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The Place of Knowledge in Curricula: A Research-informed Analysis

Professor Dominic Wyse and Dr Yana Manyukhina
UCL Institute of Education

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This paper reports the outcome of an analysis of the nature of knowledge and its place in curricula. The work was commissioned in early 2018 as part of the proposed redevelopment of the Primary School Curriculum in Ireland by the National Council for Curriculum and Assessment (NCCA). In line with the research questions established by the NCCA the opening section of the paper briefly addresses how the concept of knowledge can be defined. The main part of the paper reports the findings from a discourse analysis of curriculum texts from Australia, Canada, Hong Kong and England. The final section of the paper puts forward some provisional recommendations for consideration by stakeholders.

1. Definition of the concept 'knowledge' in the context of a primary school curriculum

One of the reasons that defining the concept of knowledge is such a difficult task is reflected, for example, in the multiple definitions offered by the Oxford English Dictionary (OED). The OED lists three categories of definitions, each with multiple entries, as follows:

> I. Acknowledgement or recognition (3 entries - obsolete and historical).
> II. The fact or condition of knowing something (13 entries).
> III. The object of knowing; something known or made known (6 entries).

Within the second category the narrowest definition is the 4th entry which emphasises factual knowledge or information, linked with 'correctness':

> 4. c**.** … The fact or state of having a correct idea or understanding of something; the possession of information about something. (OED, online)

The 6th entry is notable for its emphasis on "understanding", and its inclusion of "skill" as something that one can be said to have knowledge of:

> 6. a. … The fact or condition of having acquired a practical understanding or command of, or competence or skill in, a particular subject, language, etc., esp. through instruction, study, or practice; skill or expertise acquired in a particular subject, etc., through learning. (*Op. cit*.)

There is a need to establish a working definition of 'knowledge' suitable to inform further consideration of the complexities of knowledge in national curricula. The succinct working definition of knowledge that we have adopted for this paper is as follows:

> **Knowledge: Understanding of something acquired through learning, guidance, and practice.**

On its own this definition is neutral in relation to the kind of knowledge that is most appropriate or beneficial. Neutrality in the definition is logically necessary because the value of knowledge, for example 'powerful knowledge' (Young, 2013), is attributed through the processes by which curricula are developed, written and established. Hence, the attribution of value or status to areas of knowledge, an equally important consideration when developing curricula, needs to be kept conceptually distinct from the definition of knowledge.

The sociologist of education Basil Bernstein defined curriculum as 'the principle by which units of time and their contents are brought into special relationship with each other' (Bernstein, 1971: 48). It is within the 'contents' that fill the 'units of time' where knowledge, and its exchange by teachers and pupils, is specified. For Bernstein, curriculum represents

valid knowledge; pedagogy is the valid transmission of knowledge; and evaluation is the valid realization of knowledge (see Wyse, Hayward and Pandya, 2015). In later work in the sociology of education Young has emphasised that some knowledge is "better" than other knowledge, something that Young described as 'powerful knowledge'.

> In all fields of enquiry, there is better knowledge, more reliable knowledge, knowledge nearer to truth about the world we live in and to what it is to be human. At the same time, this knowledge is not fixed or given; it is always fallible and open to challenge. (Young, 2013, p. 107)

It is important to recognise that Young's contribution is theoretical rather than empirical, and mainly draws on examples from secondary, further and higher education, so does not attend specifically to primary and early years education. A noteworthy empirical study carried out at secondary level addressing some of Young's theory of knowledge found that the links between university disciplinary knowledge and secondary school subject knowledge were far from straightforward (Yates, 2016).

Johan Muller, an eminent scholar who has collaborated with Michael Young noted,

> It seems that Wyse et al.'s view that knowledge is "both constructed and real" (2014: 5) was right after all. Quite how to establish the reality of "powerful knowledge" while acknowledging its social roots remains a challenge in 2014 as it was in Mannheim's day. What is undeniably underway is a sort of rapprochement, but it remains a work in progress. (Muller, 2016, p. 103)

In Muller's chapter where this quote came from, the idea of knowledge being both constructed and real was a reference to the editorial of the special issue of the BERA *Curriculum Journal* (Wyse et al., 2014) that focused on aims, knowledge and control in curriculum. The editorial built on Biesta's (2014) idea of *transactions* and on Dewian pragmatism, for example Dewey's argument that "good teaching is built on the educator's understanding that there should be an *interaction* between the child's experiences and ideas, and the school's aim to inculcate learning. Less effective learning would take place if, instead of interaction, opposition is built between experience and learning." (Wyse et al., 2014)

Our approach to the analysis of four significant national curricula, that we address next in this paper, is informed by our working definition of knowledge but also in the philosophical and sociological theories of knowledge that have been briefly outlined in this introduction.

Methodology of the Curriculum Analysis

An analysis of curriculum texts was undertaken to examine the ways in which knowledge was represented in curriculum policy documentation from four jurisdictions: Australia, Canada (Ontario), Hong Kong, and England. We undertook a content analysis, and elements of discourse analysis (Hafner, 2017; Gosen and Koole, 2017), to analyse the curriculum texts, focussing on the nature, type, and positioning of knowledge in the national curriculum documents.

The criteria used to make a selection of countries for comparison included the following:

- English language dominant, including national curriculum texts available digitally in English;
- Jurisdictions that include significant numbers of pupils using languages other than English, and significant levels of ethnic diversity
- Population neither significantly greater or less than Ireland
- High scoring in PISA outcomes, both in terms of academic performance and equity issues (OECD, 2018)

As a result, Australia, Canada, Hong Kong and England were selected for comparison.

There are significant differences between the key texts of the four countries' national curricula in terms of appearance, structure, and length. For example, there are multiple documents outlining the primary curriculum in Hong Kong, Canada and Australia in contrast with just one document in England (for a brief overview of the background and key features of the curricula see Appendices 1, 2, 3, 4). To ensure that our analysis was both rigorous and manageable, in each of the four cases we focussed on those curriculum documents and sections of them that had the most significant representations of the role and status of knowledge in the curriculum. These documents and sections focused on learning aims and objectives; recommendations and guidance for practitioners; and the essential content that should be learned by students. In the case of Australia and Canada, sections of the Learning Area/subject guides outlining the content to be taught to students in each year level or grade were not included in the content analysis because the number of documents to review was too many within the confines of the project. However, these documents were carefully reviewed holistically with a view to check the nature and extent of specification of the curriculum content. The following documents were used as the data for the content analysis and discourse analysis:

Australia (AC): The Australian Curriculum: Learning Areas; The Australian Curriculum: General Capabilities; The Australian Curriculum: Cross-Curriculum Priorities.
Canada (Ontario) (OC): The Ontario curriculum subject guides.
Hong-Kong (BECG): The Basic Education Curriculum Guide.
England (NCE): The National Curriculum in England: Framework Document.

The documents above were subjected to a keyword search for mentions of the terms "knowledge" and "know". Entire sentences in which these terms appeared were extracted and added to an Excel database for analysis. Sentences containing 'knowledge' where the meaning related to teacher knowledge were excluded as these were deemed not sufficiently relevant to the aims of the study which focusses on the nature of knowledge in relation to pupils. The analyses had four main foci:

1. The types of statements identified as prevalent across the four national curricula were categorised as follows (see Appendix 1 for more detail and examples):

- statement of intent: statements outlining learning aims and objectives, both overall and for particular learning areas
- statement of guidance: statements outlining recommendations and guidance for practitioners
- statement of context: statements describing actual and desirable learning contexts
- statement of learning process: statements describing different aspects of the learning process
- statement of outcome: statements outlining overall and specific learning outcomes

- statement of experience and outcome: statements integrating specification of learning outcomes with identification of learning experiences through which these outcomes can be achieved.

2. The analyses also addressed the type of knowledge referred to. A key distinction was made between *disciplinary knowledge*, i.e. knowledge that is strongly associated with academic and or traditional school/subjects or areas of study, and *non-disciplinary knowledge*, i.e. that which is largely independent of academic disciplines and can be gained through day-to-day experiences (commonly referred to as "common", "life", or "everyday" knowledge).

3. The implied value of knowledge. This category is concerned with the curricula's perspectives on the value of knowledge and the purpose of knowledge acquisition. It is meant to provide insight into the kinds of justifications invoked in the national curricula for making knowledge an important constituting element of the school curriculum. Where relevant, knowledge mentions were categorised according to whether they framed knowledge as having intrinsic value (knowledge as an end in itself) or instrumental value (knowledge as a means to some further ends).

4. The positioning of mentions of knowledge in relation to other curriculum elements. We yield insight into this question by considering the relative numbers and proportions of statements focussing entirely on knowledge versus those in which knowledge was placed among other curriculum elements such as understanding, skills, competencies, capabilities, dispositions, values, and attitudes.

To assess the reliability of the coding a random sample of the coded sentences including the key words was reviewed by a second coder. The assessment showed high agreement on all individual codes that were reviewed. In addition, the ongoing discussions about the nature of the discourse categories and the analyses added to the reliability of the coding.

Findings

2. Rationale for designating or not designating knowledge as a central dimension of a primary curriculum in a changing society and global context

2. a. Ways knowledge is represented in the selected curricula

In considering the types of knowledge represented in the curricula, the extent to which knowledge is fore-fronted, and what justifications are provided, we examined the context for the mentions of knowledge. While the frequencies of knowledge mentions are not directly comparable among the four curricula due to significant differences in the length of the documents, consideration of the relative numbers and proportions of different types of statements in which knowledge appears in each curriculum yields valuable insights. As Table 1 shows, in all four curricula there is a clear tendency for knowledge to be prevalent in statements providing guidance and recommendations for practitioners.

Table 1. Types of statements referring to knowledge				
	NCE	OC	AC	BECG
Curriculum intent	14 (9.6%)	28 (5.8%)	46 (19.2%)	27 (18.4%)
Practitioner guidance	100 (68.5%)	382 (78.6%)	101 (42.1%)	84 (59.6%)
Learning context	0	6 (1.2%)	0	7 (5.0%)
Learning process	0	16 (3.3%)	11 (4.6%)	6 (4.3%)
Learning outcome	32 (21.9%)	29 (6.0%)	48 (20.0%)	18 (12.8%)
Learning experience and outcome	0	25 (5.1%)	34 (14.2%)	0
Total	146	486	240	142

Note: Percentages indicate the percentage of within-country totals

In each jurisdiction, this pattern is driven by different educational policy positions, intentions, and aims. In the National Curriculum in England (NCE) and the Australian Curriculum (AC) the frequency with which knowledge appears in statements providing guidance for teachers on instructional and assessment strategies reflects the high importance ascribed to knowledge acquisition. For example, in England the concept of "core knowledge" is emphasised: "The national curriculum provides an outline of core knowledge around which teachers can develop exciting and stimulating lessons to promote the development of pupils' knowledge, understanding and skills as part of the wider school curriculum" (NCE, p.6).

