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**Textbooks Count**

The author has reviewed over 200 textbooks from a range of jurisdictions, including Singapore, Massachusetts, Hong Kong, England, and Finland. The study covered both Primary and Secondary phases. Mathematics was a particular focus. The paper will examine:

- the dimensions of difference between textbooks from these different settings
- the policy context in which textbook production and use is located
- the history of textbook production and use in the respective jurisdictions
- the dominant orthodoxy around textbooks
- aspects of underlying models and textbook quality

The analysis includes an overview of patterns of use, and offers explanation for the apparently low level of use of textbooks in the English setting. The relationship between textbooks and examinations has been an area of particular controversy in England, and was, in 2012, the subject of a House of Commons Select Committee inquiry. The debate around this enquiry highlighted the extent to which accountability arrangements (focussing specifically on examination outcomes) heavily conditioned the form of textbooks and their promotion amongst schools.

The paper will explore and compare the function of textbooks in curriculum control and restriction in different settings, and will examine their role in reform processes, with a specific focus on Finland.

# Textbooks Count

## Background to this paper

The first National Curriculum in England was introduced in 1988. Major review occurred in 1995, 1999, 2007 and 2009. In 2010, the UK Government announced a review of all elements of the National Curriculum for England. This followed a revision of the content of the secondary curriculum National Curriculum by the Qualifications & Curriculum Authority in 2007, and a review of the primary curriculum by Sir Jim Rose, completed in 2009, which, by 2010 had not yet been implemented. The 2010 review differed from those carried out in 1995, 1999, 2007 and 2009, in the following ways:

1

it included a more comprehensive consideration of the international evidence on relative performance. The Secretary of State recognized that whilst there was no sudden crisis in attainment standards, performance was stagnant in England, leading to England slipping down the top level 'league table' in PISA. This judgement of 'stagnation' was corroborated by key domestic measures (Hodgen, Brown, Coe & Kuchemann 2012; Shayer & Ginsberg 2009) as well as those from PISA, PIRLS and TIMSS (OECD 2010).

2

it included, for the first time, comprehensive international benchmarking of content standards in the national curricula of a range of high-performing jurisdictions, alongside domestic and international evidence on age-related 'learning progressions' in key subjects.

3

it included a commitment to increase the autonomy of schools in respect of curriculum development, distinguishing the National Curriculum (as central, evidence-driven statement of strictly limited requirements) and the School Curriculum (a rich and expansive contextualization of formal State requirement, combined with broader, non-statutory elements). This policy element derived from a general political commitment of the new Coalition Government to reduce the size and scope of State apparatus (ref), combined with OECD and related evidence on levels of autonomy in key jurisdictions, notably Finland. From the outset, the Review included comprehensive theorization of the role of different instruments and elements of 'curriculum control', including the role of textbooks (Oates T, 2010).

This commitment to more comprehensive examination of the international evidence on system improvement and system management originated in a number of concerns. Contrary to much domestic press comment (TES 2012; Telegraph 2013) it was not solely stimulated by the influence of the topline 'league table' produced by OECD.

The first concern was to refine the National Curriculum through insights from comparisons of school improvement strategies in differing jurisdictions. The assumption of the Review team was that this would enable examination of the form of national curricula in those systems which had enjoyed improvement. Consideration of the improvement strategies would contextualize variation in the form of these curriculum statements (expert panel report). The analytic views of 'school improvement' cover a vast spectrum of academic and political opinion, from Michael Barber's 'ideal type' analysis (Barber & Mourshed 2007) to Pasi Sahlberg's pejorative and critical GERM perspective (Sahlberg P 2013). Despite highly

polarized opinion about approach, it is clear that some systems have achieved sustained improvement, and not from a low base. In addition, the Review used balanced criteria to identify jurisdictions worthy of consideration – including improvements in attainment, improvements in equity, and improvements in enjoyment and engagement with learning (Oates 2010). Application of these criteria – yielded a list with a focus on Alberta, Singapore, Massachusetts, Hong Kong and Finland. While some jurisdictions were developing innovative and interesting national specifications (eg ACARA in Australia, SQA in Scotland), a further criterion relegated these to a second list, of jurisdictions of interest, but where it was not possible to relate empirically a period of proven improvement to the precise form of action and instruments involved in that period. In other words, such innovations – however well grounded and theorized – are as yet unproven. It would be wrong to ignore them, but equally wrong to assume that they are ineluctably ‘on the right path’. The ability to read across from periods of improvement to the precise form of the system at that time proved to be an important criterion, as the work on the role of textbooks in Finland will show, later in this paper.

