What Should Schools Teach? Disciplinary Knowledge and the Pursuit of Truth in the Curriculum/Disciplines, Subjects and the Pursuit of Truth

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Contents

Introduction

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'*When the past no longer illuminates the future, the spirit walks in darkness.*' Alexis de Tocqueville, *Democracy in America* (1835)

The nature of disciplinary knowledge in the curriculum is important to address in 2017 because its content, value and purpose have waned in schools, and even some university departments. Many young people entering the teaching profession are unclear about the role of disciplines and knowledge in the school curriculum and the education of children, and some don't understand how academic knowledge is different from other types of knowledge, or what distinguishes knowledge from opinion. For those already working in the profession, including experienced teachers and representatives of examination boards, subjects have come to be viewed less in terms of epistemic principles and value and more as a means to another end such as developing marketable skills, facilitating well-being, promoting diversity or addressing global issues. For the last two decades, the curriculum has been treated as a vehicle or tool to address a whole host of economic, social and environmental problems in society rather than emphasising its intrinsic value – *the development of knowledge and understanding*. While education has several worthy extrinsic aims, such as gainful employment, socialisation and learning about the responsibilities of citizenship, their success is contingent upon learning the 'generative principles of disciplinary knowledge' which enable young people to transcend their particular context (Wheelahan, 2010: 107). It is when extrinsic aims become dominant over educational aims and start to drive the content and shape of the curriculum that its intrinsic quality becomes corrupted or undermined, and

education suffers (Furedi, 2009/2016). In essence, today there is a very weak theory of knowledge and the curriculum in British schools today.

This situation has arisen in part because of the growing *instrumentalism* in the curriculum (using education for extrinsic ends) and the prominence of social constructivist theory in education and schools over the past two to three decades. Since the national curriculum was introduced in 1991 what schools teach has become increasingly politicised and subject to external intervention by government, business and non-governmental organisations (NGOs), diminishing the professionalism of teachers and corrupting the curriculum (Whelan, 2007). For a detailed explanation for how and why 'knowledge was dethroned and displaced' in schools readers are referred to Wheelahan (2010). In short, the special place of knowledge in society has been undermined by a more general erosion of authority in society – its traditions and institutions including family, church, state, unions and political parties. Wheelahan notes how the blurring of the boundaries between school and society has facilitated the instrumental approach to curriculum – knowledge is not valued in its own terms but is treated as a means to achieve some other aim (employability, health and well-being, environmental awareness). Particularly damaging is the way that education is treated in terms that belong in the world of work: developing competences rather than knowledge and teaching learning objectives that are measurable and used to demonstrate pupil 'progress'. School systems are being driven by accountability measures, but outside of a framework of educational aims tied to the acquisition of worthwhile knowledge, the effect of which is that knowledge is given only instrumental worth (Beista, 2005/2007; Pring, 2013).

But the place of knowledge has also been undermined from within schools and universities. Wheelahan (2010) cites how post-modern theories have led to a focus on the context and the self-interest of individuals involved in knowledge production, at the expense of its objectivity. For many working in the social sciences and humanities knowledge is seen as

inherently political and therefore largely a matter of personal perspective. If universities are treating knowledge as relative then it no longer holds special status in society. In education, the theory of social constructivism shares the post-modern emphasis on the knower (whose knowledge) rather than seeing knowledge as a social practice for achieving insight, clarity of understanding and truth. With the place of knowledge being downplayed in the curriculum, many teachers have been inducted into the profession through theories that focus on pedagogy and the child's experience, therefore prioritising 'learning' over the knowledge pupils need to learn (Beista, 2005; Young, 2008). The displacement of knowledge in the curriculum is echoed in the work of Ecclestone and Hayes (2009) who identified how teachers and lecturers were focusing on therapeutic aims in the classroom at the expense of academic goals. Richard Smith (2002) shares a similar concern about an educational culture that exalts self-esteem as the chief educational aim, or presents all things educational from a therapeutic perspective. The blurring of the distinctions between pedagogy and curriculum and experience and knowledge have resulted in a generation of teachers who are confused about the part that each of these plays in the education of children.

Schools may still teach through subjects, but there is little consensus about what constitutes a subject and what they are for. This is in spite the recent reform of the national curriculum for England and Wales, which aimed to re-focus the curriculum on subject knowledge (Department for Education, 2010). While the new curriculum does include significant and valuable academic knowledge it has been widely criticised by schools and educationalist, if not dismissed, as only reflecting the perspective of the Coalition government (Conservative Party and Liberal Democrat Party) who led the reform. And, with the Department for Education announcing that the new curriculum does not apply to free schools and academies, it is no longer a *national curriculum*. What was missing from the reform was a clear rationale

for why this knowledge is important for children to learn in the twenty-first century and what different forms knowledge takes. It is to these matters that we aim our attention in this book.

The aim of this book is to contribute to a more robust rationale for and understanding of what schools should teach – *the curriculum*. This is not to dismiss the significance of pedagogy, how children learn and the personal knowledge and experiences they bring to the classroom. Rather, to become a successful teacher depends upon understanding the respective roles of each. And, the curriculum – *what to teach* – is logically prior to how to teach it. There is no more important question in education. So, rather than just following the national curriculum or the latest examination specifications, we aim to encourage schools and teachers to engage in discussion, thought and debate about what a curriculum is for, how knowledge is selected, organised and structured, and why. While the best schools already do this, too many schools have become focused on teaching to the test, measuring 'progress', safeguarding, marking and pupil feedback, the three-part lesson, mindfulness, information technology, learning styles or personal, social and health education, at the expense of the curriculum. Our primary audience is beginning teachers, although we hope to provoke a broader discussion in schools and with others engaged with education, including parents and governors of schools. The nature and role of disciplinary knowledge in the curriculum is important for both primary and secondary schools because a child's educational journey is dependent upon comprehension of conceptual knowledge derived from disciplines. While the scope of this book is focused on the secondary curriculum we recognise that there is further work needed in order to examine the role of disciplinary knowledge in the primary curriculum, and indeed what is meant by disciplinary knowledge in the context of primary education.