In the Ontario Curriculum (OC) the emphasis on knowledge is consistently present in relation to statements about teaching, learning, and assessment in schools. However, an important distinction is made between "knowledge" and "understanding": "… in the Knowledge and Understanding category, assessment of knowledge has an emphasis on accuracy, and assessment of understanding has an emphasis on the depth of an explanation" (OC: Arts, p.33)

In the case of Hong Kong's Basic Education Curriculum Guide (BECG), knowledge mentioned in statements of guidance is not aimed at assigning knowledge the central role in the curriculum. Instead, it is used to orientate educational practitioners towards a particular approach to knowledge focused on whole-person development and life-long learning through "investigation", as illustrated by the following quote: "Investigation activities not only help students increase their knowledge and enhance their learning capabilities, but also arouse their curiosity, increase their intrinsic motivation for learning, and above all, nurture a positive attitude towards learning" (BECG, Ch.3C, p.1).

The BECG explicitly instructs practitioners to "avoid developing a curriculum that is biased towards knowledge learning" (BECG, Ch.1.5.2, p.8), revealing its strong association with a recent trend in school education around the world to move away from treating knowledge acquisition as the single most important dimension of a curriculum as part of a shift towards broader learning goals (e.g. see the paper by Carol McGuiness written for the NCCA review).

Knowledge and disciplinarity

Disciplinary knowledge receives overwhelming attention in the NCE, the AC, and the OC as can be seen in Table 2.

Table 2. Disciplinary vs non-disciplinary knowledge mentions				
	NCE	OC	AC	BECG
Disciplinary	133 (91.1%)	397 (81.5%)	182 (75.8%)	30 (21.1%)
Non-disciplinary	2 (1.4%)	42 (8.6%)	26 (10.8%)	10 (7.0%)
Unspecified	11 (7.5%)	48 (9.9%)	32 (13.3%)	102 (71.8%)
Total	146	487	240	142

Note: Percentages indicate the percentage of within-country totals

The NCE, the AC, and the OC curricula demonstrate an intention to establish strong connections between disciplinary knowledge and the content of the curriculum, as confirmed by the following quotes:

> Pupils should be taught to: solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes (NCE, p. 129)

> The application of phonemic awareness and phonic knowledge to the development of reading, especially from Foundation to Year 2, is of critical importance (AC: English - How the Subject Works)

> The science and technology curriculum expectations are organized in four strands, which are the major areas of knowledge and skills in the science and technology curriculum (OC: Science and Technology, p.11)

In contrast, the vast majority (~72%) of knowledge mentions appearing in the BECG are unspecified, that is they do not make strong distinctions between disciplinary and non-disciplinary knowledge. For example: "… opportunities and space should be provided for students to explore and co-construct knowledge with peers to encourage them to actively participate in developing independent and self-directed learning skills" (BECG, Ch.1.5.2, p.8) Thus, there appears to be a blurring of boundaries between disciplinary and non-disciplinary knowledge in the BECG. This suggests an intention to elevate the status of non-disciplinary knowledge and promote it at the very least to see it as important as disciplinary subject knowledge.

When considering how the presence and status of knowledge is justified in the four curricula, the NCE and the AC are characterised by an inconsistent stance on the value of knowledge. As Table 3 shows, neither of the two curricula has a clear framing of knowledge as either intrinsically or instrumentally valuable. The NCE's and AC's lack of explicit accounts about the nature of knowledge acquisition leads to questions about why disciplinary knowledge was made an essential component of the curriculum and a key focus of instruction and assessment in schools.

Table 3. Implied value of knowledge				
	NCE	OC	AC	BECG
Intrinsic	60 (41.1.%)	64 (13.2%)	68 (28.3%)	66 (46.5%)
Instrumental	58 (39.7%	254 (52.3%)	94 (39.2%)	32 (22.5%)
Intrinsic and instrumental	12 (8.2%)	21 (4.3%)	12 (5.0%)	3 (2.1%)
Unclear	16 (11%)	147 (30.2%)	66 (27.5%)	41 (28.9%)
Total	146	486	240	142

Note: Percentages indicate the percentage of within-country totals

In contrast, the BECG and the OC demonstrate a significant degree of consistency in their treatment of knowledge, with ~50% of all knowledge mentions in both curricula portraying knowledge not as an end in itself, but as a means to some further educational goals. It is noteworthy that references to the instrumental use of knowledge in the OC are most prevalent in statements outlining evaluation strategies and assessment criteria, e.g.:

> [achievement at level 4] indicates that the student … demonstrates the ability to use the knowledge and skills specified for that grade in more sophisticated ways than a student achieving at level 3 (OC: Mathematics, p.19)

The use of knowledge as a basis for evaluating and, perhaps more importantly, validating students' educational progress creates a picture of knowledge as a means of climbing the educational ladder and moving through the school, thus further reinforcing the framing of knowledge in essentially instrumental terms.

2. b. Balance between the acquisition of knowledge and the development of skills/competencies/dispositions

For each of the four curricula, we address this question by considering the relative numbers and proportions of statements focussing entirely on knowledge versus those that place knowledge among a wider set of curriculum elements, including understanding, skills, competencies, capabilities, dispositions, values, and attitudes. Table 4 shows this data.

Table 4. Positioning of knowledge

	NCE	OC	AC	BECG
Exclusive mention	95 (65.1%)	77 (15.8%)	60 (25.0%)	54 (38.0%)
Part of a set	51 (34.9%)	409 (84.2%)	180 (75.0%)	88 (62.0%)

Note: Percentages indicate the percentage of within-country totals

There is a strong tendency in the NCE to prioritise knowledge over other curriculum elements, as evidenced by a high proportion of exclusive knowledge mentions in the document (~65%). While disciplinary understanding and skills receive substantial attention alongside knowledge, generic skills, values, and attitudes are clearly less prominent in the NCE. The fact that there are only two references to values and three mentions of attitudes across the entire document indicates that the NCE is focussed firmly on the cognitive development of students and lacks the intention to position the curriculum more widely as a driver of children's personal and social growth.

This contrasts sharply with the BECG's clearly stated aim of promoting holistic development and learning of pupils by foregrounding generic skills, values, and attitudes. The following statements are indicative:

> …increased efforts should be made to develop students' generic skills, values and attitudes to help students achieve a balanced development (BECG, Ch.1.5.2, p.8)

> Assessment should not be confined to knowledge. Students' skills, values and attitudes should also be assessed (BECG, Ch.3.5.3, p.10)

Australia's and Ontario's curricula are also characterised by a low number of exclusive references to knowledge. Whilst knowledge is accorded high priority in both curricula, it is

more often than not placed alongside other curriculum elements, primarily understanding and skills. However, this reduced emphasis on knowledge as the single most important curriculum element is not evidence of a shift towards what Young (2008) refers to as "genericism", i.e. prioritisation of domain-independent over subject-specific learning. Both the AC and the OC emphasise *disciplinary* as opposed to *generic* understanding and skills, for example:

> The Native Language curriculum emphasizes the basic knowledge and skills that students must develop in order to write clearly and correctly (OC: Native Languages, p.16)

> The science and technology curriculum expectations are organized in four strands, which are the major areas of knowledge and skills in the science and technology curriculum (OC: Science and Technology, p.11)

Whilst their distinct focus on disciplinary skills indicates that the AC and the OC prioritise the academic achievement of students, both curricula demonstrate recognition of the need to help pupils to develop not only intellectually, but also personally and socially. To this end, the OC includes *"Creating Pathways to Success: An Education and Career/Life Planning Program for Ontario Schools"* (Ontario Ministry of Education, 2013) and *"Growing Success: Assessment, Evaluation, and Reporting in Ontario Schools"* (Ontario Ministry of Education, 2010) documents which extend the focus of school education beyond disciplinary knowledge and skills to include generic skills and competencies. In the AC, this function is served by the General Capabilities and Cross-curriculum Priorities elements.

2. c. Knowledge and the frameworks by which the curriculum is presented

Our analysis suggests that knowledge plays a key role in the organisation of Australia's, Ontario's, and England's curricula. This is apparent, for example, through their use of traditional subject areas as a basis for the selection and organisation of curriculum content. Although the AC has a three-dimensional design comprising Learning Areas, General Capabilities, and Cross-curriculum Priorities, the fact that the latter two components do not constitute separate curricula and are only addressed through the content of the Learning Areas, indicates a dominant role of knowledge in the curriculum design framework. Knowledge is also a fundamental focus of the learning aims, goals, and outcomes set out by Australia's, Ontario's, and England's curricula, as the quotes below illustrate:

> The Australian Curriculum: Mathematics provides students with essential mathematical skills and knowledge in number and algebra, measurement and geometry, and statistics and probability (AC: Mathematics - How the Subject Works)

> Pupils use standard units of measurement with increasing accuracy, using their knowledge of the number system (NCE, p.11)

The OC is especially emphatic that acquisition of subject-specific knowledge remains an integral part of all learning in school:

> In integrated learning, teachers need to ensure that the specific knowledge and skills for each subject are taught (OC: Social Studies, p.37)

Further, the three curricula are characterised by a high level of specification of the essential knowledge that should be taught to students in each grade. This is particularly evident at

the level of statements outlining curriculum expectations in various learning areas/subjects, e.g.:

> By the end of Grade 2, students will: count forward by 1's,2's,5's,10's, and 25's to 200, using number lines and hundreds charts, starting from multiples of 1, 2, 5, and 10 (OC: Mathematics, p.43)

> Pupils should be taught to: apply their growing knowledge of root words, prefixes and suffixes (etymology and morphology) as listed in English Appendix 1, both to read aloud and to understand the meaning of new words they meet (NCE, p.35)

While discipline-based learning areas also play an important role in structuring Hong Kong's curriculum, the BECG repeatedly stresses that "knowledge, skills, values and attitudes should be of equal importance". Schools are expected to treat Key Learning Areas as a medium for "connecting knowledge, skills, values and attitudes" and design learning activities and outcomes around all three components as opposed to using subjects as the sole basis for organising the curriculum. Thus, the BECG treats knowledge as a complementary rather than dominant element in the curriculum design framework.