The second concern was to resolve an apparent contradiction. Following its initial development in 1988, the National Curriculum in England had been revised in 1995, 1999 and 2007. The considerable detail of the original specification had been refined in the 1995 and 1999 revisions, but in 2007 a radical shift had occurred, to highly generic statements. The apparent contradiction was that some other jurisdictions also had adopted relatively generic descriptors in their national curriculum frameworks and this superficially could be seen to justify the drive to generic descriptors in England. But this does not take account of the role of more detailed requirements present in other systems through instruments such as mandated textbooks. In England, no such instruments were in place. In the event, the move to highly generic descriptors removed well-evidenced conceptually-rich content from the legal requirements placed on schools, in the absence of other means of securing such content.

Taking the example of science – with a reduction consistent with other curriculum subjects - in comparison with the 1999 curriculum, the reduction in the content in science in the 2007 specification was both considerable and stark:

**Science in the National Curriculum**  
 KS3 (age 11-14) & KS4 (age 14-16)

	N of statements of attainment KS3 & KS4	
1991 Original specification	96	139
1995 Dearing revision	166	221
1999 QCA-led revision	121	189
<b>2007 QCA-led revision</b>	<b>37</b>	<b>30</b>

## Science specification KS 3 1995

Materials and properties

### Chemical Reactions

- that when chemical reactions take place, mass is conserved;
- that virtually all materials, including those in living systems, are made through chemical reactions;
- to represent chemical reactions by word equations;
- that there are different types of reaction, including oxidation and thermal decomposition;
- that useful products can be made from chemical reactions, including the production of metals from metal oxides;
- about chemical reactions, e.g. corrosion of iron, spoiling of food, that are generally not useful;
- that energy transfers that accompany chemical reactions, including the burning of fuels, can be controlled and used;
- about possible effects of burning fossil fuels on the environment.

This conceptual richness was retained, and indeed elaborated in the 1999 specification:

- to represent compounds by formulae and to summarise reactions by word equations;
- how mass is conserved when chemical reactions take place because the same atoms are present, although combined in different ways.

The 1995 and 1999 specifications were conceptually rich, in a manner which is consistent with the notion of ‘entitlement’. The bulk of conceptual content was evidence-based (Oates 2014a). But in the 2007 specifications, explicit reference to conservation of mass, oxidation etc. was no longer present. The legal requirement to ensure that children understood these essential elements was lifted from the system. The specification became:

2005-07

### Chemical and Material Behaviour

In their study of science, the following should be covered:

- Chemical change takes place by the rearrangement of atoms in substances;
- There are patterns in the chemical reactions between substances;
- New materials are made from natural resources by chemical reactions;
- The properties of a material determine its uses.

A statement such as: ‘...there are patterns in the chemical reactions between substances...’ is highly generic, and does not ensure that key concepts such as conservation of mass are acquired at the right time in education, or by all pupils. This subverts the original purposes of the National Curriculum for England.

I have stated elsewhere that: ‘...On the release of the revised specifications I sought from QCA subject officers clarification on the intended impact of these generic specifications. The response was interesting in terms of use of the different instruments which had been developed by QCA. The officers stated that ‘...although the programmes of study have changed, the (far more detailed) schemes of work will remain the same...’. This is problematic on two important counts. Firstly, the key claim that the National Curriculum had

been slimmed and school autonomy opened up thus was open to question. Secondly, the Schemes of Work were not a statutory requirement, and therefore not a formal requirement of schools. The QCA's position represented a serious policy confusion regarding instruments and aims. By failing to use the statutory instruments for a principled statement of key conceptual content, the 2007 specifications represented a serious threat to science education at KS3...' (Oates 2014a).

Over the period 1997 to the present, as a result of the focus on assessed outcomes in national accountability measures, assessment has increasingly dominated curriculum thinking in schools (Mansell 2008) with key 'mediating instruments' being 'spent' national assessment papers (used in the last segment of Primary education (Oates 2010) and public examination specifications (used in the second segment of 11-16 education) (House of Commons 2012). The necessary narrowness of such mediating instruments appears to be a principal driver for undesirable narrowing in the school curriculum (Boyle & Bragg 2005; Mansell 2008; House of Commons 2012). Ironically, expansive approved textbooks – possessing high quality and exhibiting Schmidt's 'curriculum coherence' (Schmidt & Prawat 2006) could be an antidote to such narrowing. Indeed, policy makers in England should attend to Reynolds' and Farrell's interesting finding (Reynolds & Farrell 1996) that, in key jurisdictions, high performing teachers are well-disposed and enthusiastic about textbooks. However, current sentiment in England amongst many educationalists is strongly opposed to approved textbooks; a sentiment which has arisen repeatedly whilst I have been researching the role of textbooks in system improvement strategy.

