

## The curriculum and subject knowledge

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Before I came to the IOE in January 2001, I knew only the members of the science education team and, by reputation, a handful of other academics, including Peter Aggleton, Gunther Kress, John White and Geoff Whitty. For many years John and I hardly spoke to one another (the IOE is a large place and we are in different departments) and then back in 2009 for some reason we had lunch together. Considering that one of us is a leading philosopher of education and an active member of the British Humanist Association and the other a science educator and a Priest in the Church of England we got on extremely well. We found ourselves in agreement that atheism should be taught properly in schools and immediately wrote a short piece together (Reiss & White, 2009). That might have been the extent of our collaboration but two and a half years later John e-mailed me:

... I don't know if you would be interested in co-authoring a piece of around 20-25K words, perhaps to be submitted to IOE for possible publication, on <The Aims-based Curriculum>? I've written a lot of it already, around 15K, but it is still unpolished stuff, and needs much more doing to it. I'm particularly incapable on matters to do with science and mathematics and would welcome your help on this. But the whole thing would benefit by co-writing, so as to make the argument less subjective and give it more weight ... (E-mail to M Reiss, 21 December 2011)

I responded enthusiastically and the result was Reiss and White (2013). I consider myself extremely fortunate. Not only have I enjoyed and learnt a great deal from our co-authorship, but it has helped push me into broader issues than those on which I usually write, which is good for me.

### **Towards a Compulsory Curriculum**

John's first book, *Towards a Compulsory Curriculum*, was published in 1973 (White, 1973). In it he advanced a number of arguments that he then developed over the next forty years. I'll explore some of the developments of the major themes in his writings below but in this book, which preceded the National Curriculum in England and Wales by some 16 years, there is a central presumption – the point is hardly argued – that education must be for the benefit of individual learners and take them as its starting point:

It is at this point that notions of a 'child-centred' education and an 'integrated' education meet: the child must be at the centre of all he learns; education cannot be 'subject-centred' in this sense. (White, 1973, p.51)

This presumption, which seems to me entirely correct, of the fundamental requirement for education to be child-centred in the true sense of the term (by true, I mean that child-centredness does not, for instance, entirely equate with acceding all control of children's education to them – something that would be as wise as allowing children repeatedly to hit younger siblings, should they so wish) leads to a number of related points being made. These points are of particular significance when constructing a compulsory curriculum, and yet have been consistently overlooked since England introduced a compulsory (national) curriculum. First, adopting a Millian perspective, White argues: "it would be right to constrain a child to learn such and such only if (a) he is likely to be harmed if he does not do so, or (b) other people are likely to be harmed" (White, 1973, p.6). Secondly, and relatedly: "It follows from the insistence on the principles of liberty in this essay that the presumption is that the pupil should be obliged to study as little as possible" (White, 1973, p.67). This latter point allows John to espouse a curriculum in which a high proportion of the curriculum is voluntary, and his interest in matters Russian (Crace, 2006) shows in his enthusiasm for the Young Pioneer movement in eastern Europe where compulsory education takes place in the morning with children "left free in the afternoon to join, if they want to, the various Pioneer 'circles' or groups, organized either on the school premises or in Pioneer Houses and Palaces serving several schools" (White, 1973, p.70).

Education is also, of course, about far more than the acquisition of knowledge about particular subjects. One point stressed in *Towards a Compulsory Curriculum*, in addition to the issue of how one integrates knowledge across subjects, is that pupils "should finish their education with an understanding of the many different ways of life which they and others may pursue" (White, 1973, pp.43-4). Admitting that there is "something unsatisfactory about laying down a list of the guiding principles embodied in ways of life" (p.44), John goes on to present "the following list as a rough attempt to outline some of these differences" (p.44):

1. A way of life devoted to the pursuit of truth, in science, history, etc.
2. A way of life devoted to artistic creativity.
3. A way of life devoted to others' good: the altruistic way of life.
4. A way of life devoted to physical prowess or adventure.
5. A way of life devoted to physical pleasures more broadly understood, including those of food, drink and sex.
6. A religious way of life, premised on the belief that this life is only a preparation for an after-life.
7. A life devoted to the acquisition of goods.
8. A life devoted to the acquisition of power over others.
9. A way of life devoted to reflection on how one should live.
10. A way of life devoted to domesticity.
11. A way of life devoted to public affairs.
12. The ascetic way of life.
13. A way of life based on a Thoreauesque return to nature.