2. d. Knowledge acquisition and stages of primary education

Our analysis shows no evidence that the four national curricula tend to put greater or lesser emphasis on knowledge in certain stages of primary education. In fact, the NCE explicitly highlights the need to maintain the focus on the acquisition and progressive building of knowledge by students:

> As in earlier years, pupils should continue to be taught to understand and apply the concepts of word structure... (NCE, p.46)

> Pupils should continue to add to their knowledge of linguistic terms… (NCE, p.48)

While the other three curricula do not overtly call for a continually increased or reduced emphasis on knowledge, none of them is characterised by inconsistent treatment of knowledge in different stages of primary education. Thus, the NCE, the AC, and the OC pay continuous attention to knowledge acquisition across all year levels/grades, just like the BECG's focus remains on the integration of knowledge, skills, values and attitudes in all stages of the curriculum.

2. e. Connections with knowledge acquisition in curriculum frameworks for previous learning (preschool/kindergarten) and future learning (lower secondary)

Our analysis indicates that England's, Ontario's, and Hong Kong's curricula seek to establish tangible connections between the bodies of knowledge acquired by students in different stages of school education. The NCE and the BECG put a strong emphasis on the importance of building upon previously gained knowledge for ensuring sustained learning progression and smooth educational transitions for students, as could be seen in the following quotes:

> During year 1, teachers should build on work from the Early Years Foundation Stage… (NCE, p.19)

> At the primary level, schools should provide a balanced curriculum to develop students' knowledge, skills and positive values and attitudes, as well as to help them build a solid foundation for advancing into the secondary stage (BECG, Ch.9.5.3, p.13)

In the OC, this emphasis is somewhat less pronounced: across all subject guides, we find only one statement explicitly demonstrating consideration of the links between previous and future learning:

> The expectations that form the basis of the secondary school curriculum build on the knowledge and skills that students acquire in their elementary programs (OC: Native Languages, p.6)

However, the OC's recognition of the role of previously gained knowledge in facilitating knowledge building becomes apparent through multiple references to prior knowledge, especially in statements of guidance, e.g.:

> [Teachers] can assist students in accessing prior knowledge and connecting it to new concepts learned as well as consolidating their understanding (OC: Arts, p.40).

In contrast, the AC displays no explicit intention to establish meaningful connections between what students have already learned and what they are expected to learn, as demonstrated by the absence of references in the primary curriculum to prior knowledge or to pre-primary or secondary programmes. In some statements, we discern appreciation of the fact that knowledge learning is a step-by-step process and that ensuring its continuity is essential for enabling students' progression from one stage to another. For example:

> These key ideas are designed to support the coherence and developmental sequence of science knowledge within and across year levels (AC: Science – How the Subject Works)

Yet overall, the AC does very little to connect bodies of knowledge from different stages of school education or provide guidance for practitioners on how this can be done.

3. Implications for curriculum design, curriculum development and curriculum implementation

The National Curriculum in England is a curriculum of traditional academic subjects with a strong emphasis on disciplinary knowledge. The Australian Curriculum and the Ontario Curriculum are also best described as knowledge-oriented curricula, with subject-based learning areas being their main feature. While the intention to help students progress intellectually but also in terms of overall personal and social development can be clearly traced in the AC and the OC, it is quite apparent that disciplinary learning, of which knowledge acquisition is a key focus, receives higher priority in both curricula. In contrast in the BECG, knowledge is not seen as the most important element in the primary curriculum. Instead, it points schools in the direction of a particular framework of skills, values, and attitudes with an instrumental and normative focus on helping students to become well-rounded individuals and contributing members of society.

Knowledge in the curriculum should fundamentally be focused on 'understanding'. The narrower focus on facts to be acquired is a necessary, but far from sufficient aspect of knowledge. Understanding includes acquisition of relevant elements such as facts and

skills, but also requires a more holistic appreciation of areas of learning, whether these are traditional subjects or other ways of organising curriculum content. Ultimately, understanding also includes the appreciation that knowledge is fallible, that knowledge has to be warranted, and that understanding of any topic exists at multiple levels from novice level to expert level. Understanding at higher levels of learning includes the idea that areas of knowledge can be selected, emphasised, and deployed for socio-political purposes. And it is in this where the idea of powerful knowledge is significant. It is not so much that pupils should acquire certain knowledge because it is 'better' than other knowledge, but more that an appreciation of the ways in which knowledge is implicated in social advancement should be inculcated, alongside the understanding that knowledge is infinite and that the ability to locate and critique knowledge is more important than undue emphasis on the acquisition of canons of knowledge.

The infinite nature of knowledge can be linked with the necessity for pupils to have regular opportunities to make choices, i.e. be offered opportunities to explore areas of personal interest, for example to make selections of knowledge based on criteria that they establish in relation to investigations/research into topics of personal interest. The approach to knowledge should also explicitly encourage critique and testing of knowledge in the context of active learning activities in order to understand the ways in which knowledge is warranted. The most powerful curricula will rigorously and constantly balance opportunities for pupils' ownership of knowledge with the introduction to areas of knowledge that are not familiar to pupils: as much as possible derived from knowledge at the frontiers of human understanding. A coherent and consistent emphasis on understanding (including the word itself) should be the priority more than an emphasis on knowledge for the sake of knowledge itself, for example, as seen too much in the uneasy contrasts between the learning of facts, such as grammatical technical terms, versus some requirements that suggest deeper learning in England's 'knowledge-based curriculum'. All curricula, indeed all teaching, include engagement with knowledge of some kind, hence the specification of a knowledge-based curriculum is a distortion.

The emphasis on the development of positive attitudes to learning, through an emphasis on investigation linked naturally with the development of necessary knowledge, e.g. in the Hong Kong curriculum, is an important facet that should be a driver in any 21st century curriculum. But while the idea of collaboration with peers to co-construct knowledge is also important, a lack of distinction between disciplinary knowledge and non-disciplinary knowledge in a curriculum is not optimal. A curriculum should have authentic and appropriate links with the most up to date knowledge that is available. However, this requires some consensus on the selection of knowledge that is most appropriate for pupils' developmental stages and their interests. It is in this selection where the democratic process to build national curricula is so important. And at the national curriculum level, decisions made about the knowledge to be covered in a curriculum are nearly always politically influenced decisions. It is important that democratic processes of curriculum building ensure that as far as possible the knowledge to be addressed reflects a balance between disciplinary knowledge and non-disciplinary knowledge and allows for building explicitly on pupils' interests periodically throughout their school career.

It is necessary to have clarity about the kind of knowledge that should inform teachers' pedagogy versus knowledge that pupils are expected to acquire directly as specified as content in the curriculum. For example, sufficient understanding by teachers of cognitive processes for reading can be used to improve reading curricula, but this does not equate simply to the teaching of related factual knowledge to pupils. This balance between disciplinary knowledge and non-disciplinary knowledge links with the importance of balance

between intrinsically valuable knowledge and instrumentally valuable knowledge. Emphasis on skills as part of understanding is also vital, and the development of values and attitudes is necessary for a holistic education. The explicit linking of knowledge with understanding and skills that is a feature of the Australian and Ontario curricula, and the avoidance of undue separation of knowledge, is significant. As is the recognition that curricula should include appropriate emphasis on the self and on social understanding.

Appropriate representation of knowledge in curricula requires clear specification of what is to be taught. This should be based appropriately on knowledge in the different disciplines with due consideration for pupils' developmental stages. But the nature of the specification of knowledge matters. An emphasis on understanding requires the combination of skills, factual knowledge *and* social elements, as can be seen in the designation of knowledge as complementary rather than dominant in the Hong Kong curriculum. Appropriate representation of knowledge as understanding suggests overall curriculum structures based on areas of learning rather than on historic traditional subjects, but it may be possible to structure a curriculum through the combination of areas of learning and some traditional subjects. For example, 'language' is an entirely appropriate title and focus for a curriculum area, as it includes reading, writing, native language learning, other language learning, socio-linguistic awareness and study of literature. Contrast this with mathematics which may benefit from representation as a traditional subject in view of its particular demands and more clearly defined boundaries than other areas of learning, notwithstanding its cross-curricular links with natural sciences.

This kind of contrasting representation of areas of the curriculum in a school curriculum is reflected at the highest levels of the disciplines, for example in the ways in which research assessments of disciplines at national and state levels are structured. The relatively tight boundaries of areas such as natural sciences contrast with the more overt multi-disciplinarity of the social sciences and, to some degree, the arts. Consideration of precisely the ways in which disciplines are represented and enacted in the academy and in wider society, including as part of commerce, can and should influence appropriate, logical and authentic links with disciplinary knowledge in school curricula, as opposed to ideological views that result in curricula structured according to 'traditional' school subjects as a default position.

The combining of the Dewian idea that knowledge is *constructed*, by learners and teachers, with Young's and Muller's idea that knowledge is *real* because certain kinds of knowledge are seen by society as necessary for advancement, is the beginning of a realisation of the rapprochement in crisis in curriculum studies that Muller referred to. As we have tried to demonstrate in this report, this rapprochement is also a potentially new way to establish curricula in the 21st century if a sophisticated balance can be found between knowledge specified by national curricula and the breadth of knowledge that learners can bring, and have access to, from outside schools.

