

TWG12 Background paper

National policies in curriculum reforms: what makes a quality curriculum in a technological era?

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Introduction

Many countries are reforming (parts of) their curricula to equip young people for life in a technological society. Although different countries have different approaches and outcomes, in general, the priorities are about learning new skills, including digital literacy and the use of new technologies. Factors which have been shown to determine national priorities have included the demands of the IT industry, new skills required in the workforce and the changing workforce balance due to the automation of many industrial processes. Within national education systems themselves there are tensions between using technology to enhance existing curriculum subjects and the need to educate next generations of workers to adapt to a rapidly changing technological world. Given these tensions, what can make a quality curriculum which also takes account of skills of teachers, changing technologies and global and national needs?

Initial thoughts on a quality curriculum

In order to garner some insight into how the participants of TWG 12 considered the question of “what can make a quality curriculum which also takes account of skills of teachers, changing technologies and global and national needs” we asked TWG12 group members to write a blog post in which they each summarised their personal view about what the ideal curriculum should look like.

TWG12 – Preparation for EduSummIT 2019 - Task 1

<p>Write a ‘blog post’ (500 to 1000 words) that outlines your views on what the ideal curriculum should look like (i.e. What do young people need to know today and in the future?). The ‘blog post’ will only be shared amongst members of the group1 . Things to think about (you may not explicitly address all of them!):</p>

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| <ol style="list-style-type: none"> 1. Does everyone need to know the same things (within your jurisdiction; globally)? 2. How inclusive/exclusive is your curriculum? 3. Should your curriculum aim for depth or breadth? 4. Who should decide what is included/excluded? 5. Is your curriculum (st)age appropriate? 6. How much choice should learners have in relation to the curriculum? 7. What is the link between curriculum and pedagogy (if any)? 8. What is the link between curriculum and assessment (if any)? 9. What are the theoretical underpinnings of your curriculum? |
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Interestingly of the 7 blog posts which were written all focused on various aspects of the questions outlined above reflecting different perspectives of the scope of the question and/or differing views about the purposes (and hence goals) of education in our rapidly changing world. To preserve anonymity at this stage we refer to the country that the author was linked with rather than their name.

England	Provides an overview of the key elements of what the curriculum should include in order that students can attain individual fulfilment and universal wellbeing, in the context of our rapidly changing world. Argues that it is inappropriate to pre-define the curriculum in detail acknowledging however, if you don't have a tightly pre-defined curriculum then the challenge is how to assess what has been learnt
Ireland	Draws attention to the key pivotal role of how our attitudes, values and beliefs influence our understandings of learning, and in particular how & what digital technologies are used ("object to think with") Highlights the necessity of articulating clearly the theoretical principles underpinning the design of a learning ecosystem (co-construction/ role of teacher-learner / agency)
Australia	(1) Rhetoric / intentions of policy in relation to skills that need to be developed are not being realised due to challenges at systems level in school & standardised testing focus (PISA / TIMMS) STEM / coding focus in schools but skills of risk taking, learning to learn and resilience not evident. (2) States that "an 'ideal' curriculum that develops pupils' competencies in UNESCO literacies to defined standards will do so through fostering a sense of agency, identity and self-concept as self-managing learners able, and committed to contributing sensitively and purposefully to sustainable development of a fragile, culturally diverse world". However, realising such a goal means successfully addressing numerous difficult design issues, including: "identifying competencies, defining standards to be achieved on each and sequence of development, designing learning environments, contexts, tasks and pupil activities, clarifying teachers' roles and equipping them to deliver them, and developing strategies for assessment, evaluation and implementation".
Netherlands	Outlines process of nationwide curriculum redesign for primary & secondary education with a focus on digital literacy.
Slovakia	Focus on "computational curiosity" and how to support learning processes to help learners use the language of programming to perceive the world, tackle problems and express ourselves. Highlights need to develop a specificity of language to describe computational concepts.
Sri Lanka	Outlines competency-based curriculum of Sri Lanka and its theoretical underpinnings. Points to the importance of understanding that there should be a link between curriculum implementation and assessment of knowledge and competencies gained by learners. Advocates the use of authentic assessment tools to measure the actual attainment and achievement levels of learners