14. A way of life based on one's surrendering to someone else the decisions about what sort of life one should lead. (White, 1973, p.44)

Now, it might be held that such a list is fraught with potential problems. I am unaware, for example, of any religion that holds that this life is only a preparation for an after-life. More generally, are these ways of life mutually exclusive? (No, though there are limits to the number of one's devotions and bases.) Is there an implied hierarchy amongst them? (To some extent; for instance, 11 can be construed as a subset of 3. In any event, some are clearly easier to defend than others.) Is there an over-arching moral framework in the background of this analysis? (Yes; by and large, one's life is better if one examines it on occasion, while lives differ in their effects on others.) The point that is being made here is surely a convincing one: too often, formal education fails to enable learners to reflect on why they do what they do or to consider who they want to be. Some such reflection and consideration, of course, can be achieved by each of us through our own efforts, helped by the influences of family and friends. But schools have a particular role to play here, a role that they too often abdicate.

A further argument advanced in *Towards a Compulsory Curriculum*, in a way that goes beyond the 'forms of knowledge' of Hirst (1965), and others, is that not all school subjects are of equal worth. This argument connects with the above question of whether all ways of life are of equal worth. In contradistinction to the assumptions of recent UK governments – motivated primarily by a naive set of beliefs about the importance of home-grown science, technology, engineering and mathematics talent for economic growth – John argues that “The humanities have a more central role in the curriculum than the natural sciences ... because they alone enable one to weave together a human life” (White, 1973, p.63). In a way I find personally chastening, given that from the age of 14 at my secondary school I studied only physics, chemistry and mathematics, the point is pushed home forcefully:

Suppose we take two secondary-age pupils who, after a broad primary education, specialize for a few years, one in physics, chemistry and mathematics, the other in literature, history and, later, philosophy. Suppose, too, that they never study anything except their specialisms. The humanist would be inadequately educated. He could well have a good appreciation of the larger bearings of life – of a variety of different ways of life open to him, of the moral considerations in these choices, of the need to integrate his life into a meaningful whole; he would also have some understanding of some particular activities he could pursue for intrinsic or extrinsic reasons; but he would lack an understanding of mathematics and physics and other activities dependent on these, and to this extent his options would be limited. But the scientist would not even be inadequately educated: he could scarcely be said to be educated at all. He would be a man without any general orientation to his life, apart from what he might pick up unreflectingly from his environment – at best, a specialist of genius but trapped within his discipline; at worst, a sophisticated serf. (White, 1973, p.63)

It would be relatively easy to critique this argument. Are not all of us trapped within our disciplines? Is it really the case that generations of students who have specialised in the sciences at secondary school can “scarcely be said to be educated at all”? After all, in his famous Rede lecture, based on a sample size of some thirty thousand to forty thousand interviews, C. P. Snow painted a picture of such individuals as far more likely to try to acquaint themselves with music and literature than their arts- and humanities-based equivalents were to try to acquaint themselves with mathematics and science. As Snow concluded, speaking of these non-scientists: “But what about the other side? They are impoverished too—perhaps more seriously, because they are vainer about it” (Snow, 1959). I am inclined to be generous to John in his use of the above argument. Feyerabend has always been my favourite philosopher of science, not least because of his intentional use of hyperbole as a powerful communications device.

### **The aims of the curriculum**

As indicated above, the central premise that education should serve to benefit each learner was present in John’s first published book. Fuller treatments as to the aims of education followed, including a 1996 booklet titled *The Aims of School Education*, published by the Institute for Public Policy Research (White, 1996). In its 14 pages, possible national aims for the school curriculum are advanced and suggestions are made as to how the journey from aims to curriculum might be traversed.