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Appendix 1 - Coding Framework

A coding framework was developed to analyse how knowledge was represented in the national curricula through examining:

1) The types of statements in which the terms “knowledge” and “know” appeared. The types of statements identified as prevalent across the four national curricula include:

    a) Statement of intent: statements outlining learning aims and objectives, both overall and for particular learning areas, e.g.:

    The Australian Curriculum: The Arts aims to develop students’: creativity, critical thinking, aesthetic knowledge and understanding about arts practices, through making and responding to artworks with increasing self-confidence (AC: The Arts, How the Subject Works)

    b) Statement of guidance: statements outlining recommendations and guidance for practitioners, e.g.:

    Pupils should be taught to: ask relevant questions to extend their understanding and knowledge (NCE, p.17)

    c) Statement of context: statements describing actual and desirable learning contexts, e.g.:

    English language learners (children who are learning English as a second or additional language in English-language schools) bring a rich diversity of background knowledge and experience to the classroom (OC: Science and Technology, p.33)

    d) Statement of learning process: statements describing different aspects of the learning process, e.g. learning strategies / activities and students’ experiences of them, e.g.:

    As students make artworks they actively respond to their developing artwork and the artworks of others; as students respond to artworks they draw on the knowledge, understanding and skills acquired through their experiences in making artworks (AC: The Arts: How the Subject Works)

    e) Statement of outcome: statements outlining overall and specific learning outcomes, e.g.:

    In addition to acquiring knowledge in class, students are expected to develop learning to learn capabilities as well as positive values and attitudes for achieving the educational aims of whole-person development and life-long learning (BECG, Preamble, p.1)

f) Statement of process and outcome: statements integrating specification of learning outcomes with identification of learning experiences through which these outcomes can be achieved, e.g.:

> In Dance, students develop kinaesthetic knowledge through the development of dance knowledge and skills and their engagement with the materials of dance (AC: The Arts, How the Subject Works)

2) The type of knowledge referred to. The key distinction was made between disciplinary knowledge, i.e. knowledge that is strongly associated with academic subjects or areas of study, and non-disciplinary knowledge, i.e. that which is independent of academic disciplines and can be gained through day-to-day experiences (commonly referred to as "common", "life", or "everyday" knowledge). The following quote from Hong Kong's Basic Education Curriculum Guide refers precisely to the latter type:

> Every student has their unique personal experiences and life knowledge (BECG, Ch.3.4.1; p.4)

In considering the types of knowledge foregrounded in the curriculum documents, we followed an approach whereby knowledge mentions appearing in statements evidently referring to subject-specific knowledge, even if this was not stated explicitly, were categorised as disciplinary. The following quote provides an example of such a statement:

> Learning in the arts cannot be viewed as merely the learning of facts, but must focus on developing students' knowledge and skills in hands-on, age-appropriate ways (OC: Arts, p.13)

This approach enabled identification of a significantly larger number of references to disciplinary knowledge than the national curricula might seem to contain upon a more superficial inspection.

3) The implied value of knowledge. This category is concerned with the curricula's perspectives on the value of knowledge and the purpose of knowledge acquisition. It is meant to provide insight into the kinds of justifications invoked in the national curricula for making knowledge an important constituting element of the school curriculum. Where relevant, knowledge mentions were categorised according to whether they framed knowledge as having intrinsic (knowledge as an end in itself) or instrumental (knowledge as a means to some further ends) value. The following quotes exemplify both framings:

> All pupils should be enabled to participate in and gain knowledge, skills and understanding associated with the artistic practice of drama (knowledge as an end, NCE, p.14)

> The content develops knowledge, understanding and skills to enable students to critically engage with a range of health focus areas and issues (knowledge as a means, AC: Health and Physical Education, How the Subject Works)

4) The positioning of mentions of knowledge in relation to other curriculum elements. We yield insight into this question by considering the relative numbers and

proportions of statements focussing entirely on knowledge versus those that in which knowledge was placed among other curriculum elements such as understanding, skills, competencies, capabilities, dispositions, values, and attitudes.

Coding framework for analysis of knowledge in the primary curriculum

Knowledge	Type	Disciplinary
		Non-disciplinary
	Statement type	Statement of intent
		Statement of guidance
		Statement of outcome
		Statement of context
		Statement of learning process
		Statement of process and outcome
	Implied value	Intrinsic
		Instrumental
	Positioning	Exclusive mention
		Part of a set

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Appendix 2 - Analysis of representation of knowledge in the Australian Curriculum

Australia's curriculum framework consists of three major elements, i.e. Learning Areas, General Capabilities, and Cross-Curriculum Priorities.

Learning Areas, of which there are eight (English, Mathematics, Science, Health and Physical Education, Humanities and Social Sciences, The Arts, Technologies, and Languages, the latter four comprising multiple subjects), describe disciplinary knowledge, skills, and understanding that students are expected to acquire from Foundation to Year 10.

General Capabilities in the Australian Curriculum (AC) are defined in terms of the knowledge, skills, behaviours, and dispositions that enable students "to live and work successfully in the twenty-first century". The AC identifies seven such capabilities: Literacy, Numeracy, ICT Capability, Critical and Creative Thinking, Personal and Social Capability, Ethical Understanding, and Intercultural Understanding.

Cross-curriculum Priorities are focussed on helping students to develop knowledge, understanding, and skills in three particular areas, namely Aboriginal and Torres Strait Islander Histories and Cultures, Asia and Australia's Engagement with Asia, and Sustainability, which are considered essential for enabling young Australians to effectively engage with the world at the national, regional, and global levels.

Curriculum structure - to what extent does knowledge frame the curriculum?

The AC has a three-dimensional design intended to achieve integration of the following elements:

- disciplinary literacy, defined in terms of confluence of subject-specific knowledge, understanding, and skills
- general capabilities considered essential and relevant to all learning areas
- cross-curriculum priorities focussed on helping young Australians to become good citizens of the state and responsible members of a global community

However, despite the stated goal of creating a balanced curriculum that gives equal weight to all three dimensions, the AC appears to accord greater importance to disciplinary learning. This becomes apparent through the fact that General Capabilities and Cross-curriculum Priorities do not constitute separate curricula and are addressed through the content of the learning areas. Both elements are developed *via* rather than along with or in addition to disciplinary learning, and their presence is contingent on their relevance to the learning areas. This means that knowledge, and disciplinary knowledge in particular, constitutes a central element in the curriculum design framework.
That knowledge serves as the main basis for organising the curriculum is revealed by quote 1:

> (1) The knowledge and understanding strand, through the four sub-strands, is developed year by year and provides the contexts through which particular skills are developed (AC: Humanities and Social Sciences - How the Subject Works)

Knowledge is also a key focus of the learning aims, goals, and outcomes set out by the AC, quotes 2 and 3 illustrate:

> (2) The Australian Curriculum: Mathematics provides students with essential mathematical skills and knowledge in number and algebra, measurement and

geometry, and statistics and probability (AC: Mathematics - How the Subject Works)

(3) In Dance, students develop kinaesthetic knowledge through the development of dance knowledge and skills and their engagement with the materials of dance (AC: Dance - How the Subject Works)

The importance of disciplinary knowledge in the AC becomes apparent on reviewing individual programmes of study for the learning areas which are characterised by a high level of specification of the subject content that should be taught to pupils based on their year level. For example, by the end of year 4, students are expected to:

(4) Understand how to use knowledge of letter patterns including double letters, spelling generalisations, morphemic families, common prefixes and suffixes and origins to spell more complex words (AC: English - Curriculum F-10)

(5) Find unknown quantities in number sentences involving addition and subtraction and identify equivalent number sentences involving addition and subtraction (AC: Mathematics - Curriculum F-10)

(6) Identify intended purposes and meanings of artworks using visual arts terminology to compare artworks, starting with visual artworks in Australia including visual artworks of Aboriginal and Torres Strait Islander Peoples (AC: Visual Arts - Curriculum F-10)

Overall, we can state that knowledge plays an essential role in the AC's structure and content. Although disciplinary knowledge is not explicitly identified as the single most important curriculum element, it remains a key focus of the intended aims, goals, and outcomes of instruction in all learning areas. The fact that General Capabilities and Cross-curriculum Priorities are not addressed independently but integrated within the content of the learning areas indicates their subordinate position in relation to disciplinary knowledge.

Frequency and type of references to knowledge

In total, 240 references to knowledge were extracted and analysed in order to understand the representation of knowledge in Australia's curriculum policy documentation. Table 1 outlines the numbers and proportions of different types of statements with knowledge mentions included in the Learning Area, General Capabilities, and Cross-curriculum Priorities guides.

Table 1. Types of statements referring to knowledge

Statement type	Frequency	Percentage
Curriculum intent	46	19.2%
Practitioner guidance	101	42.1%
Learning process	11	4.6%
Learning outcome	48	20.0%
Learning process and outcome	34	14.2%
Total	240	100%

Table 1 shows that Australia's curriculum documents have a strong tendency to position knowledge in statements providing recommendations and guidance for practitioners,

revealing the intention to ensure the continued presence of knowledge in teaching, learning, and assessment in schools. Quotes 7, 8, and 9 illustrate this motive:

(7) Teachers can select Technologies-specific content from the Knowledge and Understanding strand and students can apply skills from the Processes and Production Skills strand to that content (AC: Technologies – How the Learning Area Works)

(8) The content in the Language, Literature and Literacy strands is key to developing and sharing knowledge about social, economic and ecological systems and world views that promote social justice (AC: Cross-curriculum Priorities - Sustainability)

(9) The 12 focus areas provide the breadth of learning across Foundation to Year 10 that must be taught for students to acquire and demonstrate the knowledge, understanding and skills described in the achievement standard for each band of learning (AC: Health and Physical Education - How the Subject Works)

Further, knowledge mentions are also prevalent in statements specifying intended learning outcomes (20%), followed closely by statements of curriculum intent (~19%). This is consistent with the AC's overall framing of knowledge as a fundamental focus of the key aims and outcomes of school education. References to knowledge are noticeably less frequent in statements describing the learning process and those that integrate specification of learning outcomes with identification of experiences through which these outcomes can be achieved. Thus, while the AC is characterised by a high level of input regulation of the curriculum (evinced by the detailed specification of the important content to be taught in each learning area), it is less prescriptive when it comes to defining which activities are most appropriate for achieving the specified learning goals and objectives. This is indicative of the policy intention to regulate curriculum design, whilst leaving practitioners more room for manoeuvre in relation to its delivery.

Types of knowledge foregrounded in the curriculum

The first important observation in relation to the types of knowledge foregrounded in the AC is that most knowledge mentions allow to define whether they refer to disciplinary or non-disciplinary knowledge, even if this distinction is not made explicit, as in quote 10:

(10) [Students] develop knowledge, understanding and skills as they learn and apply techniques and processes using materials to achieve their intentions in two-dimensional (2D), three-dimensional (3D) and four-dimensional (4D) forms (AC: Visual Arts – How the Subject Works)

The low number of statements in which the type of knowledge remains unclear (~13%) suggests lack of intention to erase the boundaries between academic and everyday knowledge and thus put them on a more equal footing. Instead, disciplinary knowledge receives overwhelming attention in Australia's curriculum documents, as evinced by the frequency with which it is mentioned (182 disciplinary as opposed to 26 non-disciplinary knowledge mentions). Table 2 demonstrates this disparity, while quotes 11, 12, and 13 illustrate the messages conveyed by the AC about the importance of disciplinary knowledge in various learning areas.