A number of aspects/ elements emerged which the group believed were key to a “quality curriculum”

- Depth rather than breadth / engaging with complex open-ended problems over a protracted period of time [Ireland, Australia (1) (2), England, Slovakia]
- Interdisciplinary [Ireland, Australia (1), Sri Lanka, England]
- Active Learning [Ireland, Sri Lanka, England]
- Connections to the wider community [Ireland, Australia (1)(2), Sri Lanka, England]
- Adequate time for self-directed learning and resilience to develop [Ireland, Australia (1) (2), England, Slovakia]
- The digital tools & materials used influence the nature of the interaction / artefact and therefore the thinking (“object to think with”) [Ireland, Slovakia]
- Learning about computation develops a basis for thinking about the world and how it works [Ireland, Slovakia, Netherlands, England]
- Inclusive – respecting individuality (informed by learners’ needs, interests and experiences) [Ireland, Australia (1) (2), Sri Lanka, England]
- Changing Roles - Co-construction / teachers learning side by side with students [Ireland, Sri Lanka, England, Australia (2)]

A common thread among the responses was the recognition of the demands of the rapidly changing technological world with the pressing need for the development of new skills and attributes, for example as a result of the changing workforce balance due to the automation of many industrial processes.

This disconnect between what was written in many of the blog posts and the reality of the practices in schools is evident across a number of the blogs (and is more clearly borne out in the comparison of the blog post with policy documents and national curriculum – Task 2). Consequently, are there some more fundamental questions that need to be asked to put a stop to the continuous “tinkering” with the curriculum. For example, should political agendas, political interferences and intervention be prevented, and instead, rely upon experienced educationalists to develop a quality national curriculum?

Should we as educators (and policy makers?) – indeed as a society - be asking ourselves the following questions:

- what kind of future do we want to create with and for our students,
- what kind of people do we want to nurture
- and what values do we want to live by?

Our responses to these questions will be influenced by our values, beliefs and assumptions particularly in how we view Knowledge. If we consider knowledge to be situated and distributed, then learning is a social participatory process with an intimate connection between knowledge and activity while also taking account of the contexts (social, historical and physical) of a (learning) situation. Digital technologies do not have an independent existence and cannot be considered separately from the values that people bestow on them. So, there is a consistency, explicit or implicit, between how people understand knowing and the nature of knowing and what technologies are valued and how they are used. The ways in which digital technologies may or may not be used reflect these understandings.

Inherent in these questions is the symbiotic relationship between development of the individual and the shifting demands of the wider society experiencing unprecedented change. Consequently, a prerequisite to the development / discussion of a “quality curriculum in a technological era” is the articulation of a clear purpose of schooling.

The purpose(s) of schooling in our changing world

Butler et al (2018) explored this question initially drawing on key thinkers in the literature and then by analysing the purposes underpinning the educational policies in the countries represented in TWG1 at EDUsummIT 2017. The key purposes evidence from this latter analysis included:

- *Access to High Quality Education for All*
- *Citizenship (inc. Sustainability)*
- *Wellbeing and/or Success of the Individual*
- *Generic 'Knowledge' and 'Skills'*
- *Skills for Life*
- *Skills for Work*
- *Learning to Learn/Lifelong Learning*

Butler et al (2018) went on to discuss the Educational Vision and Mission Framework (Figure 1) which includes two key elements:

- A vision statement (Individual fulfilment and Universal wellbeing) which aims to capture the inter-related needs of individuals and society
- A statement of key curriculum areas

The extent to which one agrees with the key curriculum areas depends largely on your view about what the world will be like in the future (e.g. when young people leave school) and hence what knowledge, skills and attributes they need to have developed in order to achieve individual fulfilment and universal wellbeing.