The 2011 TIMSS survey included collection of data on countries' use of textbooks and worksheets either as 'a basis of instruction' or to 'supplement' instruction:

### **Maths**

England: as a basis of instruction 11%; supplementing 78%. Total 89%

Sweden: total 95%

Germany: 99%

South Korea: 99%

Poland: 100%

(Mullis et al 2012)

With levels of use lower than other jurisdictions, what is interesting in England is the existence of an underlying 'anti-textbook ethos', and its location in teacher training and educational research communities. Marsden's comprehensive and penetrating 2001 analysis of textbook use in geography, history and social studies emphasised the pervasiveness of this ethos in teaching training. Marsden identifies an influence of post-modernist doctrine in the development of an 'anti-textbook' and 'anti-subject' ethos:

'...textbook research has been given significantly lower priority in Britain than in mainland Europe and in North America. Attitudes in educational circles in this country towards textbooks have been more negative than in many other nations, to the extent that an anti-textbook ethos can fairly be postulated. It is important, however, not to take this generalisation too far, and to suggest that the ethos is everywhere present and that those who hold it do so equally strongly. It is probably just to surmise that it is more evident among education tutors and advisers than teachers; among primary teachers than secondary teachers; and, in the secondary sphere, among teachers in the humanities than in

mathematics and the sciences. Supporting evidence is, however, more easily acquired informally, and often at an anecdotal level, than from the formal literature. Lidstone, for example, recalls that orally he was actively discouraged by university education department tutors from using textbooks during periods of teaching practice, even though experienced teachers in the schools regularly did so...’ (Marsden 2001, p55)...’

‘...Post-modernism has inexorably infiltrated the thinking of educationists. Some post-modernists educational writers have recycled the long criticised linkage of subject-centred approaches with traditional textbooks, and this in turn with an outmoded ‘modernist’ agenda of ‘subject aggrandisement’ (Edwards, 1996, p.222). In Britain and the United States therefore, a simplistically polarised coupling of ‘modernism’ with anachronism, and of ‘post-modernism’ with progressivism, has emerged, even though child-centred approaches, as noted above, can be traced back at least to the late eighteenth century...’ (Marsden 2001, p65).

In line with this, the work of the 2010 Curriculum Review, in identifying the role of approved textbooks in a range of high-performing systems, attracted considerable criticism from members of the research community in England.

However, underpinned by the concept of ‘curriculum coherence’, recognition of the importance of not merely comparing top level curriculum specifications but also the detail contained in other instruments, was a key element of the comparative method deployed in the 2010 Review. Schmidt’s concept of ‘curriculum coherence’ relates to (i) material in curriculum frameworks, textbooks etc being in an appropriate age-related sequence; and (ii) that all elements in a system should ‘line up’, so that contradictions are not set up in the different elements, and professionals are not subject to contradictory incentives and targets (Schmidt & Prawat 2006). A framework was developed in Cambridge (Oates 2010) to further elaborate Schmidt’s concept of ‘curriculum coherence’, consisting of a listing of system elements which should sit in coherent relation:

- 1 curriculum content (nc specifications, support materials, etc)
- 2 assessment and qualifications
- 3 national framework for qualifications
- 4 inspection
- 5 pedagogy
- 6 professional development
- 7 institutional development
- 8 institutional forms and structures (eg size of schools, education phases)
- 9 allied social measures (linking social care, health care and education)
- 10 funding
- 11 governance (autonomy versus direct control)
- 12 accountability arrangements
- 13 labour market/professional licensing
- 14 allied labour market regulation (eg health and safety legislation; insurance regulation)

(Oates 2010)

This framework is predicated on the notion that these elements interact in complex patterns of dependency and cause (Morris P & Auld E 2013). This is turn suggested that national

curriculum framework cannot be considered in isolation from other elements of the system – such as learning resources, inspection, etc.

The Review explicitly addressed the question: if a National Curriculum can be considered as statement of intended outcomes in the enacted curriculum, what instruments transmit and mediate that intention – and what is their status and form?