In particular, we think that all teachers and schools should know answers to the following questions: What does it mean to study a discipline and what is its value? Why is disciplinary knowledge important for the curriculum? What is a school subject and how are subjects

related to disciplines? What different forms does knowledge take and what implications does this have for structuring the curriculum? How does disciplinary knowledge contribute to the education of children? Can and should all children learn disciplinary knowledge? What happens if children miss out on academic knowledge? In doing so, we also explore the different forms that subject knowledge takes and what each adds to the education of the next generation of citizens.

As we enter into a discussion about the school curriculum, it is useful to begin with R.S. Peter's observation that education does not have its own values (Peters, 1964). Questions about what schools should teach are 'philosophical and political questions about who we are and what we value' (Young, 2008: xvi). Similarly, the philosopher John Searle (1995) notes that allocating a function to any phenomena necessitates the identification of a prior set of values. This suggests that any theory of education and the curriculum must be related to a theory of society (Young and Muller, 2016). Our starting point, therefore, is the culture and social system (liberal democracy) of where we live - the United Kingdom. We do not mean this in an exclusive sense, nor do we wish to revert to a past view of culture. The UK today is very multicultural and all the better for it. Neither does this mean that we think education should focus solely on one culture – children should learn about many cultures. What it does mean is that the choices we make about what to include in a curriculum will reflect the beliefs and values upon which our society is based. Whilst we recognise the plurality of beliefs in UK today and that this presents a certain challenge for schools today, the curriculum should at the very least reflect and maintain the foundations of liberal democracy. Liberal democracy is no accident of history but has been fought for and built upon the notion of *autonomous individuals* who are equal before the law and allowed *freedom of thought* and *speech*. These ideals will inform curriculum selection and the individuals schools aim to nurture. Indeed, the very maintenance and sustenance of democracy is dependent upon a

curriculum that provides the knowledge children need to assume the responsibilities of citizenship (Rata, 2012).

There is also one value upon which all disciplinary knowledge depends: *truth*. The pursuit of truth is what distinguishes disciplinary knowledge from everyday, social and cultural knowledge. And, truth has an important role to play in the successful functioning of liberal democracies. We must recognise that there are different sources of truth in society – religious and secular (again being a product of history and culture), and that both *belief* and *reason* have their place in education. In his essay *Truth and Truthfulness*, Bernard Williams speaks to the place of truth in education: 'you do the best you can to acquire true beliefs, and what you say reveals what you believe' (Williams, 2002). Williams asserts that truth is the basis for the authority of scholarship, at all levels of education. Nevertheless, scholars must also live with an understanding of the fallibility of our accounts of truth. Without going too far into our theory of knowledge, below, we will show that knowledge is social – it is a human construct and therefore susceptible to the limitations of our theories and ideas. It is precisely because knowledge is constructed that normative constraints within a discipline are needed. The conceptual and procedural criteria necessary for producing and validating knowledge means it cannot be arbitrarily constructed. And, it is the job of the teacher to induct pupils into the disciplinary-specific procedures, methods and habits required for the pursuit of truth.

We will say more about truth in the first chapter, drawing on the work of Johan Muller and Michael Young (2016) – exploring how objectivity takes different forms depending upon the type of disciplinary knowledge.

Already it should be evident that we are working towards a theory of education and a vision of the individual child we want to shape. Following the insights of Michael Oakeshott among others, we argue that education is about cultivating our humanity. Oakeshott reminds us that

no child is born human, 'man is what he learns to become: this is the human condition' (Oakeshott cited in Fuller, 1989: 39). A starting principle then is that we want to induct children into disciplinary knowledge developed across societies over many generations. We want to show children the world, and to teach them different ways of thinking, expanding their horizons and deepening their understanding of the human condition. But it is not just any knowledge and all knowledge that accomplishes such as task. What is unique and special about schools as institutions is that they introduce children to specialised and valuable forms of knowledge. As Michael Young explains, 'The primary purpose of education is for students to gain access to different specialist fields of knowledge' with a view to their 'intellectual development' (Young, 2014: 149), including the faculties of reason, enquiry and imagination.

This approach contrasts with the child-centred approach to education, the theory of social constructivism and more recent work of Ken Robinson (1998) and Michael Reiss and John White (2013). While we concur with the aim of developing individual autonomy and capability, our departure from these perspectives is that we see the teacher as agentive in curriculum selection and teaching the knowledge that children need to learn to achieve these aims. While the intellectual, cultural, spiritual and moral development of the child are worthy ideals, some educationalists and schools have been reluctant to recognise that this can *only* be achieved through the study of a curriculum that draws from cultural traditions and specialised knowledge (Kennedy, 2014; Young 2008). Broadly speaking, we can differentiate between knowledge that is moral (what is right), aesthetic (what is beauty) and epistemological (what is true). In schools, pupils should be introduced to the realms of human experience through the study of languages, mathematics, sciences, the arts and the humanities. This is important when considering a school curriculum as different forms of knowledge will help the child to develop in different ways and to see connections between different forms of knowledge.

Limited children's exposure to only one or two forms of knowledge would be restricting their insights and opportunities to grow in different ways.

A number of school subjects are focused on the development of disciplinary knowledge and are closely related to university disciplines, such as history, sciences and the arts. These subjects are often held in higher regard in society, for reasons we will explore. The Russell Group of UK universities identifies eight 'facilitating' subjects which it encourages students to take at least two of at A Level. The list comprises of English literature, modern and classical languages, chemistry, physics, biology, history and geography, but does not include other academic subjects like music, art or sociology and politics. For us, it is the educational worth of the subject that matters – that it helps children to explore some aspect of truth about the world and humanity. This book presents a series of chapters written by secondary school teachers and lecturers each of whom describes their discipline, how it evolved in relation to an area of human enquiry and how it helps us to explore an aspect of truth. Each chapter also examines how the discipline is 're-contextualised' in the context of school subjects (Bernstein, 1999). This means how the subject is related to and prepares the pupil for further study in the discipline, should they so choose, and so the idea of progression is important. While we apply the term disciplinary knowledge to both schools and universities we recognise that the concepts and methods being learnt in schools have been 're-packaged' in a simplified form from universities. But the term disciplinary knowledge is preferred over subject knowledge precisely because the relationship between subjects and disciplines has weakened and is in need of re-examination.