A further development of what a school curriculum might look like if one were to begin with aims rather than subjects is presented in some of John’s most recent writing, notably *An Aims-based Curriculum* (Reiss & White, 2013). Here the argument begins with the premise that the aim of the school curriculum is two-fold: to lead each learner to lead a life that is personally flourishing; and to help others to do so, too. (Reasons for this fundamental premise are explored in the section below on ‘Well-being’.) Granted this assumption, a central aim of a school should therefore be to prepare students for a life of autonomous, whole-hearted and successful engagement in worthwhile relationships, activities and experiences. With many of these – cooperative work activity, friendships and enjoying literature, for instance – it makes good sense to see that students gain first-hand experience. For others – things like mountaineering, composing symphonies, choosing to live an unmarried life, running a multinational company – imagined rather than direct involvement is likely to be more appropriate, for a range of self-evident reasons. This aim also involves acquainting students with a wide range of possible options from which to choose. With their development towards autonomous adulthood in mind, schools should provide students with increasing opportunities to decide between the pursuits that best suit them. Young children are likely to need greater guidance from their teachers, just as they do from their parents. Part of the function of schooling, and indeed parenting, is to prepare children for the time when they will need to, and be able to, make decisions more independently.

We want children to want other people, as well as themselves, to lead fulfilling lives. Negatively, this means not hurting them, not lying to them, not breaking one's word or in other ways impeding them in this. Positively, it means helping them to reach their goals, respecting their autonomy and being fair, friendly and cooperative in one's dealings with them. Schools can reinforce and extend what parents and others in families do in developing morality in children. Schools can widen students' moral sensitivity beyond the domestic circle to those in other communities, locally, nationally and globally. They can also help them to think about moral conflicts in their own lives and in the wider spheres just mentioned. They can encourage students to reflect on the basis of morality, including whether this is religious or non-religious.

As part of their moral education, schools should help students to become informed and active citizens of a liberal democratic society. Dispositionally, this means encouraging them to take an interest in political affairs at local, national and global levels from the standpoint of a concern for the general good, and to do this with due regard to the values of a liberal democracy such as freedom, individual autonomy, equal consideration and cooperation. Young people also need to possess whatever sorts of understanding these dispositions entail, for example an understanding of the nature of liberal democracy in general, of divergences of opinion about it, and of its application to the circumstances of their own society.

As future citizens, the great majority of students will contribute to the general well-being, as well as to their own, through work. This will often be remunerated, though much of it, e.g. caring for children or elderly relatives, may not be. As autonomous beings, students will eventually have to make choices about what kind of work to engage in. Schools should be helping them in this by making them aware of a wide range of vocational possibilities and routes into them, as well as their advantages and disadvantages. This is a particularly important function of schools as this is something that few parents can provide for their children.

The rest of Reiss and White (2013) builds on this argument. In some places the conclusions may be considered somewhat radical; in others they seem quite conventional. For example, we conclude that in the UK, school children should acquire some understanding of:

- the change from an agrarian to an industrial society, based first on steam and then on other sources of power
- the rise and fall of the British Empire
- the increase in population and rise of urbanization
- the change from monarchical/aristocratic to democratic government and the rise of liberalism
- changes in the occupational and class structures and their reflection in political changes
- changes in social welfare provision.
- international conflict and moves towards cooperation in Europe and globally

- USA superpower status and the recent rise of newly powerful and rapidly developing economies
- divisions between rich and poor countries
- the spread of democratization and challenges to this
- the depletion of resources and issues of sustainability. (Reiss & White, 2013, p32)

This is not a very startling list of suggestions. However, it follows from first principles (the two fundamental aims of education) rather than simply deriving from existing history and citizenship curricula. Whether the conclusions are seen as far reaching or straightforward, the intention behind *An Aims-based Curriculum* is to provide a framework for the development of a coherent set of aims for the curriculum, some for implementation at national level, others at the level of each school.

## Mathematics

In virtually all countries, two subjects enjoy especially privileged status in the school curriculum: the national language and mathematics. Few would argue against the high status accorded to a country's national language, but why is mathematics held in such universally high regard? In *Why Learn Mathematics?*, Steve Bramall and John White, along with the authors in this edited volume, attempt to answer this question. As one might expect, given John's earlier characterisation of the worth of an education with too great a focus on mathematics and the physical sciences, the editors do not pull their punches. However, again typically of John, balance is provided, with almost half the authors being mathematics educators, teachers or, in one case, an advanced level student then applying to universities to read a mathematics-related subject.