The ‘form’ issue relates particularly to granularity and detail – and affects decisions regarding the necessary form of the National Curriculum in a specific national setting. Because of the importance of mediating instruments (guidance, training support, textbooks, etc), more detailed instruments lower in the system can allow more generic statements in a jurisdiction’s topline National Curriculum specification. Conversely, in the absence of more detailed mediating instruments, a National Curriculum may need to contain more granular, detailed statements.

The ‘status’ issue also affects granularity and detail in the topline National Curriculum statements. If mediating instruments are not statutory or use is not universal, then the intentions embodied in a highly-generic set of National Curriculum statements may not be realised in the enacted curriculum.

Note that this is NOT arguing that a National Curriculum should, or can, determine every aspect and element of the enacted curriculum. What I AM saying is that if a National Curriculum has a set of aims and intentions associated with it, the form of the National Curriculum is partly determined by form of mediating instruments and their status. Additionally, in line with Schmidt’s concept of ‘curriculum coherence’ the mere existence of mediating instruments is not enough: they must ‘cohere’ – they must ‘line up’ with the aims and intentions of the overall curricular and strategic aims. For example, the topline curriculum statements in Singapore are relatively parsimonious. However, the existence of state-approved textbooks which schools are required to use if they choose to use textbooks means that systematic detailed interpretation of the topline statements is provided to teachers (and to pupils and parents).

Key jurisdictions in the 2010 review have the following textbook/resource approval policies in place:

#### Alberta

‘Authorised’ texts in core subjects (eg maths, English), approved by Alberta Learning (province administration) under the authority of the Minister of Learning. A range of alternative texts and resources are available in the approved lists, enabling a degree of school/teacher choice.

#### Massachusetts

Massachusetts is an open territory state with no centralized textbook acquisition. The selection and purchase of textbooks and instructional materials is a local district activity. However, there exist centres such as AIM whose objectives are to identify and make accessible materials which meet certain criteria. (National Center on accessible instructional materials 2014)

## Hong Kong

Textbooks are approved, by the Hong Kong Education Bureau, on the basis of alignment with the Hong Kong curriculum and formal quality criteria: ‘The major role of the Government in textbook supply is to review the textbooks submitted by publishers and include those textbooks which meet the requirements of the relevant curriculum guides and the required standard in the “Recommended Textbook List” (RTL) for schools’ selection’ (ref Education Bureau circular memorandum 42/2013). Schools are able to choose from a range of approved resources, developed by private providers. Specific, carefully-limited developments in electronic resources as analogues and developments of existing textbooks have been put in place within the approved system (the Education Bureau of Hong Kong E-Textbook Market Development Scheme 2012).

## Singapore

The Ministry of Education is vested with the power of approval: ‘...MOE engages publishers to develop instructional materials based on the syllabuses. The quality of the instructional materials is maintained through a textbook review process whereby the materials are reviewed by a panel of professionals, including curriculum specialists, teachers and academics from the universities. There are several iterations to the process before the materials are approved and listed on MOE’s Approved Textbook List for selection by the schools...’ (MOE 2012). Schools are not legally obliged to use textbooks, but if they do, they must use an approved textbook. As in Hong Kong, specific, carefully-limited developments in electronic resources as analogues and developments of existing textbooks have been put in place within the approved system.

## Finland

Currently, there are no explicit processes of State approval, but this follows a period of tight regulation of textbook form and content. Textbooks were approved by the Examining Office of the National Board of Education, throughout the period of implementation of 1968 education reform act, until the mid 1990’s. This was a significant part of educational reform. The important legacy effect of this raises a question mark over the conclusions of Wilkens (Wilkens 2011) who places Finland in the ‘no State influence on textbooks’ category – which ignores the powerful influence of prior history of State approval processes in Finland.

## England

There has been no tradition of direct State approval of textbooks in England, and currently there are no processes in place. However, two instances of central control are worthy of note. The first is the implementation of the Literacy and Numeracy Strategies (1998-2011) in primary education (DfE 2012). These were non-statutory but assumed a quasi-statutory place, adopted in the majority of schools; with rafts of centrally-produced materials. The second is the existence of ‘endorsed textbooks’ which are endorsed by organisations offering State-approved examinations (at age 16 and 18). Again, the textbooks are not statutory, but the link to high-stakes assessment (critical in national accountability measures) makes their use compelling amongst some schools, and choice of textbook strongly linked to choice of specific examination .