Predicting the future is notoriously difficult given the rapid, and apparently increasing, rate of change. Looking back to the start of 2005:

- Kodak was still the dominant force in photography (they filed for Chapter 11 bankruptcy protection in January 2012),
- YouTube didn't exist (the first video was uploaded in April 2005),
- facebook.com didn't exist (the domain was purchased in August 2005),
- Netflix was still sending out physical videos (they didn't announce their streaming video service until 2007),
- The smartphone hadn't been invented (the iPhone didn't come out until 2007)
- Twitter didn't exist (until 2007)
- Whatsapp didn't exist (until 2009)
- Instagram didn't exist (until October 2010)
- Messenger didn't exist (until August 2011)
- Snapchat didn't exist (until September 2011)

None of us could have predicted the degree to which our lives have been changed due to these digital technologies. It would take a brave person to predict what our lives will be like in 2033 (the same distance in the future as 2005 is in the past at the time of writing).

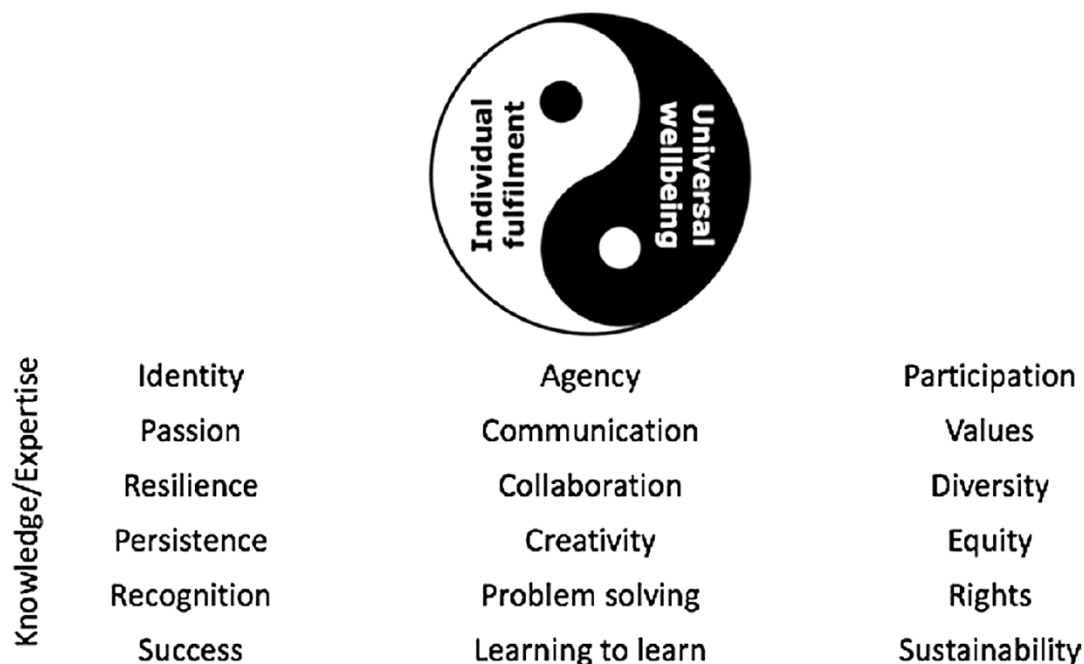
However, we do know that the world faces a number of significant challenges (OECD 2018), including:

- Technological challenges
 - Surveillance capitalism (privacy/data ownership)
 - Biotechnology and genetic engineering
 - Robotics, AI and cyborg engineering
- Automation and employment
- Demographic and environmental challenges
 - Population growth and aging demographics
 - Resource sustainability, pollution and global warming
 - Attitudes towards migration

Many of these things increase the gulf between the very rich and everyone else, and enhance the risks of civil strife and conflict (OECD 2018).

If the purpose of schooling is to develop individual fulfilment and universal wellbeing then it will need to equip young people to not only cope with, but to have control over how these things evolve. The curriculum element of the EVMF (see Figure 1) explicitly aims to address both elements of this vision.