Table 2. Disciplinary vs non-disciplinary knowledge mentions

Knowledge type	Frequency	Percentage

Disciplinary	182	75.8%
Non-disciplinary	26	10.8%
Unspecified	32	13.3%
Total	240	100%

(11) The development of aesthetic knowledge in Media Arts rewards students' curiosity and creative exploits (AC: Media Arts - How the Subject Works)

(12) Knowledge of [engineering] principles and systems enables the design and production of sustainable, engineered solutions (AC: Design and Technologies - How the Subject Works)

(13) The application of phonemic awareness and phonic knowledge to the development of reading, especially from Foundation to Year 2, is of critical importance (AC: English - How the Subject Works)

While the high level of attention given to disciplinary knowledge is consistent with the nature and purpose of Learning Area guides, the fact that the General Capabilities and Cross-curriculum Priorities documents do not weaken the AC's emphasis on disciplinary knowledge is noteworthy, for it implies a stronger focus on the intellectual development of students defined primarily in terms of disciplinary learning. This becomes further apparent upon examining the so-called Learning Continua - the achievement charts to be used by teachers in assessing students' progress with respect to General Capabilities.
Across all the Learning Continua we find only one explicit reference to non-disciplinary knowledge, which appears in the Critical and Creative Thinking Learning Continuum:

(14) Typically, by the end of Year 4, students pose questions to expand their knowledge about the world (AC: General Capabilities - Critical and Creative Thinking learning continuum)

The fact that Ethical Understanding, Intercultural Understanding, and Personal and Social Capability Learning Continua do not contain any references to non-disciplinary knowledge is especially noteworthy considering that these capability areas are intended to prepare students for a successful life outside the school. It would, therefore, have been natural to expect that relevant Learning Continua would have had a special emphasis on what can be called "world", "life", or "everyday" knowledge, yet we find no evidence thereof.

Implied value of knowledge

In considering the question about the ways in which the prioritised status of knowledge is justified in Australia's curriculum documentation, we make the following observations. When it comes to the implied value of knowledge and, concomitantly, the intended purpose of knowledge acquisition, the AC does not exhibit a clear tendency towards framing knowledge as either intrinsically or instrumentally good. As Table 3 shows, all knowledge mentions subjected to content analysis are divided almost equally between "intrinsic", "instrumental", and "unclear" categories. Quotes 15, 16, and 17 provide examples of each of these frames, respectively.

Table 3. Implied value of knowledge

Value type	Frequency	Percentage
Intrinsic	68	28.3%

Instrumental	94	39.2%
Intrinsic and instrumental	12	5.0%
Unclear	66	27.5%
Total	240	100.0%

(15) The information below outlines the knowledge and skills that students need to develop in drama (AC: Drama - How the Subject Works).

(16) In an increasingly technological and complex world, it is important to develop knowledge and confidence to critically analyse and creatively respond to design challenges (AC: Design and Technologies - How the Subject Works).

(17) Students develop skills in choosing appropriate procedures; carrying out procedures flexibly, accurately, efficiently and appropriately; and recalling factual knowledge and concepts readily (AC: Mathematics – How the Subject Works)

There is a slightly more pronounced emphasis on the instrumental value of knowledge, a pattern driven primarily by the Technologies and Health and PE Learning Area guides. Overall, however, the AC sends inconsistent messages about the value of knowledge; such ambiguous framing makes it difficult to understand the AC's rationale for making disciplinary knowledge an essential component of the curriculum and a key focus of instruction and assessment in schools.

Positioning of knowledge

Despite a high level of importance accorded to knowledge, the AC contains a low number of statements focussing solely on knowledge. As Table 4 shows, the vast majority of knowledge mentions are "set" mentions which place knowledge alongside other curriculum elements, mainly understanding and skills. Quotes 18 and 19 provide examples of exclusive and set mentions of knowledge in the Cross-curriculum Priorities documents.

Table 4. Positioning of knowledge

Positioning	Frequency	Percentage
Exclusive mention	60	25.0%
Part of a set	180	75.0%
Total	240	100%

(18) Students draw on knowledge of the Asia region, including literature, to influence and enhance their own creative pursuits (AC: Cross-curriculum Priorities - Asia and Australia's Engagement with Asia)

(19) The curriculum focuses on the knowledge, understanding and skills necessary to design for effective sustainability action taking into account issues such as resource depletion and climate change (AC: Cross-curriculum Priorities - Sustainability)

It is important to note that the AC's reduced emphasis on knowledge as the *single* most important curriculum element is not evidence of a shift towards "genericism" (Young, 2008), or prioritisation of domain-independent over disciplinary learning. In fact, Australia's curriculum documents foreground subject-specific understanding and skills which, together

with subject knowledge, are seen as essential components of disciplinary learning. Noteworthy is the AC's distinctive focus on understanding, which is construed in terms of the ability to use and apply the acquired knowledge, and which is frequently placed alongside knowledge in statements of curriculum intent (quote 20) and learning outcomes (quote 21).

> (20) This strand focuses on developing the underpinning knowledge and understanding of technologies (materials, systems, components, tools and equipment) across technologies contexts and developing understanding of the relationship between technologies and society (AC: Design and Technologies - How the Subject Works)
>
> (21) [Students] acquire knowledge, skills and understanding specific to The Arts subjects and develop critical understanding that informs decision-making and aesthetic choices (AC: The Arts - How the Learning Area Works)

While the inclusion of General Capabilities and Cross-curriculum Priorities into the AC backs up the intention to enable and promote not only the intellectual growth of students, but also their development as responsible individuals and contributing members of society, both components achieve very little in terms of putting values, dispositions, and attitudes on a par with knowledge. Across all Learning Areas, General Capabilities, and Cross-curriculum Priorities guides we find only ten statements placing knowledge and attitudes/dispositions among the same set; for values, the relevant number is as low as five.

Concluding remarks

Overall, we find that Australia's curriculum documentation is characterised by a continued emphasis on disciplinary knowledge. Subject-based learning areas represent a main feature of the Australian Curriculum framework, which is a strong indication that disciplinary knowledge serves as a fundamental organising principle and essential component of the school curriculum. While the AC's stated intention to help students progress not only intellectually, but also in terms of overall personal and social development is detectable in the three-dimensional curriculum design, it is also quite clear that disciplinary learning, of which acquisition of subject knowledge is a key focus, is accorded a higher priority in the Australian Curriculum framework.

There is a clear tendency in Australia's curriculum documents to place knowledge alongside other curriculum elements, especially understanding and skills. The AC's focus on knowledge, therefore, extends beyond merely ensuring that students learn relevant subject matter to helping them to engage with and apply the acquired knowledge in a reflexive, deliberate manner. At the same time, the AC lacks a coherent justificatory framework for the prominent place of knowledge in the curriculum and is characterised by mixed messages about the value of knowledge and the overarching purpose of knowledge acquisition.

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Appendix 3 - Analysis of representation of knowledge in the Ontario Curriculum

The Ontario Curriculum (OC) Grades 1-8 comprises eight separate documents which set out the curriculum expectations and programmes of study for various subjects (namely Math, Language, Native Languages, French, Arts, Science and Technology, Social Studies, Health and PE) at all eight grades. Each individual subject guide also provides general as well as subject-specific guidance and recommendations for practitioners on appropriate instructional and assessment strategies.

Curriculum structure - to what extent does knowledge frame the curriculum?

Knowledge and disciplinary knowledge in particular has a central place in the organisation of the OC. According to the *Ontario Schools: Policy and Program Requirements* (Ontario Ministry of Education, 2016), learning programmes in Ontario's English-language elementary schools must include the following disciplines: the arts; French as a second language; health and physical education; language; mathematics; science and technology; and social studies. The fact that Ontario's curriculum documentation consists of eight self-contained documents concerned with the content and delivery of programmes of study for separate, traditionally defined, and clearly circumscribed subjects is strongly indicative of the key role of disciplinary knowledge in structuring the curriculum. While recognising the importance of creating opportunities for students to integrate knowledge and skills across the curriculum, the OC subject guides instruct practitioners to ensure that integrated learning does not occur at the expense of students' acquisition of subject-specific knowledge, as quote 1 makes explicit:

1. In integrated learning, teachers need to ensure that the specific knowledge and skills for each subject are taught (OC: Social Studies, p.37)

The OC's intention to establish a strong connection between academic knowledge and the content of the school curriculum becomes further apparent upon closer scrutiny of individual subject guides, which are characterised by a high level of specification of disciplinary knowledge that should be taught to students in each grade. This is especially evident at the level of statements outlining specific curriculum expectations, as in quote 2:

2. By the end of Grade 2, students will: count forward by 1's,2's,5's,10's,and 25's to 200, using number lines and hundreds charts, starting from multiples of 1, 2, 5, and 10 (e.g., count by 5's from 15; count by 25's from 125 (OC: Mathematics, p.43)

Further, knowledge of content alongside the ability to apply knowledge and transfer it to new contexts are presented as major criteria for assessing educational progress. Importantly, sections of the subject guides outlining achievement charts to be used by teachers in assessing students' learning define knowledge as "subject-specific content acquired in each grade", making explicit the OC's emphasis on disciplinary as opposed to other types of knowledge.

Overall, the OC demonstrates reliance on traditionally defined subjects as a basis for structuring the curriculum and selecting the curriculum content. It is, therefore, best described as a knowledge-based curriculum with a strong foundation in traditional academic subjects.

Frequency and type of references to knowledge

Our search through the relevant sections of all eight OC subject guides returned 486 mentions of knowledge. Table 1 outlines the numbers and proportions of different types of statements in which knowledge was mentioned.

Table 1. Types of statements referring to knowledge

Statement type	Frequency	Percentage
Curriculum intent	28	5.8%
Learning outcome	29	6.0%
Learning process	16	3.3%
Learning context	6	1.2%
Learning process and outcome	25	5.1%
Practitioner guidance	382	78.6%
Total	486	100%

Our findings show that knowledge is most frequently mentioned in statements providing recommendations and guidance for practitioners on the development and implementation of various aspects of the curriculum, especially instructional and assessment strategies. Quotes 3, 4, and 5 exemplify this tendency:

3. Oral pre-reading activities should aim to build a bank of vocabulary, set the context for the topic, and relate texts to the students' experience or prior knowledge of the topic (OC: Native Languages, p.16)

4. …in the Knowledge and Understanding category, assessment of knowledge might focus on accuracy, and assessment of understanding might focus on the depth of an explanation (OC: Arts, p.33)

5. Teachers should use the descriptions to identify the level at which a student has achieved a particular expectation or group of expectations, in the appropriate category (or categories) of knowledge and skills (OC: Native Languages, p.13)

The fact that knowledge features prominently in descriptions of appropriate approaches to teaching and evaluating student learning indicates that the subject guides aim to secure the position of knowledge as a central element in the school curriculum. The positioning of knowledge in statements outlining curriculum intent, learning experiences, and learning outcomes (quote 6 and 7) further reveals the OC's intention to establish strong associations between knowledge and schooling.

