowledge is included in the curriculum but how legitimate ways of knowing are defined — often in ways that systematically devalue collaborative, embodied, and relational forms of understanding associated with women's experience.

Postcolonial curriculum scholars (Dei, 2000; Thiong'o, 1986) have similarly argued that the curriculum of many formerly colonised nations continues to reflect colonial epistemologies, treating European knowledge traditions as universal while positioning Indigenous and local knowledges as supplementary or inferior. This critique has direct implications for teacher education: teachers who have not been prepared to think critically about the knowledge they transmit may inadvertently reproduce epistemic injustices that undermine the educational experiences and identities of students from marginalised cultural backgrounds.

The apparent tension between social realism's defence of disciplinary knowledge and critical pedagogy's suspicion of institutionalised knowledge is real but, this paper argues, resolvable. Young and Muller (2016) have themselves acknowledged the need to integrate a concern for epistemic justice into a knowledge-led curriculum framework. The key move is to distinguish between the critical examination of curriculum selection — asking why certain knowledge has been privileged and with what effects — and the wholesale relativisation of knowledge, which abandons the distinction between more and less reliable, more and less generalisable forms of understanding. Teachers can and must do both: teach the disciplinary knowledge that constitutes powerful thinking, and develop in students the critical capacity to question the boundaries, purposes, and politics of school knowledge.



4. SUBJECT-SPECIFIC DIMENSIONS OF CURRICULUM KNOWLEDGE

A critical knowledge-led approach must be sensitive to the epistemological differences between school subjects, since different disciplines have distinct knowledge structures, modes of inquiry, and relations between empirical and theoretical knowledge. This subject-specificity is a recurring theme in curriculum research that deserves more systematic attention in teacher education than it typically receives.

In the natural sciences, curriculum knowledge is organised around theoretical frameworks — cells and organisms, forces and energy, atoms and molecules — that have high semantic density and strong classificatory boundaries. Scientific knowledge accumulates through empirical investigation governed by disciplinary norms of evidence and falsifiability. Curriculum research in science education has shown that students' conceptual development depends on explicit engagement with the conceptual structure of the discipline rather than mere experimental activity (Kind, 2009; Osborne, 2014). Teachers need deep subject knowledge not only to explain concepts accurately but to understand the hierarchical sequencing of ideas that makes learning science a genuinely cumulative process.

History, by contrast, operates through a different epistemic logic. Historical knowledge is constructed through the interpretation of evidence, the development of second-order concepts — causation, change, significance, historical perspective — and the weighing of competing explanatory accounts (Lee, 2005; Shemilt, 1987). A knowledge-led history curriculum is not simply one that transmits a canon of historical facts but one that initiates students into the disciplinary thinking through which historical knowledge is produced and contested. Teacher education in history must therefore equip teachers with both substantive knowledge of historical events and processes and procedural knowledge of how historians reason.

In literature and the humanities, questions of interpretive validity, aesthetic judgement, and cultural meaning generate their own epistemological challenges. Maton's (2014) concept of 'knower codes' is particularly illuminating here: in subjects where legitimate knowledge is tied not only to what one knows but to the cultivated sensibility of the knower, curriculum frameworks must carefully navigate the tension between subject-specific cultivated insight and the democratic imperative to make literary and cultural knowledge accessible to all students.



Teacher education in English and humanities must prepare teachers to value both rigorous textual analysis and the lived experiences students bring to literary encounter.

Mathematics presents yet another configuration: a highly hierarchical, strongly sequenced knowledge structure in which prior concepts are necessary conditions for subsequent learning. Research in mathematics education has consistently shown that teacher subject knowledge — particularly what Shulman (1986) called 'pedagogical content knowledge' — is a significant predictor of student achievement. Teachers need to understand not merely how to perform mathematical procedures but why they work, what conceptual obstacles students encounter, and how mathematical ideas connect across the curriculum. A critical mathematics education (Skovsmose, 1994) further requires teachers to help students see how mathematical models are used in social and political contexts and to develop critical fluency with quantitative reasoning.

5. IMPLICATIONS FOR TEACHER EDUCATION

The theoretical framework developed in the preceding sections carries substantial implications for the design and delivery of teacher education programmes. Three dimensions are particularly significant: subject knowledge depth, curriculum literacy, and critical reflexivity.

5.1 Subject Knowledge Depth and Disciplinary Thinking

There is substantial evidence that teachers' subject knowledge — including their understanding of the structure, history, and modes of inquiry of their disciplines — influences the quality of their teaching and, consequently, their students' learning (Hill, Rowan, & Ball, 2005; Monk, 1994). Yet teacher education programmes have often prioritised pedagogical skills over subject understanding, treating disciplinary knowledge as a given rather than as something that requires ongoing development and deepening. A critical knowledge-led approach insists that teacher education must take seriously the epistemic complexity of school subjects.