Figure 1 The Educational Vision and Mission Framework



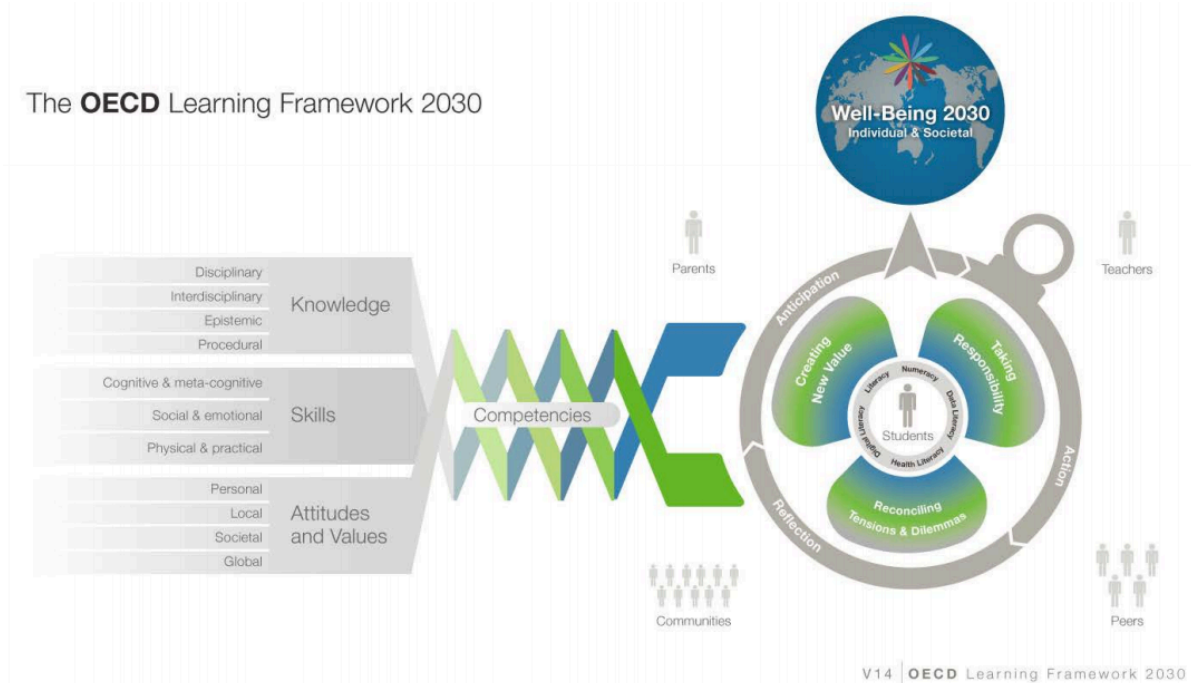
The challenge for TWG12 is to build upon this earlier work to design our version of what the optimal objectives for schooling should be. To help us in this task, we examined the objectives set out in two other frameworks (OECD and EU) and considered the extent to which existing curricula map onto these frameworks (Task 2).

The OECD Learning Framework 2030

The OECD Learning Framework 2030, which is summarised in Figure 2, also explicitly addresses the needs of individuals and of society. This framework merges different views of knowledge (including knowing about/content) with understanding different ways of making sense of the world and knowing how people act in different disciplines. This is combined with skills - knowledge of – in the form of the application of knowledge to enable students to act in appropriate/valued ways in particular contexts. Attitudes and values are seen as mediating these different forms of knowledge. The combination of these three elements (knowledge about, knowledge of, and values and attitudes) result in what the OECD refer to as competencies.

Importantly, like the EVMF, the OECD Framework recognises that the development of competencies requires changes in pedagogy, with a particular focus on increasing student agency.

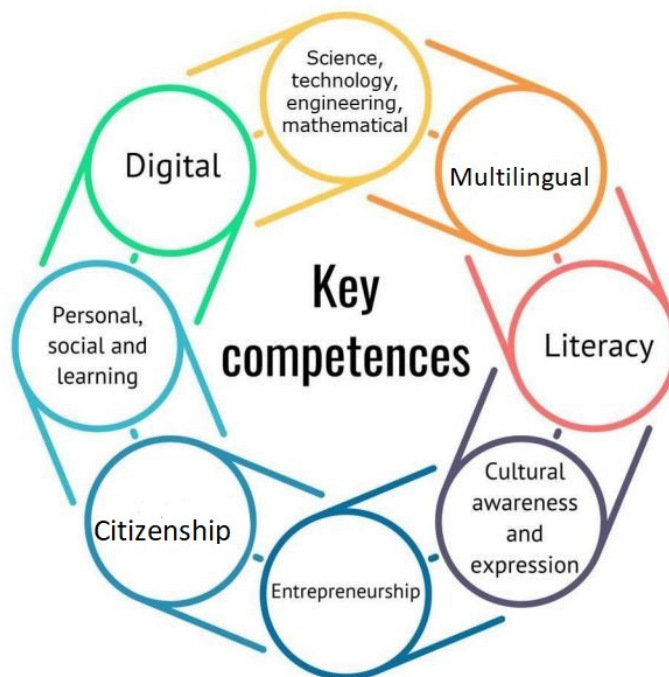
Figure 2 The OECD Learning Framework 2030