Again, note that I am NOT arguing that central/State approval of textbooks is uniquely associated with high performing jurisdictions. There are high performing jurisdictions which do not use central approval processes (eg Massachusetts) and low ranked jurisdictions that do. However, close scrutiny shows that approved resources carry specific and important

functions in a range of high-performing jurisdictions, with the processes for approval meeting Schmidt's criterion of 'curriculum coherence' (Schmidt & Prawat 2006). The quality and characteristics of resources in selected high performing jurisdictions are analysed in further detail in the final section of this paper.

In using the terms 'transmission of curriculum intent' and 'instruments of enactment' in this paper, I do not naively assume that 'perfect transmission' is either possible or desirable. Paul Norris' analysis of the context in Hong Kong provides a clear outline of the process of mediation and adjustment that can occur in real arrangements:

'...Educational Publishers: This group has an influence on the curriculum which is very variable. After a syllabus or curriculum guide has been produced, the textbooks and related resources will determine how the topics are explained and the depth of coverage. This can be a very strong influence as teachers and pupils rely heavily on these resources in most classrooms. For subjects studied by a large number of pupils, many resources will be available and these might have slightly different emphases and approaches which teachers can choose from. However, in the long run, because published resources are economic commodities, the important influences on contents are teachers and schools, because they decide which resources will be adopted, and publishers are very cautious of producing resources which are very different from those with which teachers are familiar. One consequence of this is a tendency over time for resources from different publishers to become similar, as they follow the market leader. There is also the possibility that publishers will engage in self-censorship as they anticipate what they think the government wants.

Schools and Teachers: Schools and teachers have a strong influence on the implemented curriculum because they decide what methods of teaching are used, the styles of learning that are encouraged, and the textbooks which the pupils will use. Consequently, many innovations designed to reduce the strong influence of academic rationalism (see p.48) on the curriculum have failed simply because they were not adopted in schools.

(Morris & Adamson 2010 p38)

Although very valuable in reflecting on processes of mediation, this in some ways underrepresents the quality of the textbooks in Hong Kong – as the empirical analysis of content later in this paper suggests.

### **The errors of ahistorical analysis – the issue of state-approved textbooks in Finland during its period of fundamental transformation**

Finland leapt to international attention following its performance in PISA 2000. The result led to high levels of 'educational tourism', with extraordinary scrutiny of the nature of the Finnish system. Prominent commentary (Hancock 2011; Partanen A 2011; Guardian 2014) has focused on the current form of the Finnish system, associating elements of its current form with its success. But many analyses have not followed the methodological tenets adopted at the outset of the 2010 curriculum review in England (Oates 2010) – particularly, for any given system which has enjoyed a period of improvement, what form did arrangements take prior to and during its period of improvement? This is a different question (and analytic stance) to inferring cause and explanatory power from '...what does the system look like now, now that it has achieved high performance?'. To adopt this second stance is to commit an error of chronology and thus an error of causation (Oates 2010). Finland's system,

from the very late 90's to the present day, has been characterized by relatively high school autonomy (by OECDs international measures, low levels of central inspection and low levels of external testing (Sahlberg 2011). The system is characterized by 'front end restriction' associated with highly selective, long duration initial teaching training. This contrasts with systems focusing on 'back end restriction' – ie a strong emphasis on inspection and target-based accountability arrangements. Many accounts of Finland also fail to engage with problems currently manifest in the system – continued disparity of performance between boys and girls; rising tensions in urban areas regarding social mix in schools; issues of choice and quality following large scale closures of small schools; continued complaints of poor maths attainment in first year undergraduates; and declining performance at fifteen in some localities (Rinne & Tikkanen 2011; Goldstein D 2008; Autti O & Hyry-Beihammer 2014; Askew et al 2010). None of these problems are a denigration of Finland's outstanding achievement in so substantially raising its performance in the period 1970-1999. But a key question is whether the current form of the system was also the case during the time of Finland's transformation from a relatively moribund system to a fast-improving system. The historical record suggests that the answer to this is a resounding 'no'. More thorough historical analysis of the form of the system, the nature of policy, and the conditions in the system preceding, and at the time of, rapid improvement suggests that state-approved textbooks were an important part of the mix at that time. Finnish teachers' own testimony helps to understand the role which they assumed during the move to fully-comprehensive education – namely as 'part of the steering mechanisms of the system' (ref). Key Finnish educational analysts concur:

'...The Basic Education (9 grades, 7-16 yrs) Act in Finland was accepted 1968, implemented starting 1972 and covering all Finland by 1976. From 1972 to 1985, the system was strongly state controlled, all teachers were requested to participate extensive in-service training, where the obligatory contents were delivered. The school inspection was active, nationally through National Board of Education (NBE) and locally through provincial school inspections. All textbooks were pre-examined and approved by NBE: all the teaching materials were to be aligned to the 1970 Framework Curriculum for the Comprehensive School. The curriculum was very detailed (2 large volumes, pages over 600) and the same for all municipalities. There were no state-level assessments in any school subjects, not even at the end of basic education (9th grade, 15-16 year-old students). However, the national comparability of school marks, given by teachers, was ensured by the detailed curriculum, intensive in-service training, but also by developing standardized tests in major school subjects, for public, non-profit use, by educational researchers under the order of NBE...'