John's own position is most fully worked out in his own chapter in Bramall and White (2000). He asks whether the study of mathematics should be compulsory for all in schools until the age of 16 (at the time, the school-leaving age). He begins by noting that parents, governors and employers all see mathematics and English as the two most important subjects in the curriculum. He goes on to identify two main groups of arguments for the study of school mathematics: one instrumental (i.e. the harnessing of mathematics to the demands of everyday life and the economy), the other non-instrumental (e.g. mathematics as intrinsically interesting).

John begins with the non-instrumental arguments and quotes Fred Clarke, a former Director of the IOE, who wrote that "the ultimate reason for teaching long division to little Jonny is that he is an immortal soul" (Clarke, 1923, p2). However, John argues:

Few of us living in a more secular age could go along with the religious assumptions in this. Yet many more of us are insensibly influenced by other aspects of the Platonic-Cartesian theory. Especially the notion that mathematical thinking is in some way superior to other forms of thinking – both academic forms like those of the historian or literary critic, and the

practical reasoning on which we rely day-to-day in the planning of our personal and institutional lives. (White, 2000, p.72)

In the *Republic* the philosopher kings study mathematics for ten years to help equip them for their role. John, though, concludes that “It is a myth, then, that if we want to develop young people’s minds, one of the best ways of doing this is to give them a rigorous training in mathematics” (p.73). (In passing, we can note that comparable arguments are sometimes offered for the teaching of certain other subjects including Latin and philosophy, and even chess.) Learning mathematics makes you better at mathematics and subjects that use mathematics, such as physics and economics, but there is no evidence that it makes you better at anything else. John is also unenthusiastic about the possibility that learning mathematics gives one, except in its role as a handmaiden to science, a key to understanding the fundamental realities of the universe.

John then turns to more successful non-instrumental reasons for studying mathematics and identifies three: the intrinsic delight in mathematical thinking that “many” (John is generous here) have experienced in proving, for example, that the square root of 2 is irrational; the necessary role of mathematics within science, taken as intrinsically interesting apart from its technology implications; the place of mathematics as an achievement of human culture. However, these three reasons, even if granted, do not show that mathematics must be taught right up to the age at which one can leave school. John concludes:

These considerations point towards a compulsory taster course in mathematics after the age of 11 rather than a compulsory five-year course. This would enable those who don’t already have an inclination for it to see if one develops. If they find no hint of joy in it despite the taster course, it would be sensible to let them drop it. After all, there are plenty of alternatives among which they might find something more appealing. Beyond the taster courses, there would be voluntary courses, perhaps within some constrained option system, for those who like the subject. If teaching on the taster course has been sufficiently inspiring, one may expect many, perhaps most children to want to take the subject further, but it would be unrealistic to expect everyone to do so. (White, 2000, p76)

Discussion then turns to the instrumental reasons. Three potentially sound ones are identified:

- a) It is a commonplace that we all need some understanding of simple arithmetic to manage our personal finances, measure areas around the house, etc. How much we need, especially in the age of the calculator, is a further question. Even before calculators came on the scene, most adults had little cause to tap into their knowledge of long division or long multiplication or square roots.
- b) We also need some mathematics from a civic point of view. We have to be able to think in terms of millions and billions in order to grasp anything of

national housekeeping; we need to understand graphical and other representations of quantitative data on policy matters such as are found in the media; we need some insight into how such statistics can be misleadingly presented.

c) Mathematics is a *sine qua non* of very many jobs. (White, 2000, p79)

With reference to these instrumental reasons, John again concludes that they do not furnish a good argument for compulsory mathematics up to age 16. Perhaps somewhat optimistically, he holds that the mathematics needed in respect of argument (a) should mostly be attained by the end of primary school. The mathematics to satisfy the requirements of argument (b) should be provided by a short, focused compulsory course at secondary level, preferably tied in with courses in education for citizenship. With respect to argument (c), “Rather than thinking of pre-equipping students for vocational possibilities, we should ensure that they can take up voluntary courses in requisite subjects once their vocational preferences are clear” (p.80).