6. Instruction in social studies, history, and geography should help students acquire the knowledge, skills, and attributes they need in order to achieve the curriculum expectations and to be able to think critically throughout their lives about current affairs and issues related to social studies, history, and geography (OC: Social Studies, p.35)

7. *As they express their initial thoughts, feelings, and ideas about music, analyse the musical choices that are made, and explore the context in which music was created, they will build the knowledge and language they need to communicate about music as well as through music (OC: Arts, p.17)*

Types of knowledge foregrounded in the curriculum

Table 2 illustrates that an overwhelming majority (over 80%) of references to knowledge in the OC subject guides refer to disciplinary knowledge.

Table 2. Disciplinary vs non-disciplinary knowledge mentions

Knowledge type	Frequency	Percentage
Disciplinary	397	81.5%
Non-disciplinary	42	8.6%
Unspecified	48	9.9%
Total	487	100%

A disproportionately high amount of attention allocated to disciplinary knowledge in Ontario's curriculum documents is consistent with their stated purpose to set out appropriate content and strategies for the delivery of instruction in particular academic subjects. The OC's strong focus on academic learning is accompanied by a recognition of the need to teach students to connect subject-specific knowledge to real-life situations (quotes 8 and 9) as well as some appreciation of the value of non-disciplinary knowledge (quote 10):

8. This focus on the sociolinguistic and cultural aspects of language allows students to apply their language knowledge in a variety of real-world situations and contexts (OC: French as a Second Language, p.8)

9. It is important, therefore, that students see science and technology in this wider context – as endeavours with important consequences for people and other living things – and that they learn to connect their knowledge of science and technology to the world beyond the school (OC: Science and Technology, p.5)

10. In addition to their learning experiences in the classroom, students should be encouraged to: seek out recreational reading materials and multimedia works in French, as well as in their first language, to extend their knowledge of the world around them (OC: French as a Second Language, p.12)

Implied value of knowledge

The OC subject guides demonstrate a significant degree of consistency in their framing of the value of knowledge. As Table 3 illustrates, over half of all knowledge mentions subjected to analysis place emphasis on the instrumental value of knowledge.

Table 3. Implied value of knowledge

Value type	Frequency	Percentage
Intrinsic	64	13.2%
Instrumental	254	52.3%
Intrinsic and instrumental	21	4.3%
Unclear	147	30.2%
Total	486	100%

Mentions framing knowledge as an instrumental good appear across all statement types, including statements of curriculum intent (quote 11), statements of learning outcomes (quotes 12 and 13), and statements of guidance (quote 14)

11. The Ontario curriculum focuses on developing the knowledge and skills that will enable students to become effective readers (OC: Language, p.10)

12. Students are expected to learn and use the creative process to help them acquire and apply knowledge and skills in the arts (OC: Arts, p.19)

13. The Reading strand has four overall expectations, as follows: students will use knowledge of words and cueing systems to read fluently (OC: Language, p.11)

14. Instruction in FSL should help students acquire the knowledge, skills, and attributes they need in order to achieve the curriculum expectations and to be able to enjoy communicating in French throughout their lives (OC: French as a Second Language, p.31)

It is noteworthy that references to knowledge as a means to an end are most prevalent in statements outlining evaluation strategies and assessment criteria, as exemplified by quote 15:

15. It [achievement at level 4] indicates that the student has achieved all or almost all of the expectations for that grade, and that he or she demonstrates the ability to use the knowledge and skills specified for that grade in more sophisticated ways than a student achieving at level 3 (OC: Mathematics, p.19)

The focus on knowledge as a basis for evaluating and, perhaps more importantly, validating students' educational progress contributes to the representation of knowledge as merely a means of climbing the educational ladder and progressing through the school. There is little recognition of the intrinsic value of knowledge in the OC subject guides, as evinced by a low number of references to knowledge as an end in itself (just over ~10%). This further reinforces the framing of knowledge in largely instrumental terms.

Positioning of knowledge

It is significant that despite its apparently high status, knowledge is rarely mentioned on its own in the OC subject guides. As Table 4 illustrates, the documents contain a disproportionately low number of exclusive references to knowledge (~16% compared to ~ 84% "set" mentions) and display a strong tendency to place knowledge alongside other curricular elements, primarily skills.

Table 4. Positioning of knowledge

Positioning	Frequency	Percentage
Part of a set	409	84.2%
Exclusive mention	77	15.8%
Total	486	100%

These findings point to the OC's association with a wider trend in school education around the world to underscore the importance of skills development. However, a large amount of attention devoted to skills in the OC subject guides does not detract from but rather complements their strong focus on knowledge. Our analysis finds no evidence of Ontario's

curriculum policy moving towards what Young (2008) refers to as genericism - the modern tendency in school education to prioritise the development of generic skills over knowledge acquisition. The Ontario Curriculum is clearly a knowledge-based rather than a "technical-instrumentalist" (Moore & Young, 2001) curriculum.

Furthermore, rather than aiming at raising the profile of cross-disciplinary and soft skills (e.g. cooperation, teamwork), the OC subject guides place emphasis on academic skills considered essential for students' ability to achieve subject-specific learning outcomes. Quote 16 illustrates this priority:

16. The Native language curriculum emphasizes the basic knowledge and skills that students must develop in order to write clearly and correctly (OC: Native Languages, p.16)

Statements referring to cross-curriculum skills (quotes 17 and 18), whilst present in the OC subject guides, are substantially less prevalent and restricted primarily to the area of health, safety, and wellbeing:

17. The focus of the learning in this strand is not merely on health knowledge but rather on higher-level thinking connected to the application of skills for healthy living (OC: Health and Physical Education, p.34)

18. …students require the skills necessary to respond appropriately to situations that threaten their personal safety and well-being (OC: Health and Physical Education, p.36)

The OC subject guides' distinct focus on disciplinary skills indicates prioritisation of students' academic success and achievement of specified curriculum expectations. Considered alone, this would be suggestive of a narrow view of the purpose of schooling as restricted mostly to ensuring intellectual development and educational progress of students. However, Ontario's curriculum policy documentation also includes *"Creating Pathways to Success: An Education and Career/Life Planning Program for Ontario Schools"* (Ontario Ministry of Education, 2013) and "*Growing Success: Assessment, Evaluation, and Reporting in Ontario Schools"* (Ontario Ministry of Education, 2010) documents, which extend the focus of school education beyond acquisition of disciplinary knowledge and skills to include generic, domain-independent learning skills and work habits, namely "responsibility, organization, independent work, collaboration, initiative, self-regulation" (Ontario Ministry of Education, 2016, p. 26). The *"Creating Pathways to Success"* document provides guidelines on the development and implementation of the guidance and career education program comprising three key learning areas, including interpersonal development, i.e. "the development of the knowledge and skills needed in getting along with others" (Ontario Ministry of Education, 2016, p. 30). Thus, while the OC subject guides focus almost exclusively on the intellectual development and academic success of students, considered more broadly, Ontario's curriculum policy demonstrates recognition of the need to promote and facilitate the overall development of personality, participation in society, and employability in school pupils.

Concluding remarks

Overall, our analysis of representation of knowledge in the OC documentation reveals a number of important trends, including:

- focus on academic learning, understood in terms of acquisition of subject-specific knowledge and skills, as the central activity of the school;

- reliance on traditional academic subjects as a basis for structuring the curriculum and selecting the curriculum content;

- representation of knowledge, including both acquisition and application of knowledge, as a key criterion for assessing students' educational progress;

- framing of the value of knowledge and, consequently, the purpose of knowledge acquisition in largely instrumental terms;

- strong emphasis on developing skills *alongside* knowledge acquisition and prioritisation of academic over generic skills.

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Appendix 4 - Analysis of representation of knowledge in the National Curriculum in England

The National Curriculum is England's key curriculum document that all local-authority-maintained schools ought to follow. Written as a single document, it comprises both primary and secondary curriculum frameworks (the latter is to be accompanied by Religious Education and Sex Education) which set out the programmes of study and attainment targets for all national curriculum subjects. The National Curriculum is divided into four Key Stages - blocks of years representing educational milestones at which students' academic performance has to be formally assessed.

Curriculum structure - to what extent does knowledge frame the curriculum?

Our analysis indicates that disciplinary knowledge plays a key role in the framing of The National Curriculum in England (NCE). This is apparent through the positioning of knowledge in statements outlining overall curriculum intent, as in quotes 1 and 2:

> (1) The national curriculum provides pupils with an introduction to the essential knowledge that they need to be educated citizens (NCE, p.6)
>
> (2) The national curriculum provides an outline of core knowledge around which teachers can develop exciting and stimulating lessons to promote the development of pupils' knowledge, understanding and skills as part of the wider school curriculum (NCE, p.6)

The fact that knowledge is the first in a list of learning outcomes to be promoted by teachers and that it is considered essential for the development of students into "educated citizens" strongly indicates the NCE's intention to accord high priority to knowledge acquisition. The important role of disciplinary knowledge in the NCE is also apparent through the use of traditionally defined subject areas (English, Mathematics, Science, Art and Design, Computing, Design and Technology, Geography, History, Languages, Music, and Physical Education) as a basis for the selection and organisation of curriculum content.

The NCE is articulated in terms of educational goals that are both premised on as well as geared towards acquisition of knowledge (quote 2) and testable outcomes specified at the level of particular subjects and learning stages (quote 3, 4, and 5).

> (3) Pupils should be taught to: apply their growing knowledge of root words, prefixes and suffixes (etymology and morphology) as listed in English Appendix 1, both to read aloud and to understand the meaning of new words they meet (NCE, p.35).
>
> (4) By the end of year 2, pupils should know the number bonds to 20 and be precise in using and understanding place value (NCE, p.101)
>
> (5) Pupils should be taught about: a study of an aspect or theme in British history that extends pupils' chronological knowledge beyond 1066 (NCE, p.191).