The EU’s Key Competences (2018)

The EU’s Key Competences for Lifelong Learning include eight key competences, each of which are seen as being of equal importance (see Figure 3). As with both the EVMF and the OECD framework there is a focus on both individual and societal needs, and a recognition that learning needs to go beyond content to include skills and attributes.

Figure 3 The EU’s eight key competences



Task 2 – Mapping national curricula¹

Although different countries have different approaches and outcomes, in general, the priorities are often stated as being about learning new skills, including digital literacy and the use of new technologies, and focussing on developing attributes, values and beliefs. The Netherlands provides an interesting example of curriculum redesign that illustrates these features.

An example from the Netherlands

The Netherlands is an example which illustrates a range of typical responses / approaches to tackling the problems and tensions of trying to address the shifting priorities of society particularly in relation to the use of digital technologies and how to accommodate their use in the school curriculum. However, what is unique is how the focus came round to having a national discussion on the future of education.

Since the 1980s/90s, "information science" and "informatics" was part of the national curriculum in the Netherlands, this was

- a) particularly the case in secondary education and
- b) primarily focused on understanding and being able to work with computers and programming.

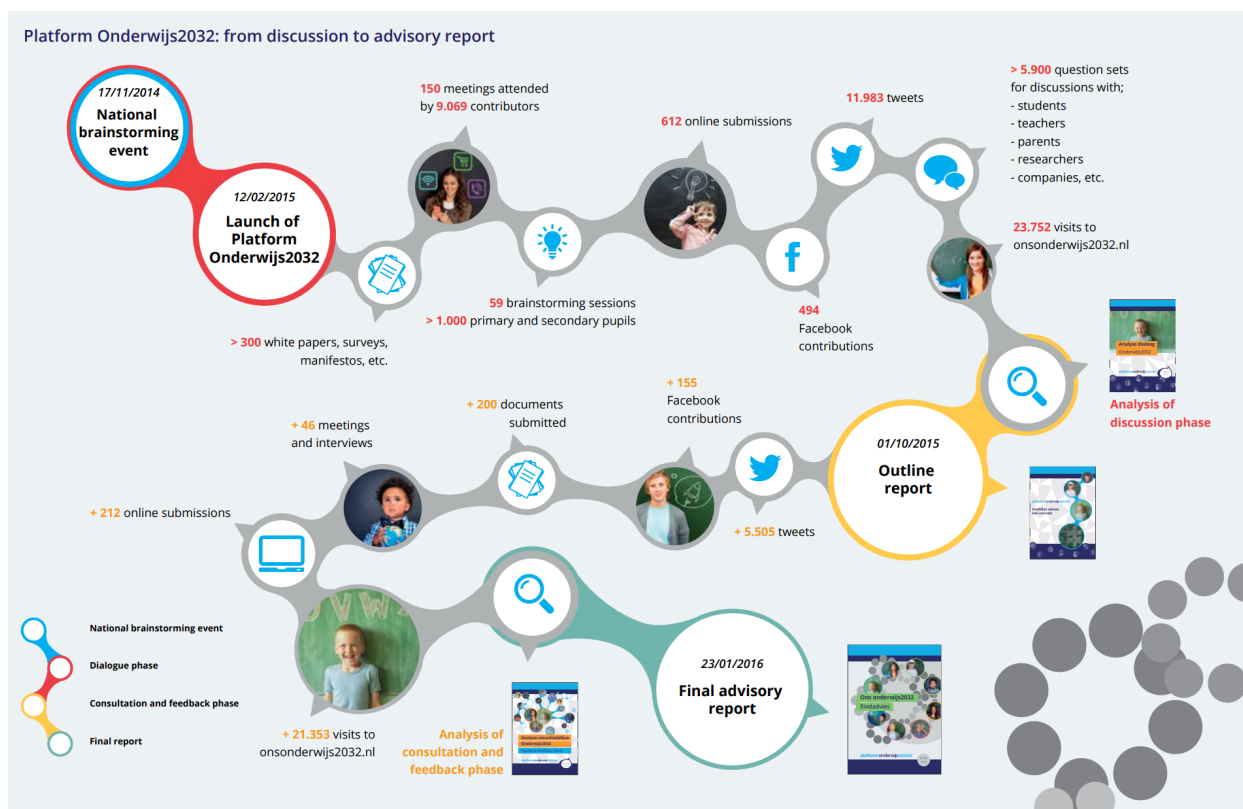
These subjects eventually proved very difficult to implement and they disappeared in 2000 from the curriculum (Voogt & ten Brummelhuis, 2014). The discussion about ICT in education gradually changed from learning about ICT to using ICT for learning and more and more attention was paid to the integration of ICT in education as a "tool" for teachers.