## Well-being

As we have seen, John has always put the interest of the learner at the heart of his curriculum philosophy. These ideas are brought together in the recent *Exploring well-being in schools* (White, 2011a), where well-being is taken as being synonymous with fulfillment and flourishing. The book begins by looking at the recent upsurge of interest in well-being and then goes on to examine what precisely well-being entails. Here, the considerable diversity of possible answers is noted. For a start, there is the fundamental, though rarely asked question, of whether this life is all there is or whether there is also a life to come. The answer proposed – the correct one it seems to me – is that children “should be encouraged to make up their own minds about the possibility of life after death” (p.18). After a section on religious conceptions of well-being, we are taken through accounts of utilitarianism followed by needs satisfaction, the attainment of positional goods (such as fame and large amounts of money) and desire satisfaction. As an illustration of how enjoyable it can be to read John’s writing, here is his exemplification of Mill’s as opposed to Bentham’s version of utilitarianism: “If you think sipping a pina colada on a balcony in Tobago is what it is all about, you are plain wrong. You would do better going inside, opening up your laptop and starting your next critical article on Flaubert” (p.21).

John concludes that:

A flourishing life is one filled with successful and whole-hearted engagement in worthwhile activities and relationships. It has to be, on the whole, *successful*, since repeated failure in our projects and liaisons clearly detracts from our well-being. It has to be *whole-hearted* because, again, it is hard to see how dragging ourselves through even the most valuable pursuits in a tired, listless, merely dutiful or uncommitted way can make our life go well. What counts as *worthwhile* is partly dependent on our biology: We would not



prize sexual intimacy if we reproduced, amoeba-like, by fission. But it is mainly a cultural matter.

...

Several misconceptions need defusing. A flourishing life is not to be identified with a pleasurable one, or with a life in which one succeeds in satisfying one's major informed desires. This casts doubt on links often made between well-being and wealth, celebrity or positional goods. Secondly, in order to flourish, we do not need to have our own flourishing as a goal. (pp.113-4)

It is worth emphasising that John sees schooling as a natural extension of parenting. He presents a fictional account of a young girl called Willow, that begins with her envelopment into close, loving relationships as soon as she is born. Progressing through her parents' delight at her participation in early games such as peek-a-boo, she develops to the point where:

Parents and carers help her to make sense of the world around her. They encourage her delight at frogs, furry caterpillars and other joys of the natural world. They play imaginative games with her, develop her nascent sense of humour. And all the time they are shaping the kind of person she is, getting her to be self-confident, self-reliant, patient and helpful to other people. They let her know that she cannot always get her way, keep her from too much inappropriate food or drink and do not make a fuss over little knocks and falls. (pp.124-5)

Home and school alike are seen as helping children to live abundantly and helping others to do so too. Unsurprisingly, there is a call for less of a gap between teachers and parents, for class sizes to be smaller and for the development of dispositions to be given more weight in schools: "The starting point is that she should have the positive qualities needed for a flourishing life. We would not want her to become brilliant at algebra and Latin, but also cripplingly anxious, or cynical, or a sadist" (p.131).

### **Curriculum history**

2011 was a particularly productive year for John. In addition to the publication of *Exploring well-being in schools* (White, 2011a), *The invention of the secondary curriculum* (White, 2011b) appeared. Many would not think of John as an academic historian but he has a history degree and *The invention of the secondary curriculum* was awarded second prize by the Society for Educational Studies for the best book on education published that year. It provides a compelling narrative, attempting to explain how we have ended up with the curriculum we have in Britain and many other countries.

The origins of today's school curricula are seen in the second half of the sixteenth century when Petrus Ramus (aka Pierre de la Ramée) successfully argued that material to be taught in schools and universities should be universally true (thus excluding epistemologically dubious material as well as material requiring an aesthetic response), grouped together so as to avoid overlaps between subjects and presented from the most general definition through increasing levels of specificity. John admits that historical causation is complex but argues that Ramus' influence persists to this day. Ramus was also a great believer in hard work – his personal motto was *Labor omnia vincit* – and textbooks.

Ramus and his immediate successors did not have everything their own way with their anti-scholastic philosophy but they did have some major early successes, notably in Scotland where first Glasgow University and then the universities of St Andrews and Aberdeen and the town college of Edinburgh re-ordered their curriculum along the lines they proposed. For example, in 1641 King's College, Aberdeen had a year 1 curriculum that consisted mainly of Greek and Hebrew, a year 2 one of logic, rhetoric and mathematics, a year 3 one of ethics, politics and economics and a year 4 one of natural philosophy, which included astronomy, geography, optics and music.