Hautamäki 2014

As outlined above, the precise sequence of development in Finland is important. Consideration of the necessary time-lags and genuine phasing of transformation of the system leads to a conclusion that textbook quality has been used as a policy instrument and has been an important factor (naturally, one amongst many of the 'control factors' presented above) in system change in Finland.

Following Sahlberg and others, I see the following major phases in the development of modern Finnish arrangements:

#### Phase 1 - foundations

Following Cygneus' transnational comparative work, development (in 1861) of a distinctive model of general education, following centuries of commitment to personal learning, particularly in respect of literacy. A distinctive emphasis in general education of education of women, civic participation and vocational education was accompanied by development of high quality teacher preparation. Concern, from Finnish independence (1917) onwards, to establish the foundations of universal education was followed by concerns (late 1950s onwards) regarding high spread of attainment.

#### Phase 2 - enactment

Systemwide reform policy established in the reform act of 1968 - movement to a fully comprehensive system effected during the 1970s. Foundations established, of the system which gave rise to high performance in late. Values, aims and practices laid down through widespread social and political discussion, streaming discontinued in 1985. High levels of legal prescription to implement change, accompanied by highly active, centralised inspection of classroom teaching and learning. Textbooks centrally approved by National Board of Education; in 1975 this Board ordered all teaching materials books maps and tapes to be checked by the official examiners' office in order to ensure that they were consistent with full comprehensivisation of the system. Inspection heavily deployed in order to ensure that classroom practice corresponded with the aims of reformed, comprehensive education and were not subverting it.

#### Phase 3 - consolidation

Strategic move to higher levels of school autonomy. Low levels of central inspection. Focus on teacher quality through long duration, high level, 'twin track' (pedagogy and specialism) ITT. Deregulation and decentralization in the 1980s, the examining office of the National Board of Education (responsible for central approval of textbooks) was closed in 1990. There is some disagreement about exactly when approval of textbooks ended – Krokfors & Hurmerinta (Krokfors & Hurmerinta 2012) give the date as 1994 ('...abandonment of centralized control of textbooks and school inspection...'). In my interviews with current Finnish teachers and educationalists, the most common response to the question '...what is essential to quality in the Finnish system...?' is '...high quality teachers and high quality materials...' (Oates 2013). No longer State-approved, but still considered as a very important factor in system quality.

It on phase 3 that most international interest has focused, frequently committing the 'error of ahistorical analysis' which either explicitly or implicitly associates the current form of the system with the period of its transformation and substantial improvement – a period (phase 2) in which arrangements were very different. Phase 2 was characterized by very high levels of centralized prescription and control, and was designed to ensure thorough 're-conditioning' of the system around the principles of fully comprehensive education. This phase is not well-recognised outside of Finland; it jars with many contemporary non-Finnish accounts of the system– it may indeed be an 'inconvenient truth' at odds with the 'desired' wider narrative regarding autonomy (Alexander 2012; Benton 2014).

An important note: it is vital to recognize that I am NOT advocating the Phase 2 approach in Finland as a general system improvement strategy, to be unreflectively applied to any other

system in other circumstances and at another time. Rather, I am trying to correct the misrepresentation of the character of the initial modern improvement phase in Finland. Using the ‘control factors’ analysis, we can see that specific factors assumed an interesting form during this phase, with some factors playing a greater role than they play in phase 3. A more accurate reading of the initial modern improvement phase highlights textbooks as an important factor, another ‘inconvenient truth’ for some analysts. I am not advocating that all systems need state-approved textbooks, but I AM highlighting their importance in the transformation effected in Phase 2 in Finland.

In phase 2, many factors – widespread social discussion of the purpose and form of education, further development of teacher training, etc interacted to create improvement and effective implementation of the Finnish model of comprehensive education. But within this, textbook control appears to be an important element of the switch to the fully comprehensive system. They were a vehicle of transmission, and of consolidation of the new values and practices of the reformed system.