However a report from Royal Netherlands Academy of Arts and Sciences (KNAW, 2013), stated that the increasing digitisation of information and communication in society requires new skills but that these skills (Digital Literacy) were not getting sufficient attention in education. This report ignited the discussion again with regard to the role and use of digital technologies in schools. This focus, coupled with a range of other issues which were gaining attention (such as 21st century skills, equity, and the perceived overload of the current curriculum), led to a broad national discussion about the future of education in the Netherlands.

In November 2014, the State Secretary for Education, Culture and Science of the Netherlands officially launched an online country-wide consultation about the future of primary and secondary education. Everyone in the Netherlands had the opportunity to take part. The board consultation process is outlined in Figure 4 (e.g. social media, over 16,000 people contributed their ideas on what the young students of today should learn if they are to be productive members of society in the year 2032) was the start of a process of curriculum design which is still ongoing. Based on the consultation an independent commission, Platform Onderwijs2032, wrote an advisory report about future-oriented education in the Netherlands which they presented in January 2016 to the State Secretary. Next to the importance of specific content domains such as Language, Science, Numeracy and Social Studies they concluded that Citizenship and Digital Literacy should also be part of the formal curriculum (Platform Onderwijs2032, 2016).

¹ Peter Twining: As we have only had a few of the completed Task 2s submitted we have not analysed them in detail yet.

Figure 4 The Netherlands Curriculum Consultation Process



It took a year to discuss the report with several stakeholders and for parliament to make decisions about the way to proceed, but in 2018 the process to develop a new curriculum for primary and secondary education was started. It was decided that the new curriculum will consist of nine subjects: Dutch, Arithmetic/mathematics, English/modern foreign languages, Exercise & Sport, Art & Culture, Human & Nature, Human & Society, Citizenship, and Digital Literacy.

The new curriculum was not designed by the Ministry of Education and curriculum experts only, 125 teachers and 18 school leaders were recruited to work on the new curriculum. For each subject a teacher design team was formed to work on a subject. The teacher design teams worked together in six three-day sessions. After each three-day session the documents that had produced were open for online consultation. Everyone with an interest in the various subjects was able to react on the documents.

For Digital Literacy a teacher design team (TDT) consisting of 13 teachers, school leaders, and 2 members of the national institute for curriculum development built a vision for the subject, designed big ideas, and corresponding learning trajectories for the big ideas (Ontwikkelteam Digitale Geletterdheid, 2019). The TDT's definition of Digital Literacy is the skill that relates to using ICT effectively, efficiently and responsibly. It involves a combination of ICT (basic) skills, computational thinking, media literacy and information literacy (Thijs, Fisser and van der Hoeven, 2014).

Big ideas (also known as essential understandings) are broad statements that frame what students will learn (Government of Alberta, 2019). Eight big ideas were described by the TDT: 1) data and information, 2) safety and privacy, 3) using and controlling, 4) communication and cooperation, 5) digital citizenship, 6) digital economy, 7) applying and designing, and 8) sustainability.