While the NCE instructs practitioners to pay attention to increasing students' knowledge *across* the curriculum (quotes 6 and 7), on the whole, it cannot be regarded as an exemplar of a cross-curricular design. Careful consideration of relevant statements reveals that clearly demarcated traditional school subjects continue to be used as a means of organising curriculum content (quotes 8 and 9) and objectives (quote 10).

(6) All pupils must be encouraged to read widely across both fiction and non-fiction to develop their knowledge of themselves and the world in which they live, to establish an appreciation and love of reading, and to gain knowledge across the curriculum (NCE, p.14)

(7) The sooner that pupils can read well and do so frequently, the sooner they will be able to increase their vocabulary, comprehension and their knowledge across the wider curriculum (NCE, p.26)

(8) The programmes of study describe a sequence of knowledge and concepts (NCE, p.144)

(9) They acquire a broad range of subject knowledge and draw on disciplines such as mathematics, science, engineering, computing and art (NCE, p.180)

(10) By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study (NCE, p.180)

Frequency and type of references to knowledge

The NCE contains 146 references to knowledge spread across 201 pages. As illustrated in Table 1, the curriculum accords a high level of importance to knowledge in statements providing guidance and recommendations for practitioners (~69%) and, to a considerably lesser degree, statements outlining learning outcomes (~22%) and statements of curriculum intent (~10%).

Table 1. Types of statements referring to knowledge

Statement type	Frequency	Percentage
Practitioner guidance	100	68.5%
Curriculum intent	14	9.6%
Learning outcome	32	21.9%
Total	146	100%

It is noteworthy that two statement types, namely statements describing learning process and contexts, are not represented in the table. The absence of these types of statements in our analysis might be explained in the following ways: 1) the word knowledge simply does not appear in statements of learning process and contexts in the NCE; 2) the document contains very few, if any, such statements. The first of these explanations would suggest that the NCE does not aim to establish a strong connection between knowledge and learning process/contexts, while the second would be indicative of the document's low emphasis on the centrality of the learner.

Another important finding is that statements of guidance and outcomes are characterised by a high level of specification of disciplinary knowledge that should be taught to students at different stages, as illustrated by quotes 3, 4, and 5. A high level of prescriptiveness in relation to the subject content makes explicit the prioritisation of disciplinary knowledge in the curriculum. Arguably, it also implies a view of teachers as transmitters of knowledge rather than co-participants in the process of exploring and constructing knowledge alongside students and colleagues. However, it is noteworthy that the highly detailed

description of the intended outcomes of learning is not accompanied by the identification of the learning strategies and activities through which these outcomes might be achieved. Quote 11 represents a rare exception and gives an idea of what statements integrating specifications of desired learning outcomes and best ways to achieve them would look like:

> (11) Building this knowledge is best achieved through a focus on grammar within the teaching of reading, writing and speaking (NCE, p.74).

Thus, while there is a lack of school-level autonomy with respect to the selection of the curriculum content in the NCE, the document allows a certain degree of flexibility in relation to its delivery.

Types of knowledge foregrounded in the curriculum

Table 2 demonstrates that the NCE contains very few statements (11 out of 146) in which the type of knowledge remains unspecified. Most statements allow clearly distinguishing disciplinary from non-disciplinary knowledge mentions, the latter being disproportionately less frequent in the document (only ~1%).

Table 2. Disciplinary vs non-disciplinary knowledge mentions

Knowledge type	Frequency	Percentage
Disciplinary	133	91.1%
Non-disciplinary	2	1.4%
Unspecified	11	7.5%
Total	146	100%

Quotes 12 and 13 showcase the only two mentions of non-disciplinary knowledge found in the NCE:

> (12) Good comprehension draws from linguistic knowledge (in particular of vocabulary and grammar) and on knowledge of the world (NCE, p.14)

> (13) All pupils must be encouraged to read widely across both fiction and non-fiction to develop their knowledge of themselves and the world in which they live (…) (NCE, p.14)

The fact that an overwhelming majority of references to knowledge in the NCE explicitly refer to disciplinary knowledge indicates an intention to establish a strong relation between academic knowledge and the content of the curriculum. Quotes 14 and 15 support this conclusion:

> (14) Pupils should be taught to: read aloud books closely matched to their improving phonic knowledge, sounding out unfamiliar words accurately, automatically and without undue hesitation (NCE, p. 27)

> (15) Pupils should be taught to use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating (NCE, p.169)

Implied value of knowledge

The NCE is characterised by the prevalence of mixed messages about the value of knowledge. As Table 3 illustrates, the document contains a nearly identical number of references to knowledge as an end in its own right (quote 16) and as a means to some further educational goals (quote 17).

Table 3. Implied value of knowledge

Value type	Frequency	Percentage
Intrinsic	60	41.1%
Instrumental	58	39.7%
Intrinsic and instrumental	12	8.2%
Unclear	16	11.0%
Total	146	100%

> (16) Pupils should be taught to: ask relevant questions to extend their understanding and knowledge (NCE, p.17)
>
> (17) Pupils should be taught to: apply phonic knowledge and skills as the route to decode words (NCE, p.20).

A small number of statements frame knowledge as both intrinsically and instrumentally valuable (~8%) or do not allow distinguishing the two categories (11%), reinforcing the conclusion about the lack of clarity and coherence in regard to the value of knowledge in the NCE. The apparent inconsistency and ambiguity in the NCE's treatment of the purpose of knowledge acquisition suggests that the document either does not take any particular stance on the issue, or that it intends to put equal emphasis on both instrumental and intrinsic value of knowledge. In either case, the NCE's rationale for making knowledge a key focus of the curriculum remains unclear.

Positioning of knowledge

There is a clear tendency in the NCE to prioritise knowledge over other curriculum elements, as evidenced by a high number of exclusive knowledge mentions in the document (95, or ~65%). A relatively small number (51, or ~35%) of statements containing references to knowledge among a set of other curriculum aspects suggests that the NCE does not intend to put skills, values, and attitudes on a par with knowledge in the curriculum development framework. Table 4 reflects these priorities.

Table 4. Positioning of knowledge

Positioning	Frequency	Percentage
Exclusive mention	95	65.1%
Part of a set	51	34.9%
Total	146	100%

However, it might be argued that skills feature in the NCE in less explicit ways. If we accept the view that high-level knowledge is essentially the skill of being able to differentiate between different concepts (Gill & Thomson, 2012), the following statements (quotes 18 and 19) might be seen as intending to include skills in the specification of educational goals:

> (18) As in earlier years, pupils should continue to be taught to understand and apply the concepts of word structure so that they can draw on their knowledge of morphology and etymology to spell correctly (NCE, p.46)

> (19) The national curriculum for mathematics aims to ensure that all pupils: (…) develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately (NCE, p.99)

The emphasis on encouraging the development of deep conceptual understanding in students might also be indicative of the NCE's intention to promote an active form of pedagogy which prioritises reflexive engagement with knowledge over routinized acquisition of scientific concepts and facts (Young, 2007).

It is nonetheless quite clear that generic skills, values, and attitudes are downgraded in the NCE. The word "values" appears in the entire document only five times, and three of the five mentions refer to numerical values, as in quote 20:

> (20) Pupils should be taught to: solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts (NCE, p.138)

Similarly, there are only three references to attitudes across the whole NCE, and all three refer to attitudes towards learning activities (quote 21) rather than ways of thinking and feeling about important life-world issues, thereby reinforcing the curriculum's narrow focus on the intellectual development of students.

> (21) Pupils should be taught to: develop positive attitudes towards and stamina for writing (…) (NCE, p.31)

A very low emphasis on generic skills and near absence of references to values and attitudes in the NCE suggest a lack of intention to position the curriculum more widely as a driver of holistic personal and social development.

Concluding remarks

Based on our analysis, we draw the following key conclusions about the National Curriculum in England:

The National Curriculum in England is characterised by strong messages about the importance of knowledge in the curriculum. Acquisition of subject-specific knowledge is presented as the key purpose of education, while the shaping of an individual and the development of values and attributes in students is not seen as the responsibility of schools. The curriculum is focussed firmly on what students should know as opposed to how they should be in terms of dispositions, values, and attitudes.

The National Curriculum in England is a curriculum of traditional academic subjects. Its key rationale for the inclusion of content in programmes of study is that it reflects disciplinary knowledge and competencies, and its curriculum design framework is premised upon respect for traditional subject boundaries.

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Appendix 5 - Analysis of representation of knowledge in the Basic Education Curriculum Guide (Hong Kong)

Hong-Kong's Basic Education Curriculum Guide P1-P6 (BECG), a key piece of guidance for primary schools published in 2014 by the Curriculum Development Council, is an outcome of a ten-year curriculum reform process initiated as a result of the Education Commission recognising the need to review the existing curriculum to address the latest changes in society and needs of students. It can be seen as a macro-level framework which sets out directions and provides recommendations for schools on developing whole-school curriculum planning, learning and teaching strategies, resources, and assessment. Setting out educational intentions in broad terms while leaving the specifics to be defined at the school level, the BECG accords practitioners a high level of autonomy and flexibility in relation to the curriculum design and implementation. It is accompanied by eight individual documents which provide further guidance in relation to the Key Learning Areas (Chinese Language Education, English Language Education, Mathematics Education, Personal, Social and Humanities Education, Science Education, Technology Education, Arts Education, Physical Education) which, together with generic skills (the prioritised skills include Collaboration Skills, Communication Skills, Creativity, Critical Thinking Skills, Information Technology Skills, Numeracy Skills, Problem-solving Skills, Self-management Skills, Study Skills), and values and attitudes constitute the key elements of the BECG's curriculum framework.

Curriculum structure - to what extent does knowledge frame the curriculum?

Key Learning Areas (KLAs) represent an essential component in Hong Kong's curriculum development model. Students are expected to acquire a core of essential knowledge in the subject disciplines associated with these areas: *"[Students are expected to] master the basics of the eight Key Learning Areas to prepare for studying in secondary schools" (BECG, Ch.1.7, p.14)*. This statement indicates that acquisition of knowledge is viewed as important for students' educational progression. However, as already mentioned above, KLAs with their disciplinary underpinnings represent only one of the three key components in the curriculum design framework, and the BECG is emphatic that "*knowledge, skills, values and attitudes should be of equal importance" (BECG, Ch.1.5.2, p.8)*. Educational practitioners are expected to design curriculum experiences and outcomes around these three components as opposed to using subjects as the basis for structuring the curriculum.