We are not claiming that these chapters present the only or even the best account of disciplinary knowledge in the curriculum. What we are asserting is each chapter illustrates the kind of curriculum thinking that should be going on in schools and in relation to education policy making. Involving both teachers and lecturers in the writing of this book

was a conscious choice because of the necessity for schools and universities to be speaking a common language, sharing aims and practice. While there are some obvious differences between schools and universities, both have a role to play in introducing young people to society's intellectual traditions and knowledge, and preparing future teachers. As such, they need to work together.

What is special about these academic subjects is that they introduce pupils to disciplinary knowledge by teaching them conceptual thought or *know that* (Winch, 2013). Conceptual or propositional knowledge is valuable because it enables the child to understand that which is not evident at the level of perception (for example, how a child's perception and experience of fluids or space is transformed by the concept of volume). It is only by abstracting from the concrete world of objects that we can comprehend generalisations and manipulate ideas to identify patterns and relationships. As we will show, the boundaries of disciplines are not arbitrary but reflect their different object of study or a particular method of enquiry (Wheelahan 2010). Whether young people decide to pursue higher education or not, we think that disciplines, as practices of intellectual exploration and wisdom, are of sufficient importance that all children should have the opportunity to study them and benefit from the insights they offer.

We do not wish to minimise the role of so-called 'non-academic' subjects. All subjects have their place and contribute to the education of the child. Schools do more than develop the mind – they also teach children practical skills, physical education and social skills, including how to live as part of a community. More practical subjects, like technology teach skills and develop *know how* (Winch, 2013). Yet, with each of these broader aspects of education there is still an aspect of *know that* related to disciplinary knowledge. For one to be skilled in technology means drawing upon knowledge from science, mathematics, engineering and art. Similarly, with citizenship; while the subject clearly aims for social and political

participation, the curriculum develops knowledge of democracy, law, government and social institutions, which itself are derived from the disciplines of history, politics and law. And, in physical education the student must draw from knowledge of anatomy, physiology, psychology and sometimes the arts.

Our aim in writing this book is to examine the special nature of academic subjects, their relationship to university disciplines and why they are of particularly high value to young people and society in general. Therefore, before we address subjects we need to understand the meaning of disciplinary knowledge and from there it will be possible to consider the relationship between school subjects and university disciplines. This will be followed by a series of chapters that explore the meaning of disciplinary knowledge in the context of individual subjects from the curriculum. While including every subject from the curriculum would make the book very long, we have opted for a selection of subjects that cover the different realms of disciplinary knowledge (mathematics, languages, natural science, social sciences and the arts). The chapters are ordered according to the forms of knowledge and therefore do not indicate priority. Each chapter explores the nature of the discipline, the form knowledge takes in school and how it contributes towards the education of children.

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Chapter One

Disciplinary Knowledge and School Subjects

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'*The objective of education is to learn to love what is beautiful.*' Plato, *The Republic.*

What is disciplinary knowledge?

The disciplines that form the basis of the curriculum and research in modern universities have roots going back millennia and transcend civilizations. We should begin by acknowledging that there is a significant gulf between the intellectual activities of ancient scholars and the work of modern scientists and artists. In *Disciplines in the Making*, Lloyd (2009) suggests that it may be 'absurd to use to the same rubric of "science"' to describe both the theories produced by ancient cultures and the modern-day scientist in her laboratory. Nevertheless, here we want to recognise that the latter has evolved from the intellectual curiosity, work and creative endeavours of people in former societies, being passed through generations and across cultures. Here, we shall call this 'emerging disciplinary thought'.

Next, it is important to note that emerging disciplinary thinking took place in a number of different civilizations, that this took different forms (depending upon contextual circumstances and prevailing cultural norms) and that ideas diffused between them. That Ancient Greece is the source of many contemporary ideas about philosophy, mathematics, science and politics is well-established. The Greek intellectual tradition evolved under conditions of conflict with surrounding political and military authorities and was characterised by methodological and epistemological disagreements, being driven by a

pursuit for certainty. The Greeks were particularly interested in questions of ontology, epistemology, philosophy of the mind, aesthetics, ethics and political philosophy. While the Greeks provide the original use of terms such as *historia* and *geographia*, Lloyd notes that under these headings a wide range intellectual investigation took place. For instance, he suggests that *historia* could refer to 'any research or its end product' (Lloyd, 2009: 66).

There were parallels and differences with emerging disciplinary thought in Ancient China. While Chinese scholars were keen to explore nature, government, welfare, ethics and the divine, there was no direct reference to philosophy until after the end of the Han dynasty in 206 CE. The category 'philosophy' was introduced into China followed a Japanese reference which in turn came from contact with Europe (*Ibid.*). Chinese culture was particularly concerned with order, right conduct, right government and harmonious living, thus emphasising social practice rather than abstraction. 'The *dao* was not a matter of knowing the answers to theoretical questions, but of knowing what conduced to correct behaviour, indeed not just knowing that, but practicing it,' reports Lloyd (*Ibid.*: 13). Confucianism meant working towards an elusive ideal, but there was no immediate challenge from an alternative political constitution. And, if we look at one discipline as an example, Lloyd notes how the Chinese did not distinguish mathematics from the natural sciences. Instead, mathematics was dealt with in the context of the natural problems from which it arose, such as with earth, water, minerals and music. Moreover, in China mathematical enquiry was directed by principles of equality and harmony, therefore 'distinguishing categories in order to unite categories' (*Ibid.*: 54). So, while scholarship in China enjoyed greater support from government, in Greece there was a stronger tradition of discussion and dispute.

