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**DIRECTORATE FOR EDUCATION AND SKILLS
EDUCATION POLICY COMMITTEE****Education 2030 - Conceptual learning framework: Background papers****The Future of Education and Skills: Education 2030****6th Informal Working Group (IWG) meeting
23-25 October 2017
Paris, France***Participants are invited to:*

- *NOTE the draft experts papers and opinion papers as the background information for discussions on the OECD Education 2030 Learning Framework during the 6th IWG meeting*
- *PROVIDE comment, if any, to the secretariat in written form by 30 November 2017*

The papers were drafted by John DUNN (Fellow of King's College & Emeritus Professor of Political Theory, Cambridge University), Katariina SALMELA-ARO (University of Helsinki), Vishal TALREJA (Co-Founder/CEO of Dream a Dream), Tadahiko ABIKO (Kanagawa University), Namji STEINEMANN (East-West Center), Charles LEADBEATER, Tom BENTLEY (RMIT), Anthony GRAYLING (Philosopher), Daniel KUNIN (M.S. Stanford University), Nancy WALT (Executive Director, Ministry of Education), Arnold TOUTANT (A. Toutant Consulting, Ministry of Education) and Rod ALLEN (Superintendent, School District #79 Cowichan Valley), Helen HASTE (Harvard Graduate School of Education/University of Bath), and Peter BISHOP (Teach the future Inc.).

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Background

At the 5th IWG meeting, it was agreed to deepen and further the theoretical underpinnings on some of the key concepts, drawing on the discussions and questions raised during the meeting with regard to OECD Education 2030 Learning Framework. Thematic working groups were organised in line with the selected key concepts. For more detail, see [EDU/EDPC (2017)25/ANN1] , in 11 working groups.

The following draft papers and opinion papers have been prepared by experts to strengthen the theoretical underpinnings as well as global perspectives of the OECD Learning Compass 2030 for some of the thematic working groups:

Working group: Future we want

- A revised draft concept paper on Democracy and Education for the future by John DUNN (Fellow of King's College & Emeritus Professor of Political Theory, Cambridge University)

Working group: Student agency

- A revised draft concept paper on co-agency by Katariina SALMELAARO (University of Helsinki)
- A revised draft concept paper on the impact of adversity on student agency by Vishal TALREJA (Co-Founder and CEO of Dream a Dream)
- Short comments on 'Student Agency' - a Japanese view by Tadahiko ABIKO (Kanagawa University)
- A draft concept paper on Student Agency in Asia: Educators' Perceptions on Its Promises and Barriers by Namji STEINEMANN (East-West Centre)
- A draft concept paper on student agency (updated) by Charles LEADBEATER.

Working group: Teacher agency

- No paper commissioned

Working group: Transformative competencies for 2030

- Brief comments on 'Creating new value' and 'Taking responsibility' by Tom BENTLEY (RMIT)
- Observations on 'Taking Responsibility' and 'Coping with tensions and dilemmas' by Anthony GRAYLING (Philosopher)

Working group: Foundational skills/ literacy for 2030

- A revised draft paper on "Data Literacy: Extending Literacy in the Age of Big Data" by Daniel KUNIN (M.S. Stanford University)

Working group: Knowledge for 2030

- A draft concept paper on "BC's Redesigned Curriculum - Theoretical Underpinnings" by Nancy WALT (Executive Director, Ministry of Education), Arnold TOUTANT (A. Toutant Consulting, Ministry of

Education) and Rod ALLEN (Superintendent, School District #79 (Cowichan Valley))

Working group: Skills for 2030

- No paper commissioned

Working group: Attitudes and values for 2030

- A draft literature review on "Defining Values and Attitudes in the Context of Learning and Well-Being" by Helen HASTE (Harvard Graduate School of Education/University of Bath)

Working group: Anticipation-Action-Reflection development cycle

- A draft concept paper on "Anticipation and Agency" by Peter BISHOP (Teach the future Inc.)

Democracy and Education for the Future

John Dunn (Fellow of King's College & Emeritus Professor of Political Theory, Cambridge University)

1. What democracy was and is

Democracy entered world history in ancient Greece two and a half millennia ago as the name for a way of organizing human life together on a relatively small scale. In the city state of Athens it proved for quite a long time highly successful, leading the defence of Greece against the far larger, wealthier and more powerful empire of Persia. Within two centuries it had been conquered from the outside and democracy as a self-conscious and compelling political idea disappeared from world history for two thousand years. It left behind it the memory of an extraordinary culture and the principal ideas through which Europeans and their descendants in other lands have thought deeply about how to live together ever since. Late in the eighteenth century it came back to life in Europe and North America as the political goal of a quite different and far larger form of community, the modern territorial state, drawing its claim to rule, not from God or military conquest, but from the regular free choice of its own citizens. Since that time the territorial state has come to be the political framework of every substantial living human population, most states have expanded their citizenship to take in the great majority of their native born inhabitants, and a substantial majority have adopted, however intermittently, a version of authorization by at least the appearance of popular choice.