This means that subject-specialist teacher education should not simply rehearse undergraduate disciplinary knowledge but should help prospective teachers to develop what Wineburg (2001) calls 'disciplinary thinking' — the capacity to reason within the epistemic logic of a subject, to understand how knowledge in that subject is produced and validated, and



to recognise the conceptual architecture that underlies curriculum content. Apprenticeship into disciplinary thinking equips teachers to make principled curriculum decisions, to sequence learning coherently, and to identify and address students' conceptual misconceptions.

5.2 Curriculum Literacy and Knowledge Selection

A second dimension concerns what this paper terms 'curriculum literacy': the capacity to analyse, critique, and design curriculum with an informed understanding of how knowledge is selected, organised, and sequenced. Teacher education programmes rarely address curriculum as an object of study in its own right; prospective teachers are more often positioned as curriculum consumers — following schemes of work, preparing students for examinations — than as curriculum thinkers capable of interrogating the decisions that shape what they teach.

Developing curriculum literacy requires engagement with curriculum theory, the sociology of knowledge, and subject-specific curriculum research. Teachers who possess curriculum literacy can recognise the knowledge structures embedded in curriculum documents, evaluate the coherence of curriculum design, understand the implications of assessment regimes for what knowledge is taught and how, and engage constructively in curriculum reform (Priestley & Biesta, 2013). This is especially important in national and international contexts where curriculum reform is rapid and contested, and where teachers are increasingly expected to exercise curriculum agency rather than simply implement externally designed programmes.

5.3 Critical Reflexivity and Epistemic Justice

The third dimension concerns the development of critical reflexivity among teachers — the capacity to examine their own assumptions about knowledge, to question whose knowledge is represented in the curriculum they teach, and to consider the implications of curriculum choices for students from diverse social, cultural, and linguistic backgrounds. This dimension draws directly on critical pedagogy and postcolonial curriculum theory.

Preparing teachers for critical reflexivity requires structured engagement with the politics of curriculum knowledge: opportunities to interrogate canonical knowledge and its exclusions, to explore alternative knowledge traditions, and to consider how curriculum experiences shape students' epistemic identities — their sense of themselves as knowers and as subjects of knowledge (Dotson, 2014). This is not an argument for abandoning disciplinary



knowledge but for teaching it in ways that acknowledge its situatedness, its historical production, and its ongoing contestation. Teachers who have developed critical reflexivity are better placed to create intellectually rigorous and culturally responsive classrooms.

6. TOWARDS AN INTEGRATED FRAMEWORK

The theoretical analysis presented in this paper supports the development of an integrated framework for curriculum research and teacher education that holds knowledge, criticality, and subject-specificity in productive tension. Such a framework would be organised around four interrelated principles.

First, epistemic coherence: curriculum design and teacher education must take seriously the internal logic and structure of disciplinary knowledge. Curriculum sequences should be designed to build conceptual understanding cumulatively, and teachers should be prepared to understand the epistemic architecture of their subjects deeply enough to make principled instructional decisions.

Second, knowledge equity: access to powerful knowledge is a matter of social justice. Curriculum frameworks must be evaluated not only for their epistemic coherence but for their capacity to extend the boundaries of what knowledge is available to all students, regardless of social background, cultural identity, or prior academic achievement. Teacher education must prepare teachers to hold high expectations for all students and to understand the cognitive demands of disciplinary thinking well enough to scaffold access appropriately.

Third, critical curriculum awareness: teachers should be prepared to engage with curriculum as an ideological and epistemological artefact. This requires curriculum literacy — the ability to read, evaluate, and design curriculum — and critical reflexivity — the capacity to interrogate the social and political assumptions embedded in curriculum choices.

Fourth, subject-specific pedagogical knowledge: general frameworks for curriculum and pedagogy must be supplemented by subject-specific knowledge of how disciplinary thinking is developed, what conceptual obstacles students encounter, and how the distinctive epistemic logic of each subject shapes the design of learning experiences.

7. CONCLUSION

This paper has argued for a critical knowledge-led approach to curriculum research and teacher education that integrates social realist insights about the importance of disciplinary



knowledge with critical pedagogy's attention to power, equity, and representation. Against both the knowledge-free progressivism that dissolves curriculum into generic skills and the uncritical conservatism that treats curriculum content as self-evidently given, this paper proposes a framework in which epistemic rigour and political awareness are mutually reinforcing rather than opposed.

The implications for teacher education are substantial. Teacher preparation programmes must develop prospective teachers' subject knowledge depth, curriculum literacy, and critical reflexivity in tandem, recognising that these capacities are not separate modules but integrated aspects of professional expertise. Teachers who understand their subjects deeply, who can think critically about curriculum, and who are committed to epistemic justice are better equipped to provide all students with access to the powerful knowledge that formal schooling can uniquely offer.

Further empirical research is needed to explore how these principles translate into practice across different subject areas, school contexts, and national curriculum systems. In particular, longitudinal studies examining the relationship between teacher education programmes that integrate subject knowledge, curriculum theory, and critical pedagogy, and the curriculum experiences of students from diverse backgrounds, would make a significant contribution to the evidence base. The theoretical framework developed in this paper aims to provide a coherent foundation for such research.

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