Further, the BECG defines school-based curriculum in terms of the learning experiences offered to students and instructs schools to develop a holistic and balanced learning experience through the integration of classroom learning, practical experience, and learning environment. These three aspects are seen as closely connected, equally important, and mutually enhancing elements in the curriculum structure: "*classroom learning can lay a relevant knowledge base as the foundation for practical experience and learning environment, while learning atmosphere can also facilitate classroom learning and practical experience*" (BECG, Ch.3.3.3, p.9). This reinforces the representation of knowledge learning as a complementary rather than dominant activity in the school.

Frequency and type of references to knowledge

The first observation concerns the frequency of times that knowledge is mentioned in the BECG. The document makes multiples references to knowledge throughout most of its sections, including sections outlining overall curricular intent, sections aimed at framing

practice, sections related to particular learning areas, as well as those addressing questions of assessment and homework (the only section containing no references to students' knowledge is that which concerns teachers' continuing professional development). However, the total number of relevant knowledge mentions (i.e. excluding those referring to teacher knowledge) in the BECG was 141, which seems rather low considering the document's substantial page count (circa 450). Table 2 outlines the numbers and proportions of different types of statements in which knowledge was mentioned.

Table 1. Types of statements referring to knowledge

Statement type	Frequency	Percentage
Learning outcome	18	12.8%
Curriculum intent	27	18.4%
Practitioner guidance	84	59.6%
Learning context	7	5.0%
Learning process	6	4.3%
Total	142	100%

There is a clear tendency in the BECG for knowledge mentions to be prevalent in statements aimed at framing curriculum design and implementation: more than 50% of all references to knowledge were made in the context of providing guidance and recommendations for practitioners on curriculum content (quote 1), learning and teaching strategies (quote 2), activities and resources (quote 3):

(1) A school-based IT curriculum should not only develop students' IT knowledge and skills, but also foster their awareness of the various issues arising from the development of IT, and in particular the potential dangers and adverse effects induced by the improper use of computer networks (BECG, Ch.3.4.1, p.12)

(2) Project Learning provides an alternative learning experience to the learning of subject knowledge and creates space for students to engage in self-directed learning (BECG, Ch.3.3.1, p.2)

(3) Investigation activities not only help students increase their knowledge and enhance their learning capabilities, but also arouse their curiosity, increase their intrinsic motivation for learning, and above all, nurture a positive attitude towards learning (BECG, Ch.3C, p.1)

The fact that the overwhelming majority of knowledge mentions in the BECG appear in statements of guidance signals its intention to orientate educational practitioners towards a particular approach to knowledge that is conducive to achieving the aims of whole-person development and life-long learning.

Further analysis of the nature and meaning of statements referring knowledge suggests that knowledge is not accorded a priority by the BECG. This becomes apparent through the fact that knowledge features in only one of the four statements outlining the overall objectives of the school curriculum, while the statement outlining the key aims of education in the 21st century contains no references to knowledge:

(4) The school curriculum should provide all students with essential life-long learning experiences for whole-person development in the domains of ethics, intellect, physical development, social skills and aesthetics, according to their individual

potential, so that all students can become active, responsible and contributing members of society, the nation and the world (BECG, Ch.1.3, p.2)

The document explicitly instructs school leaders to *"avoid developing a curriculum that is biased towards knowledge learning"* (BECG, Ch.1.5.2, p.8). This suggests that the policy intent behind the BECG is to shift educational focus away from knowledge acquisition as the single most important curriculum outcome. Instead, the document puts a strong emphasis on developing in students capacity for and commitment to self-directed and life-long learning. Practitioners' focus should be on supporting students *"to learn how to learn"* as opposed to merely transferring knowledge, as clearly stated in quotes 5, 6, and 7:

(5) The school curriculum should help students to learn how to learn through cultivating positive values, attitudes, and a commitment to life-long learning, and through developing generic skills to acquire and construct knowledge (BECG, Ch.1.3, p.2)

(6) Life-wide learning emphasises that the school curriculum has to move from the transmission of knowledge as focused in the past, to placing greater importance in extending and enriching students' learning experiences, which should be closely linked with the curriculum and across KLAs (BECG, Ch.6.3, p.2)

(7) While teachers' guidance is important during the learning process, opportunities and space should be provided for students to explore and co-construct knowledge with peers to encourage them to actively participate in developing independent and self-directed learning skills (BECG, Ch.1.5.2, p.8)

The statements above reveal that the BECG's key educational achievement for students is not simply to learn the content, but to be able to actively engage with and co-construct knowledge: learning skills are accorded clear priority over knowledge *per se*.

Types of knowledge foregrounded in the curriculum

The overwhelming majority (~72%) of knowledge mentions appearing in the BECG are generic, that is they do not make clear distinctions between disciplinary and non-disciplinary knowledge. For example:

(8) (…) opportunities and space should be provided for students to explore and co-construct knowledge with peers to encourage them to actively participate in developing independent and self-directed learning skills (BECG, Ch.1.5.2, p.8)

(9) Through extensive reading, they [students] can connect their experiences and knowledge and achieve the following: acquiring, constructing, applying flexibly different areas of knowledge (BECG, Ch.3.3, p.2)

Despite the fact that explicit references to disciplinary knowledge appear three times more frequently in the document as those referring to the non-disciplinary type (Table 3 outlines the numbers and proportions of mentions in each category), overall there appears to be a blurring of boundaries between disciplinary and non-disciplinary knowledge in the BECG. This might be suggestive of the document's intention to elevate the status of non-disciplinary knowledge and promote it at very least alongside traditional subject knowledge.

Table 2. Disciplinary vs non-disciplinary knowledge mentions

Knowledge type	Frequency	Percentage

Disciplinary	30	21.1%
Non-disciplinary	10	7.0%
Unspecified	102	71.8%
Total	142	100%

Implied value of knowledge

Next, our analysis continues to the question about the value of knowledge implied by the BECG. References to knowledge as an end in its own right are clearly prevalent in the BECG, constituting almost 50% of the total number of knowledge mentions. Examples of statements framing knowledge as valuable in its own right, that is without specifying any further educational goals to be achieved with the help or as a result of knowledge, include quotes 10, 11, and 12:

(10) Through extensive reading, [students] can connect their experiences and knowledge and achieve the following: acquiring, constructing, applying flexibly different areas of knowledge (BECG, Ch.3.3, p.2)

(11) We recommend schools to adopt diversified teaching approaches to help students construct related knowledge, develop generic skills, and nurture positive values and attitudes (BECG, Ch.9.6, p.19)

(12) This approach to broadening and enriching students' reading experiences empowers students to: continually acquire and construct new knowledge while broadening their horizons and developing a broad spectrum of interests and abilities (BECG, Ch.3.4.2, p.6)

In contrast, the following statements (quotes 13 and 14) focus on some particular learning outcomes facilitated or enabled by knowledge, thus promoting the instrumental-value view of knowledge:

(13) This provides students with opportunities to apply knowledge of related subjects to achieve an in-depth understanding of the reading content based on the objectives of the study (BECG, Ch.3.4.2, p.8)

(14) Students need relevant prior knowledge to enhance reading effectiveness (BECG, Ch.3.6.5, p.18)

This type of framing was considerably less frequent in the BECG, constituting just over 20% of all relevant knowledge mentions found in the document. Table 4 provides the numbers and proportions of references to knowledge as a means (instrumental) versus knowledge as an end (intrinsic). It is also noteworthy that a large proportion - almost one third - of statements did not bring any particular value perspective on knowledge, making it impossible to determine whether knowledge was supposed to be seen as an intrinsic or instrumental good.

Table 3. Implied value of knowledge

Value type	Frequency	Percentage
Intrinsic	66	46.5%
Instrumental	32	22.5%
Intrinsic and instrumental	3	2.1%

Unclear	41	28.9%
Total	142	100%

Positioning of knowledge

Table 5 illustrates the numbers and proportions of statements referring to knowledge alone and as part of a wider set of curricular elements, aspects, or factors. The fact that the document contains considerably fewer exclusive knowledge mentions (54 as opposed to 88 "set" mentions) supports the conclusion about the relatively low importance accorded to knowledge in the BECG. There is a clear tendency in the document to place knowledge alongside other curricular elements considered essential for a balanced development of an individual, namely skills, values, and attitudes. Quotes 15, 16, 17, and 18 are exemplary in this regard:

(15) The school curriculum places emphasis on the balanced development of students' knowledge, skills, values and attitudes, and is centred on students' learning (BECG, Ch.1.5.1, p.7)

(16) (…) increased efforts should be made to develop students' generic skills, values and attitudes to help students achieve a balanced development (BECG, Ch.1.5.2, p.8)

(17) In addition to acquiring knowledge in class, students are expected to develop learning to learn capabilities as well as positive values and attitudes for achieving the educational aims of whole-person development and life-long learning (BECG, Preamble, p.1)

(18) In addition to pursuing knowledge and developing learning skills, cultivating positive values and attitudes among students is also very important (BECG, Ch.1.5.2, p.8)

In continuation of the above recommendations, the document instructs schools to develop assessment strategies that engage the entire spectrum of curricular elements as opposed to testing knowledge alone:

(19) Assessment should not be confined to knowledge. Students' skills, values and attitudes should also be assessed (BECG, Ch.3.5.3, p.10)

This is indicative of the BECG's intention to detract from the status of knowledge as the single most important curricular element and emphasise the important role of generic skills, values, and attitudes in promoting holistic personal development.

Table 4. Positioning of knowledge

Positioning	Frequency	Percentage
Part of a set	88	62.0%
Exclusive mention	54	38.0%
Total	142	100%

Concluding remarks

From the above analysis, the following key conclusions about the representation of knowledge in the BECG can be drawn:

Knowledge learning is not represented as the central activity of the school. Educational practitioners at the school level are explicitly instructed to avoid prioritising knowledge acquisition over other aspects of students' learning and development. Supporting students "to learn how to learn" as opposed to merely transferring knowledge is repeatedly emphasised as the central curriculum aim, and the ability to learn accompanied by a life-long commitment to learning, rather than mere possession of knowledge, is considered the most important educational outcome.

The BECG's approach to curriculum design is one whereby curriculum content is not simply drawn from traditionally defined subject disciplines but selected with a view to addressing broadly defined educational purposes, namely those of whole-person development and life-long learning.

While the intrinsic value of knowledge is recognised in the BECG, the document has a clearly discernible intention to downgrade disciplinary knowledge from the position of the most important element of the primary curriculum. Instead, it points schools in the direction of the skills taxonomy (p. 1 in the current document) with an instrumental and normative focus on helping students to become responsible and contributing members of society.

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