We find different emphases still in Ancient India and Islamic territories. While in India there are significant parallels with Greece in terms of ontology, metaphysics, logic and philosophy of the mind, there was a greater reflection on language and also the self. Buddhist and

Brahman thought encouraged the transcendence of the self through spiritual exercises – alleviating the individual of worldly desires and experiences. Lloyd notes references to Ancient Greece in some Buddhist teaching, although suggests that Nyãyã logic may well have had its own tradition. The links between the intellectual traditions in Greece and Islamic empires of the Middle Ages are clearer. Greek texts were translated into Syriac and later Arabic and well-used by Islamic scholars such as Ibn Sina and Ibn Rushd. Timbuktu became an important centre of scholarship during this period and many Arabic manuscripts are still maintained in its contemporary libraries. Nevertheless, the place of this knowledge and especially *falasifa* was subservient to Islam, at times leading to conflict between the two. Muslim scholars advanced knowledge in mathematics, medicine, geography, astronomy and philosophy, works that were later translated into Latin and distributed in Europe. This was at a time when Europe's first universities were run by the Catholic Church, whose primary focus was moral knowledge and the development of the self, embodied in a curriculum known as the *Trivium* (grammar, logic, rhetoric) (Muller, 2012).

What distinguishes this emergent intellectual work from contemporary disciplinary knowledge? In short, the Scientific Revolution in natural philosophy of the sixteenth and seventeenth centuries followed by the Enlightenment. The empirical tradition was established through the work of Copernicus, Galileo and other scientists. Experimentation and the hypothetical-deductive method led to a concern for accuracy, improved methods of verification and systematisation of knowledge. More accurate instruments were created to measure and to collect data, such as microscopes and telescopes, and more precise measures were developed for recording time and distance. The outcome was a more rigorous and robust process of 'testing, elaboration and systematisation' or what Burke calls 'scientification' (2016: 18). For instance, we can contrast modern-day astronomy with the more mythical astrology.

Over time, the arts have been attributed with varying purposes and have been judged differently within academia which, as Furedi argues (2017), might have greater or lesser degrees of institutional autonomy, but is not exempt from society's supervening cultural ideals. Plato famously viewed most examples of art with distrust because of their appeal to the emotions, which he thought distracted from the pursuit of truth through reason (O'Hear & Sidwell, 2009; Plato, 1997). For Jacob Burkhardt, the flourishing of the arts during the Renaissance was part of a wider project of greater human individuation and perfectibility (Lukes, 1973). For the Romantics, the arts were the means to access truths of greater human significance than those arrived at in other spheres of knowledge and life.

In the twentieth-century the traditional justification for an education in the arts – to uphold cultural standards of discrimination and taste – became increasingly unfashionable in the light of a culture seeking increasingly to define itself in opposition to past standards, whether in politics or culture more widely (Barkan, 1962). From a political perspective, education, or appreciation, was criticised for being little more than an apology for bourgeois values. From an educational perspective, the early decades saw certain ideas from Rousseau and Dewey converge in a reconceptualization of art in education as being primarily focused on the spontaneous expression of the child. Art came to be regarded as closer to play than an aesthetic discipline. Eventually, the sciences and the arts came to be understood as antithetical, rather than complementary, epistemological categories.

Important to the transition to modern disciplinary knowledge was the emphasis placed upon humanity's consciousness of objects of study. People's capacity for knowledge was a challenge to divine authority and the agency of the scientist or artist became central to the endeavour to advance knowledge and understanding. 'Dare to know' was the challenge laid down by Immanuel Kant. Hence, the Enlightenment period was characterised by a spirit of curiosity and the advancement of knowledge about the world. In education, the *Trivium* was

supplemented by the more science-orientated *Quadrivium* (arithmetic, geometry, music and astronomy). While humanity's quest was turned towards knowledge of the world 'inner cultivation' was retained 'as a condition for outer appropriation' (Muller, 2012: 115). Thus, the empiricist adventure maintained a spiritual and ethical imperative. We find both of these qualities exemplified in the eighteenth-century expeditions of James Cook's voyages across the Pacific. His crew consisted of scientists, painters, astronomers and surgeons. Botanist Joseph Banks was charged with collecting, recording and documenting thousands of species of flora and fauna, which were returned to London and stored at Kew Gardens. But, Cook's men also spent months with the Tahitians, learning about their cultural practices and way of life. What could be classified as a pioneering ethnographic study was in marked contrast to the barbarity inflicted upon indigenous peoples by most European colonists (Livingstone, 1992).

Yet, it wasn't until the nineteenth century that the modern-day boundaries of disciplines began to take shape. Some Enlightenment scholars such as Alexander Humboldt continued to view their intellectual work in expansive terms. Humboldt attempted to write a geographical study of the whole world, the title of which was *Cosmos*. In the late eighteenth century Kant proposed that knowledge could be organised either conceptually or physically (in space or time), although he still saw history and geography as encompassing all knowledge. Nevertheless, this insight laid the basis for distinguishing between different types of knowledge in the following century, propelled by the establishment of the research university in Germany, notes Burke (2016). With the modern university humanity's intellectual adventures became more *specialised* into distinct areas of knowledge maintained by communities of scholars. Disciplinary boundaries were demarcated and took concrete form in university departments. This specialisation of knowledge was not arbitrary but resulted from

the different objects of study, different forms of knowledge or from different methods and modes of enquiry (Muller, 2012).

Moving on from the historical evolution of knowledge and disciplines, we can say more about the contemporary form of disciplinary knowledge and how it is different from other types of knowledge – such as general knowledge, cultural knowledge or knowledge in practical pursuits, like cooking. For this purpose, we will draw on the theory of *social realism*. While the dominance of social constructivism in educational institutions has led to a focus on the social context and the people who construct knowledge, social realism aims to better understand knowledge itself – including different forms of knowledge and their epistemological frameworks – is structured and is advanced, as well as its reliability and truth claims.