In order to help teachers from primary and secondary education to teach the concepts of Digital Literacy key stages or learning trajectories need to be designed. Learning

trajectories are defined as "a reasoned structured set of intermediate objectives and content leading to a certain core objective" (Strijker, 2010). Learning trajectories not only describe what students should learn, providing clarity about the core objective, but also affords the opportunity to personalize learning by adjusting learning goals and related learning activities to the possibilities of the learners. The TDT concluded that Digital Literacy should be both a separate subject and embedded as a cross-curricular subject across all disciplines.

The TDT for Digital Literacy published their final version of the vision, big ideas and learning trajectories in June 2019. The products of all TDTs will be combined into a final report that will be discussed in parliament in November 2019, and a final decision is expected in December 2019. This decision will lead to the next stage of curriculum development: making the learning trajectories and goals part of the legal and mandatory framework for primary and secondary education in the Netherlands. It is expected that the new curriculum will be implemented in the year 2022.

Key things we can say about curriculum

As evident in the Netherlands example above, and in many of the Task 2 responses (so far), there are tensions within individual national education systems between using technology to enhance existing curriculum subjects and the need to educate next generations of citizens to adapt to a rapidly changing technological world. This tension is evident in the rhetoric of many of the policy documents which stands in contrast to the actual practice in classrooms which is the reality for the students.

"the intentions in policy are sound and on paper we are strong ... implementation of such ideas is relatively stifled at the systems level in schools through a range of challenges, ... inability to be agile, flexible and future focused ... [focus instead on] high profile standardized testing within our nation to improve quality on PISA and TIMMS"

(Australia (1), Task 2)

This highlights the need to address the "elephant in the room", which is assessment. The need for alignment between Curriculum, Pedagogy and Assessment that has been flagged up here is precisely the focus in Butler et al (2018). The key message being that it is counter-productive to attempt to define "a quality curriculum" without also addressing pedagogy and assessment.

However, despite these constraints (not being able to specify the optimal curriculum without reference to pedagogy and assessment) there are some things that we can say about the specification of such a curriculum.

If one examines curriculum specifications at the level of key elements, which indicate overall learning objectives, there is remarkable consistence across different jurisdictions and frameworks. The challenge comes when those broad objectives are translated into learning outcomes which are presented as measurable indicators of learning. Our standard approaches to summative assessment are unable to capture the aspects of new curricula focussed on skills and attributes. Not unreasonably, teachers tend to focus on those things that they are held accountable against, predominantly high stakes test results. In practice this means that they continue to focus on content (knowledge about) to the exclusion of skills and attributes.

Unless we find solutions to this assessment problem the gap between the rhetoric of national curricula and other policy documents and the reality of practice in schools will remain.

Some big questions to consider/address:

- Can we agree on the purpose of schooling?

Assuming that we can, then:

- Can we agree on the high-level objectives/curriculum areas that a quality curriculum should include? (e.g. What are the Big concepts / Big Ideas – e.g. systems thinking – that ought to be included. What are the things that EVERYONE needs to learn?)
- What are our views on the role of digital technology – is it the opium of the people (being controlled rather than being in control) or a silver bullet for education?
- What implications for the quality curriculum do the following issues have?
 - The sustainability of digital technology – carbon footprint?
 - What happens if all the computers go down – do we have the competence to carry on?
 - How does digital technology impact on the mental wellbeing of young people (everyone)
 - Is addiction to digital technology a major concern – reach for it first thing in the morning and last thing at night/excessive 'screen time'?
 - What are our views on surveillance capitalism, civil liberty and ethics (George Orwell 1984; othering (the Chinese are doing it – but so are we e.g. person fined for hiding face from security camera in the UK))?
- How would we respond to the claim that the curriculum doesn't matter – what matters is what is on the exam syllabus? If that is the case what are our suggestions for how to overcome this issue (for example, do we have suggestions for better forms of summative assessment?)
- Many of the challenges highlighted earlier in this paper point towards a growing gulf between the very rich (who control digital technology) and everyone else – ultimately this might lead to a dystopian Mad Max scenario of divided societies – what implications does that have for a quality curriculum?

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² Deirdre Butler: I tried getting as many refs as possible – Petra can help with the remainder as many of them seem to be in this chapter she has written
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