Textbook research in Finland has been analysed (Ahonen undated) and this notes the way in which textbooks have been viewed as instruments of control and social reproduction – and, indeed, subject to important critique by student organisations, an interesting element of Finnish history highlighting both the importance of textbooks and the negotiated or allowed influence of learners within the system (Ahonen op cit). The history of Finnish research on textbooks includes 1970s work using Wiio’s instrument to measure the legibility of texts – authors were then ‘asked to comply with the indicators’. Interestingly, the appropriate weight of schoolbags was introduced as a constraint in textbook writing. ‘...Textbooks became light, richly illustrated and simple to read. Appearance and motivational power of books (was) surveyed...’ (Ahonen op cit p3).

Overall, the system reforms moved the system from moribund performance in the late 1960’s to high performance, as measured in PISA 2000. These dates are important in respect of the key dates regarding patterns of control in textbooks in Finland. The high levels of control – including control of textbooks - played a part in the initial, coherent transformation of the system to being a comprehensive one, and ensured alignment in the new system arrangements. The subsequent interventions on textbooks enhanced quality. Looking at timelags in the system, the impact of approved books (and more importantly the common criteria around them) are unlikely suddenly to cease in the early 1990s. Approval may have ceased but use of the approved books (and the impact on the shape and content of the school curriculum) did not cease overnight, on the date that textbook approval ended. The children who did so well in the first PISA survey were 15 years of age. They progressed through a system which was continuing to be conditioned by the textbook forms which had been established during the period of approval and intensive research – ie these children may have been measured in 2000 but they were educated in the mid-90s, and in a system with many quality features established during the late 1980s. As stated above, Finnish teachers continue to highlight ‘high quality materials’ as a key feature of the system – even if the mode of production and application of quality criteria has evolved (Tero 2010; Kuismanen & Holopainen 2014).

The Finnish system now has many feature associated with relatively high autonomy. But this is the system now. And the route to high levels of autonomy is paved with interesting movement from central control and regulation to devolved arrangements.

It is clear from the literature and from discussions with Finnish educationalists that approval of textbooks was a control element in the transformation of the system to a comprehensive system. Once the system values and ‘acceptable’ practices were established, relaxation of high levels of wide-ranging central control began (ie movement towards the current pattern of autonomy) but it is vital to recognize the quality criteria already established and communicated during the control phase was a vital element of system transformation, and contemporary system performance.

As an addendum, it is important to note that Vitikka Krokfors and Hurmerinta 2012 theorise educational resources as part of the ‘steering system’ of basic education. In the current system in Finland they see the function of these resources as ‘independently interpret curricula’ and thus have a significant role in the enacted curriculum. They note that, now, ‘...this is the only aspect of the educational steering system which is not governed or financed by a public organization...’ (Vitikka Krokfors & Hurmerinta 2012 p87).

For this paper, this section will conclude on two key points:

- 1  
the drive to a specific form of comprehensive education was a key part of the enhancement of the Finnish education system – and textbook approval played a strategic rather than contingent role in that change. They were aligned with and communicated the values and practices associated with comprehensive education.
- 2  
using the ‘control factors’ perspective, recognizing that textbooks assumed an important role in system transformation suggests that if they are NOT being used by a jurisdiction in supporting that jurisdiction’s specific system improvement strategy, then the function that they carry must be discharged through other factors or means

### **Textbook qualities – case studies**

The theoretical framework for the 2010 review of the National Curriculum (Oates T 2010) saw approved textbooks as part of the instruments for explicating the content of a National Curriculum and essential for international comparative work on the form and content of national curricula in other jurisdictions. As a result, over 200 textbooks were collected from target jurisdictions and used as part of the transnational curriculum content mappings. This curation of textbooks allowed further analysis of the qualities of the textbooks themselves. The case studies below were the result of ‘elements’ and ‘model’ analysis. Each textbook was documented for the different kinds of information elements which it contained and the manner in which it presented these elements. An overall assessment was made of the coherence of the text, based on either correspondence to a stated model (eg spiral curriculum) or to an obvious form adopted in the text.

What emerged was a fascinating set of contrasts. A class of textbooks can be summarized as ‘traditional’ – often excellent and simple, laying out specific concepts and content in a discipline but not using a specific model of learning to present or structure the material. A second class explicitly embodied specific models of learning – for example, a review activity to establish whether pupils are ready for a new activity, blocks of learning content focused tightly on a concept, assessment and rehearsal activities, extension activities. A third class was also evident – highly instrumental texts linked to examinations, heavily lead by the structure of the examination and loaded with assessment identical to the examination.