What is special about contemporary disciplinary knowledge, in contrast to general and cultural knowledge, is its claim to objectivity and to advance truth. But, how can knowledge be a product of individual mental activity and also be social and objective at the same time? Drawing on the work of contemporary social realists (Maton, 2010; Moore, 2007; Muller, 2000; Rata, 2012; Young, 2008), we show that the objectivity of truth claims depends upon (i) their external validity – they explain objects of study in a convincing way, (ii) their internal consistency – that they are coherent and follow logic, and (iii) their ability to invoke support from a specialist community of experts and with a wider legitimacy. Below, we explore each of these criteria in turn.

External validity

An essential distinction for teachers is the difference between personal experience and abstract knowledge (a distinction which can be traced back to the work of Durkheim, 1956). Pupils bring to the classroom their own knowledge they have acquired through their everyday experiences and social interactions. The central task of the teacher, at all educational stages, is to introduce pupils to conceptually or aesthetically rich knowledge that transcend individual and context. As René Descartes recognised, the main reason that we need conceptual or propositional knowledge is that 'our senses sometimes deceive us' (Descartes, 1639). This step of abstracting from a particular context allows for the possibility of generalisation (concepts that can be applied to a range of objects) and explanation (identifying relationships that are not perceptible at the concrete level). When we learn a new concept it often changes the way we see the known world or transforms our everyday concepts because it is through concepts that we think and interpret. Think about how difficult it would be to makes sense of phenomena without concepts such as volume (for liquids or space), refraction (for the changing direction of light), evolution (for our relationship to animals) or migration (for multicultural communities).

While concepts are abstractions from reality, knowledge needs to explain the real world in a convincing way. Theoretical frameworks must therefore relate to data about the object of study. Theoretical knowledge and real world application stand in relation to each other. People view the world through the conceptual frameworks they have acquired from education and study. While we use these frameworks to make sense of and interpret data we may also decide that they need modifying when the data no longer fits the theoretical model or fits it imperfectly. In studying subject knowledge pupils need to learn contextual knowledge (dates, locations, distributions, statistics, examples, specimens etc.) about the object of study. These are the raw material pupils will work with when applying theoretical knowledge.

It is also important to understand that the process of objectification (concept formation) takes different forms depending upon the relationship between the symbol (concept) and the object. Ernst Cassirer (1996) showed how the relationship between symbol and object was different for natural concepts and cultural concepts, resulting in different forms of knowledge in the natural sciences and social sciences or humanities. With natural objects the concept can potentially subsume the object and does this through empirical verification. On the other hand, the social sciences and humanities deal with concepts of concepts. Here, the concepts are mediated by other concepts and so the relationship is less direct and potentially less precise. Nevertheless, in both sciences the aim is the same: 'achieving the maximum absorption of the object by the concept' and also 'the maximum abstraction or objectification possible under the circumstances consistent with the nature of the objects under study' (Young and Muller, 2016: 30). While different areas of disciplinary knowledge have different aims, in each there is an aspiration for *Truth* – they seek to describe and account for some aspect of reality (Polyani, 1962).

The process of forming abstract concepts has historically provided a foundation for systemising the real world, a discursive language and a tool of thought (Young and Muller, 2016). Even when concepts fail to fit reality they have still provided us with a means for thinking about an object in a certain way and, when they are wrong, this proves the rigor of testing procedures (discussed below), 'building the discipline's symbolic code and integrating structure' (Rata, 2012: 60).

Logical consistency

Each discipline has developed their own distinctive approach or 'symbolic code' to their objects of study. Geographer Richard Hartshorne (1939) noted that it is not possible for one concept to capture an object in its totality. Most disciplines will aim to capture a particular

aspect of an object in response to the particular questions they are asking – its composition, how it behaves, how it is used, how it varies with time or its relationship to other objects. The arts are different in that the artist is interested in the wholeness of the object under examination. Already we can see that the distinctive approach of a discipline will result in the construction of a framework or system of concepts unique to its way of interpreting its object of study. Learning a discipline means entering into the system and comprehending its particular framework of concepts. The epistemological identity of different forms of disciplinary knowledge has significant implications for those responsible for recontextualising disciplinary knowledge into school subjects.

The educational theorist Basil Bernstein (1999/2000) differentiated between knowledge that is hierarchical in structure versus knowledge that is horizontal in structure. Hierarchical knowledge progresses through increased levels of abstraction, as with the natural sciences. Greater levels of abstraction facilitate understanding of relationships, powerful explanations and the establishment of generalisations or laws. With knowledge that demonstrates horizontal structure, knowledge progresses through adding new segments of knowledge that are distinctive, but related, to the previous knowledge, as with the arts, humanities and social sciences. Hierarchical knowledge can be pictured as a triangle with concepts arranged in increasing levels of complexity while horizontal knowledge can be conceived as a line of connected circles, often with lateral connections between them (Vernon, 2016). Some disciplines, such as geography and mathematics, demonstrate aspects of both hierarchical and horizontal structure because the knowledge is segmented, but hierarchical within segments. We are not suggesting that disciplines fit neatly into Bernstein's framework. Rather his analysis provides us with an analytical tool to comprehend how knowledge can progress in different ways.

There are significant curricular implications from the framework of knowledge forms presented by Bernstein. He demonstrates that some knowledge is concept rich and advances through a hierarchy of concepts, meaning that sequencing of learning is paramount. More horizontal knowledge structures, on the other hand, tend towards diversification and can be content rich (what is being conceptualised), and therefore a less obvious sequence for teaching. Still others, especially applied knowledge in the professions, proceed from the demonstrated practices – finding new ways of doing things. And, the arts provide the basis for a *sui generis* form of aesthetic knowledge which works on principles of interpretation rather than concept building and strict logical consistency.

Community of specialists

While disciplines are a 'systematically organised body of knowledge covering a field of interest with distinctive methods of enquiry' (Winch, 2013: 141), they are maintained by a community of scholars committed to the advancement of knowledge or 'epistemic ascent' (Winch, 2013). Each discipline has its own *purpose, object of study, organising concepts, modes of thought,* c*onceptual framework of knowledge* and *methods for validating and acquiring new knowledge*. These are by no means fixed and within the same discipline there often co-exist different approaches, methods and organising concepts or frameworks. At times, disciplines may well be characterised by a distinct lack of consensus about its organising concepts or principal modes of enquiry, with different paradigms or schools of thought in co-existence. However, this is of course a positive attribute of universities. Competing ideas and theories are the essence and substance of disciplinary thought, facilitating the creativity of scholarly work.