A whole cast of influences led to further developments in the curricula of both schools and universities over the next two centuries. Of particular importance in England was the foundation of London University, later University College London (UCL), in 1826. London University was originally conceived as a Dissenting University, given the exclusion, until the 1870s, of English dissenters from Oxford and Cambridge. Unlike Oxford and Cambridge, the new university's four-year general course was lecture-based and had considerable similarities with the Scottish curricula that had arisen two centuries earlier. Latin, Greek and mathematics were covered in years 1 and 2, logic, philosophy of mind, chemistry and natural philosophy in year 3, and jurisprudence, political economy, natural philosophy, moral philosophy and political philosophy in year 4.

London University's curricular pattern soon began to spread to younger age groups. In 1838 the London matriculation exam was introduced as a precondition of taking a London degree. The subjects were mathematics, natural philosophy, chemistry, Greek, Latin, English language, history, geography and natural history. This examination was soon used for other institutions such as Owens College, Manchester and other colleges with dissenting connections. Soon too it was being used not only for potential university entrants but more broadly.

By the end of the nineteenth century what can be termed a comprehensive curriculum based on a range of discrete subjects was becoming widely established in British secondary schools. Such a school curriculum also featured in an increasing number of other countries, particularly those where Protestantism was strong or where colonial links to such countries were close. A subject-based curriculum remained at the heart of the grammar school system that flourished after the 1945 introduction of the tripartite system of secondary education and such an

arrangement was buttressed by the academic arguments about the nature of knowledge of Phenix (1964), Peters (1966) and, above all, Hirst (1965).

Furthermore, for all that the twentieth century showed great changes in school organisation and in certain aspects of pedagogy (including the use of IT), remarkably few changes happened with regard to the curriculum. John had already pointed out (White, 1990) that Hitler or Stalin would not have objected to the solitary statement in England's 1988 National Curriculum as to its purpose, namely that it must be a balanced and broadly-based curriculum that: (a) promotes the spiritual, moral, cultural, mental and physical development of pupils at the school and of society; (b) prepares such pupils for the opportunities, responsibilities and experiences of adult life. Furthermore:

... speaking of Stalin, it is instructive to see what kind of national curriculum *he* had. Leaving out tiny inputs on the USSR Constitution, astronomy and psychology, it consisted of: language and literature, mathematics, history, geography, the sciences of biology, physics and chemistry, a foreign language, physical education, drawing, singing and practical work in agriculture or industry. The list is almost identical to Mr Baker's ten foundation subjects. Not only that, three of Stalin's items were classified as 'important subjects' – language, mathematics and science. Today we call these 'core subjects'. Detailed syllabuses for every subject mentioned, covering the ten years of compulsory education, were laid down rigidly from the centre.

It might be argued that the considerable similarities between curricula worldwide – because these extend beyond England and the former USSR – suggest there is a validity in such collections of subjects. I think John's response would be that such aggregations are in large measure the result of an uncritical acceptance of historical legacies and that this is holding back schools from providing the better education that they could.

## **Conclusion**

In his writings, John has consistently advocated that the curriculum be designed and implemented for the needs of learners. Indeed, the volume of his selected writings in the prestigious World Library of Educationalists series is titled *The Curriculum and the Child* (White, 2005). Of course, there is more to education than the curriculum, but by maintaining a consistent approach to the question of why we have the curricula we have and how they might be better constructed, John has brought a conceptual rigour to curriculum studies, proceeding analytically but also engaging with normative issues, while writing in a way that connects with policy makers and teachers too. I'll end with the paragraph with which he began his Introduction to *The Curriculum and the Child*:

It must have been the lack of coherence in my own schooling that first prompted me to think about the aims of education. What were all those bits and pieces of learning supposed to be about? Those four languages and their grammars. The courting habits of the earthworm. The Second Crusade. Attempting and failing to jump over the buck. That sixth form essay for the headmaster on 'Eating Onions' (his choice of title) ....

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