This has led to a difficult policy context in England. In 2012 the Education and Skills Select Committee considered evidence on textbooks and considered the apparent emergence of an inappropriately close and constrained relationship between specific examinations and ‘awarding body endorsed’ textbooks. It was suggested that these too-explicitly flagged elements relating to specific grades in examinations, as well as restricted school choice of material. Initial discussion in the Select Committee suggested that there should be dislocation and gross separation of exams and textbooks, a sentiment which currently has been adopted in the policy of the national regulator, Ofqual. However, evidence submitted to the Select Committee by Cambridge Assessment, using Schmidt’s concept of ‘curriculum coherence’, suggested that it may well be the case that the current relationship between textbooks and examinations is wrong (and the quality of textbooks too low) but this fact does not legitimate the proposition that there should be a very weak relation or no relation at all between textbooks and examinations (Cambridge Assessment).

This instrumental character of textbooks in England was highlighted in transnational comparison of textbook form and content, with contrasts highlighted in the sample case studies which now follow.

### **Case study texts extracted from the textbook analysis**

#### **Hong Kong – secondary maths textbook**

##### **Elements**

Statement of Pre-requisites

Review activity to determine whether pupil is ready for the chapter

Different forms of the equations of circles

Features of circles from the equations

Equations of circles from the different given conditions

Intersection of a straight line and a circle

Inclusion of a series of problems

Check through assessment: 6 problems, 1 practice exam Q, 1 lively maths problem

##### **Key features**

Important evaluation of student readiness at the outset of each section

Extremely clear statement of concepts/constructs

Good elaboration through application

Checking of understanding at key points

Spiral curriculum model

#### **Singapore – secondary maths textbook**

##### **Elements**

Chapter overview – narrative regarding concepts and ideas – engagement

Discover – learning outcomes

Use of diagrams explained

Key ideas – concepts/constructs – margin notes – focus on concepts

Worked examples

Did you know – interesting facts

Guidance on the use of a calculator

Exercises  
'Time out activity'  
Journal writing task  
Summary – recap and revision – checking main concepts  
Revision paper  
Ten-minute concept check  
Review paper  
Enrichment maths

### **Key features**

Extremely clear statement of concepts/constructs  
Constant re-inforcement of concepts/constructs  
Good elaboration through extended application  
Requirement for self-reflection through use of journal task  
Checking of understanding at key points  
Extension of application and understanding through enrichment element  
Structured use of calculator accords with King's College research  
Worked examples to clearly show concept and operations

### **England - International General Certificate of Education (IGCSE) textbook**

#### **Elements**

Clear statements of mathematical ideas  
Clear statements of operations  
Some sample activities

#### **Key features**

Highly traditional form  
High expectations  
Very flexible resource  
Succinct and clear on both concepts and operations  
Does not prescribe pedagogy to any significant extent  
Presupposes high quality teaching unlike Hong Kong and Singapore texts which include a clear learning model

### **England - General Certificate of Secondary Education (GCSE) textbook KS4**

#### **Elements**

Extremely diverse content within diverse structure – complex  
Divided into Higher Tier and Lower Tier elements to match examination  
299 pages long  
Sample full GCSE exam paper very early in the text: p11

#### **Key features**

Rather incoherent presentation with little signposting of key concepts  
Highly instrumental text  
No extension activities  
Formative assessment defined entirely by the form of end-assessment  
Presupposes high quality teaching unlike Hong Kong and Singapore texts which include a clear learning model

These case studies demonstrate some clear features of high quality in the Singapore and Hong Kong texts, such as the extended application of maths and reflective activities in the Singapore texts, the ‘readiness’ assessment in the Hong Kong texts, and the extremely clear presentation, explanation and reinforcement of key concepts and ideas in both. The coherence with the national curricula in each setting, and the strength of the pedagogic model promoted by the text, is impressive.

### **Conclusion**

Textbooks and resources should be considered as an integral part of establishing, within education arrangements, the policy intentions of a national curriculum. While precise approval mechanisms differ around the world, the majority of high-performing jurisdictions – with some notable exceptions such as Massachusetts – locate textbooks as part of the set of ‘control factors’ determining the form and quality of arrangements.

The analysis of Finland shows that the historical role of textbooks in system improvement has been misrepresented in some of the important contemporary analysis of that country.

The technical comparison of textbooks indicates the emergence of innovative and well-theorised textbook forms, meeting Schmidt’s criterion regarding ‘curriculum coherence’, and assuming an important role in improvement strategies.

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