While it is important to acknowledge the diversity of approaches and even beliefs within a discipline, here we need to emphasise the distinctive methods for validating and acquiring

new knowledge. Each discipline has historically tested and established *procedural knowledge* – methods of enquiry for conducting and scrutinising research, as well as for critique and the verification of findings. This includes the review and communication of research findings through publication. This involves scholars reading and commenting on the *reliability* of the work produced, and its acceptability for distribution within the disciplinary community. Drawing on Karl Popper's notion of falsification in the sciences, it is the openness to challenge and the processes of *verification* within specialist communities that make knowledge a social product, and give rise to its reliability (Moore, 2009). While social constructivism portrays 'knowledge' as inseparable from the individual, social realism conceives of knowledge production as entirely social and resulting in 'a materiality that is separate from its creator' (Rata, 2012: 57). Indeed, new knowledge is only made possible by the work of others, both in the past and present. Elizabeth Rata emphasises how the individual is *agentive* in the production of knowledge. 'In order to be a critic within disciplinary systems and procedures' suggests Rata, the researcher 'must be capable of objectifying their own conditions of existence, including the symbolic relations of production within which they are located' (2012: 69). Knowledge and experience, garnered from working within the restrictions of the discipline, is what differentiates intellectual critique from everyday criticism (which is not to say the latter is wholly illegitimate, or that that there are no points of contact between criticism and critique).

What is a school subject?

Schools, as places of learning, introduce children to humanity's intellectual traditions that take them beyond their personal experiences (Pring, 2013). Through the study of subjects 'students are drawn from their world and made to enter a new one' (Masschelein and Simons,

2015: 38). While children may be familiar with the world around them, animals, plants, landscape, cityscape, different countries, different cultures and so forth, the theoretical and conceptual frameworks drawn from disciplinary knowledge enable the child to see the world differently: they begin to see a greater range of differences, to recognise patterns, structures, connections, purposes, processes and how phenomena have evolved. The following extract from *In Defence of the School* exquisitely captures this transition:

> She had seen those animals often. She knew some of them by name. The cat and the dog, of course – they run around at home. She knew birds too. She could distinguish a sparrow from a tit and a blackbird from a crow. And of course all the farm animals. But she never gave it a second thought. That's just how it was. Everyone her age knew these things. It was common sense. Until that moment. A lesson with nothing but prints. No pictures, no movies. Beautiful prints that turned the classroom into a zoo, except without the cages and bars. And the voice of the teacher who commanded our attention because she let the prints speak. Birds got a beak and the beak a shape, and the shape spoke about the food: bug eaters, seed eaters, fish eaters…She was drawn into the animal kingdom, it all became real. What once seemed obvious became strange and alluring. The birds began to speak again, and she could suddenly speak about them in a new way. That some birds migrate and others stay put. That a kiwi is a bird, a flightless bird from New Zealand. That birds can go extinct. She was introduced to the dodo. And this in a classroom, with the door closed, sitting at her desk. A world she did not know. A world she had never paid much attention to. A world that appeared as if from nothing, conjured by magical prints and an enchanting voice. She did not know what surprised her most: this new world that had been revealed to her or the growing interest that she had discovered in herself. It didn't

> matter. Walking home that day, something had changed. She had changed.
>
> (Masschelein and Simons, 2015: 42)

Different subjects each provide their own insight into different realms of human experience (Phenix 1964), each opening the child's eyes to a new world. We can categorise knowledge into mathematics, languages, natural science, social sciences and arts. **Mathematics** is a fully abstract discipline that exists independently of the outside world in that its objects of study are logical propositions rather than natural or subjective phenomena. Learning mathematics involves the acquisition of its forms, methods and theorems. The discipline is governed by internal logical consistency and precision. Despite its abstract nature, mathematics has the potential to explain multiple real world phenomena, such as weather patterns, the behaviour of materials or trade. **Language** has several purposes, communication being its predominant social function. Halliday (1973) describes the various developmental stages of language acquisition. Initially, spoken language in the mother tongue is acquired largely through immersion, which includes the range of familial and personal relationships of primary socialisation.

Schooling, however, requires introducing pupils to a more formal use of language, both orally and in terms of reading and writing. This linguistic 'break' from the automaticity of everyday communicative language facilitates pupils' ability to work in disciplinary knowledge-based subjects, which have their own, more specialised vocabularies. In this sense, mathematics can be understood as a language necessary for working in the natural sciences, and physics in particular. Later on, pupils can be introduced to one or more foreign languages, such that they learn to communicate with people from other nations and to deepen their knowledge of how language works.

It is worth saying something about why we decided to focus on English literature, rather than *Language*. As the book is concerned primarily with the secondary curriculum, it is here where the emphasis shifts to learning language in a literary context. At secondary level, arguably (and this remains a contested issue), the purpose is to introduce pupils to the more sophisticated and complex language found in literature. The danger of a preoccupation with the technical aspects of language was recognised in the early twentieth century by the authors of the Hadow Report:

> If some of the children in the end could recite whole pages, they had too often neither enriched their own powers of expression, nor caught the spirit of the books which they read, nor even mastered the information which the authors sought to convey. (HMSO, 1928: xvi-xvii)

In our view, the emphasis on literacy in its most technical definition continues to exert a strong influence on national educational policies, largely due to the prevalence of the generic standards of international comparison (of which PISA is the most well-known). These comparisons enjoy a relatively high level of trust among official and some professional circles. So, although the National Literacy Strategy, introduced by the Labour government in 1997, stands largely discredited, a somewhat technical model of English language as an accretive, linear process of recognising, and manipulating, linguistic and grammatical rules lives on. On the other hand, often in reaction to this over-technical approach, critics propose a more child-centred view of learning English language (Doddington and Hilton, 2007). Both approaches, in our view, miss the potential of English as an aesthetic subject. The predominance of models of literacy-as-technique on the one hand, or literacy-as-spontaneous-personal response, on the other, requires a counterbalance at the very least. To this end, we

decided to focus on English literature, which, as argued in Chapter Eight, subsumes simpler forms of reading and writing.

The **Natural sciences** are concerned with matters of fact, moving from description to explanation. The physical sciences (physics, chemistry, geology) aim for physical measurement of the world. Knowledge takes the form of propositions, sometimes expressed in mathematical form. Nevertheless, data is only the means to greater ends: the establishment of generalisations, laws and theories that explain natural phenomena. The aim is to bring order and intelligibility from apparent disorder. Biology is concerned with living matter or organisms. Biologists aim to identify patterns of organisation of living things and to understand how they came into being.

The **social sciences** (history, geography, psychology, sociology, political science, economics, anthropology, philosophy and religious education) are concerned with human behaviour. While in the natural sciences concepts relate to real world objects, the objects of study in the social sciences are social constructs (although physical geography draws upon the natural sciences). The aim in the social sciences is also to move from description to explanation, establishing generalisations and laws that simplify the human world. Some social sciences, such as history, geography and religious education, have an integrative function, where the purpose is to synthesise meaning from different realms. In religious education, for example, knowledge of beliefs, traditions and practices is drawn from both the past and the present.

The **arts** present a unique problem for epistemology, and therefore, ultimately, for their recontextualisation as school subjects. Unlike other disciplines, their object of study – the phenomenon which has to be reconstructed and objectified as knowledge – is the perceptual, emotional and imaginative apparatus of human subjectivity (Cassirer, 1979; Langer, 1961). This is a very different sort of object to those upon which scientific, and social scientific,

knowledge is constructed. While social realist epistemology provides important theoretical insights and language for describing knowledge, a theory of knowledge in the arts requires a broader theoretical grounding to find principles of objectification, and forms of evaluative criteria better suited to their epistemological identity.

During the twentieth century, work on the philosophy of language, anthropology and socio-aesthetics furnishes intellectual material from which Kantian aesthetics can be re-considered in ways which point to the foundational place of aesthetics in philosophical discussions of freedom. Cassirer and Langer (op. cit.) argue that objective knowledge in the arts is not arrived at by starting with conceptual or propositional analysis alone: rather it is in considering the particular, singular form of each work. It is its uniqueness and its wholeness that is of interest, and the extent to which a work can prompt a range of responses from which more complex and nuanced interpretations can be constructed, and justified. In art history, Claire Bishop argues against a widespread idea that considering aesthetics encourages a passive, individualistic understanding of, and attitude towards, art objects. Through an analysis of examples of contemporary art, she argues that the post-modern promise of greater emancipation through relational art, which proclaims its commitment to popular social issues, is not justified. Moreover, she suggests rejecting aesthetic criteria also entails rejecting a conceptualisation of the view as an independent, thinking being as he or she is interpolated as a participant in an encounter whose meaning are predefined. Her ideas, along with work in other fields, notably, Jacques Rancière in social theory and Linda Zerilli in political philosophy, suggest that the aesthetic need no longer be tied to conservative political views.

These fresh perspectives on the aesthetic are, unfortunately, remarkably absent from discussions within education or about the curriculum. Here, unfortunately, the view of aesthetics as something inherently elitist, or as a marker with which to exclude particular social groups, prevails. Left with this largely politically motivated, under-theorised definition

of the aesthetic in education, the arts have been particularly vulnerable to extrinsic, instrumental justifications. Instrumental justifications for knowledge, ultimately, contribute to shaping school subjects in ways which can distort their inner epistemological features. Examples of this effect can be seen in the current GCSE Art curriculum as evidenced in official assessment and curricular documents (Cunliffe, 2010; Sehgal Cuthbert, 2014) and in GCSE English Literature (Sehgal Cuthbert, unpublished thesis). Most importantly, for educators concerned with universal access to better knowledge in a *general, epistemologically balanced* curriculum, this situation means that aesthetic forms of knowledge are restricted to a minority of the younger generation, as at the present moment, English literature and art remain optional subjects at GCSE.

Schools (alongside the family, the community and religion) also induct children into moral norms of behaviour. In the curriculum, knowledge about **morality** is not usually taught as a stand-alone subject, but is introduced to pupils through religious education, history, philosophy, psychology and literature. The essence of ethics is right deliberate action. While sciences are concerned with facts (what is), ethics involve deliberation of what is 'good' or 'right' (what ought to be). The language of morality is not specialised because ethical actions are part of everyday life and often common sense. While we can make use of general, abstract moral principles decisions are made in concrete existential situations, which need to be considered in their particularity. Oftentimes, we learn morality from common norms and laws or other formal codes, as with religion. Ethics can also be learnt from lived and imagined stories in history and literature.

It is not the purpose of this book to prescribe a curriculum for schools. Rather we are seeking to examine the importance of disciplinary knowledge in the curriculum. The chapters we have selected for this purpose are illustrative rather than expansive. Nevertheless, in each of the following chapters the nature of a particular area of disciplinary knowledge is explored,

including how it is re-contextualised in the school curriculum and what implications this has for teaching the subject.

At this point we should acknowledge the cultural and temporal specificity of the curriculum: different societies will shape the content of the curriculum as they see fit. Historically, the emphasis in the curriculum has varied between moral, aesthetic and epistemological aims (Young and Muller, 2016). If schools are for developing the minds of children, we surely want the curriculum to introduce them to a broad range of human experiences and knowledge, but especially those that develop intellectual capability, foresight and imagination.

School subjects are clearly related to the disciplines from which they derive, but they can differ due to the different pressures on schools and a greater array of aims. With subjects like history, geography, English literature and religion, the curriculum will reflect national and sometimes local context – which are the important places, people, stories and literature specific to this location. Subjects like citizenship or social studies (in the USA) reflect larger political priorities for promoting democracy and/or integrating immigrant populations.

The relationship between disciplinary knowledge and subject knowledge is one of re-packaging, or as Bernstein (2000) preferred: *re-contextualisation*, within two spheres: the *official* recontextualising discourse (politicians, policy makers, exam boards), and the *professional* recontextualising discourse (teachers' organisations, professional bodies, subject associations). It is from within the interplay of discourses operating within each sphere that teachers and curriculum advisors must make decisions about which aspects of disciplinary knowledge to include in the curriculum, how they should be presented and how the knowledge and skills can be best structured to allow pupils to make progress in the subject. When children are being introduced to subjects the messiness of disciplinary debates and

divides is best hidden. In the earlier stages of learning, pupils need a simple and coherent presentation of what a subject is and how it works. Those shaping the curriculum and teachers need to present the subject in a coherent fashion. As with disciplines, subjects need a clear *purpose, object of study, organising concepts, a structured framework of knowledge,* and *methods and modes of enquiry or practice*. While in universities these are likely to be expansive and varied, in order for the subject to be communicable to children, schools need tighter and more logically coherent criteria for selecting knowledge, as well as pedagogic principles for teaching. It is only from such a foundation that young people can *later* be introduced to the complexities of intellectual debates and more diverse ways of thinking within or even across disciplines.

Decisions about the content and structure of the curriculum and subjects take place at different levels. Subject-specific curriculum specialists advise government, examination boards, subject associations and examinations boards. This role of one of re-contextualising or re-packaging disciplinary knowledge into a form and structure that is informed by pedagogical principles and the logic of the epistemological framework of the discipline. The job of individual subject departments in schools is to interpret the national curriculum, decide which examination board to follow and select from the resources available for teachers. Departments will produce their own schemes of work designed to enable pupils to advance and deepen their knowledge, understanding and skills in the subject. Individual teachers play a constructive part in shaping the subject curriculum, selecting the content of study and the methods of teaching.

Subjects comprise of *propositional (conceptual) knowledge, procedural knowledge* (methods and modes of enquiry or practice) and *contextual (factual) knowledge*. Concepts, as generations and abstractions, are a means for simplifying a complex reality by sorting things into categories. Concepts are human constructions and thus potentially fallible. Yet, without

them it would be impossible to make sense of the disordered reality that we experience at the level of perception. Russian psychologist Lev Vygotsky was well-attuned to their importance: 'with the help of the concept, we are able to penetrate through the external appearance of phenomena to penetrate into their essence' (cited in Derry, 2013). However, concepts do not appear to us in isolation and many are not necessarily easy to intuit. Rather we develop concepts in relation to other concepts: mother-child, light-dark, urban-rural, eustatic-isostatic and our understanding of them deepens over time. That each new concept is inferred from existing concepts has important pedagogical implications for the classroom, and is explored further in the work of Robert Brandom (2000). In fact, we develop whole systems of concepts for making sense of different aspects of human experience. As Michael Young observes, 'Subjects bring together 'objects of thought' as systematically related sets of concepts' (2014: 98). As such, adds Young, they are the most reliable means we have of making sense of the world.

Procedural knowledge means the methods by which those in the particular field test and verify theories and ultimately establish new knowledge. In inducting children into humanity's intellectual traditions, we don't just want them to learn knowledge as something given, but we want pupils to understand knowledge as a product of social activity. This means learning something about the evolution of knowledge over generations, how it was constructed and by whom. Pupils need to learn the methods and modes of enquiry taken by each discipline (again in simplified form). Knowledge by acquaintance or example could be said to fall under this category. It has a particularly large rôle in aesthetic subjects where each work comprises an artistic unity, and generalisation is achievable more by iterative interpretation than by application of concepts over a range of discrete phenomena. As pupils are introduced to a purposively selected range of exemplary works, their interpretative faculties are honed; and

they become more adept at making heuristic interpretations. These initial interpretations need to be rationally justified, *post hoc*, through analysis and comparison of a work's artistic form.

In this light, a broad and balanced curriculum during the stage of compulsory schooling, with representatives from the different forms of knowledge – the sciences, social sciences (or humanities depending on which disciplinary perspectives are emphasised), and the arts – is more than a rhetorical nicety. It provides the means through which pupils develop not only conceptual understanding, but also the skills and habits of intellectual enquiry, such as observation, research, data collection, measurement, precision, analysis, evaluation, interpretation and creativity within the discipline.

Although it is possible to outline many beneficial outcomes of education we maintain that to tie education to specific extrinsic ends runs counter to its exploratory and scholastic nature. School subjects then are a way of inducting children into the intellectual habits of humankind, and hence into a disciplinary conversation about knowing our world. Like disciplines, subjects enable the child to transcend the semantic limitations of personal experience and everyday knowledge. They help children to see further and to potentially find their own niche in the world.

As pupils are inducted into different fields of specialist knowledge and their 'intellectual and moral habits' (Pring, 2013), it changes them. Education is more than gaining clarity of understanding. As children begin to internalise knowledge and intellectual habits from the teacher 'the self of the student takes form' (Masschelein and Simons, 2015: 55). Education involves commitment and volition on the part of the child because learning subject knowledge and techniques are challenging. Over time, pupils begin to internalise values associated with intellectual demands including 'devotion, respect, attention and passion' (*ibid.:* 68). Mimicking the teacher, pupils begin to identify with certain disciplines that they

are drawn to or excel at, thus making their '*debut dans la vie humaine*' (Oakeshott cited in Fuller, 1989: 39). Through an introduction to the diversity of human experiences and ways of thinking, children also learn to respect and appreciate different ways of thinking. This is why schools need teachers who are well-versed in disciplinary knowledge. Through teaching subjects, they are helping children to explore their own humanity and to develop an understanding and appreciation for a plurality of human experiences.

Endnotes

1. See interview of Jacques Rancière with Mark Foster Gage at: www.youtube.com/watch?v=w4RP87XN-dI (accessed 20 April 2017).

2. See Claire Bishop's Antagonism and Relational Aesthetics at: www.teamgal.com/production/1701/SS04October.pdf (accessed 20 April 2017).

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