There is one sharp contrast between ancient Athens and any modern state, democratic or otherwise. In Athens the citizens took every major decision for their community by meeting and discussing it together. They made the laws, declared war or made peace, picked the generals to lead the fight for them, and then went on to fight their wars in person. Unlike today, the citizens were not a large proportion of the population and all of them were adult men; but, also unlike the citizens of any modern state, they held the life of their community in their own hands, accepted their personal responsibility for how it went, and recognized their duty of loyalty towards it. Ancient citizenship was very active and highly committing. Modern citizenship thus far has usually not been. The citizenship we will need in the decades to come, and as far as we can see into the future, will be far more active than the citizenship of any country today. It will place greater demands on citizens, have to promise them altogether more in return, and enable them somehow to learn together how to deliver on that promise. The education of tomorrow will still need to give every pupil many capacities it has long striven to provide them but will also need to provide something else far more difficult but every bit as essential. It must equip each of them to recognize and meet these new demands, and handle their relations with each

other, and with the fellow human beings who happen to govern them, with a wiser balance of respect and insistence. This will have to be true in every effective society in the world that lies ahead of us, irrespective of the way in which those who do the governing happen to be selected.

To respect these necessarily distant figures they must in some measure share their judgment of what matters and trust them to do their best to deliver it. But to insist effectively they must also have the means to judge firmly for themselves how far their governments are right in their assessments and the confidence (and means) to press back hard where they see these as mistaken or distrust the latter's good faith in what they are attempting to deliver. Living together on any scale requires stamina as well as skill, so every community must do its best to endow its children with a repertoire of skills and a level of stamina which equip them fully for the lives they will have to live and enable them to grasp the opportunities and confront the dangers which await them. The aspiration of democracy, as early as Athens, has been to go on teaching them how to enhance those skills and strengthen that stamina across their lifetimes by the ways it conducts its political life. This is an intimidatingly lofty standard for either education or politics; but it is an instructive and wholly coherent goal for each to aim at.

For the most part the deeper and more ambitious thinkers of ancient Greece did not view democracy as a wise way to organize life together over time. But most Athenian citizens for quite a long time differed sharply from them on this verdict, and for much of that time there is a good case for judging that it was the citizens of Athens who more proved right in practice. It was not political failure which destroyed democracy in Greece. It was foreign military force¹.

2. Why is the challenge to democracy today so acute?

States today differ sharply in their understandings of what democracy is and requires, and differ too accordingly in their explicit conceptions of the types of skills and stamina their children will in the long run need to have acquired. Some still view each very narrowly and set their sights quite low, not least because the resources they can hope to control are stretched to provide even these. Democracy is no remedy for lack of resources; but it is increasingly clear that education, especially for women, is a huge resource in itself.

The representative democracy of Europe and North America and its counterparts in societies which have chosen to emulate it in other parts of the world has not worked well politically in most cases since at least 2008. It is increasingly felt by its own citizens to be failing them and still more to be failing their children. It has disinvested damagingly in education under severe fiscal pressure and depleted the trust of its citizens in the accuracy of its judgments of their present and future needs and its commitment to provide them with the means to meet these.

¹ John Dunn, *Setting the People Free*, London: Atlantic 2005; *Breaking Democracy's Spell*, New Haven: Yale University Press, 2014

Conspicuous current failure is an unconvincing (and unlikely) augury of future success, so there is good reason for this level of civic dismay. This is a fierce challenge to the claims of democracy in any understanding, and not one which could be fully met by any possible change in curriculum or educational vision. But it is a challenge to education as much as to democracy and in many ways the clearest way to see the real nature of that challenge. The dynamics of representative democracy today heavily privilege the very short term over the long and impede societies as much as individuals from recognizing the practical priorities which confront them. Unsurprisingly, they also deter them all too effectively from bracing themselves to meet them².

In political terms this has been a failure of the citizens of democratic states to direct their representatives to focus on and secure the prerequisites for sustainable well-being, either individually or collectively (OECD Learning Framework 2030, 3-9). In economic and social terms it has been a failure to generate or sustain innovation, resilience and sustainability within communities (OECD Framework, 9-10). In educational terms it has been a failure to varying degrees to equip an increasing proportion of pupils with the individual competences they will need to survive and flourish on a global labour market in skills, energy and initiative or play the part in forming citizens equipped to direct their representatives to secure their interests or collectively over time. It is in essence a single failure; but it cannot, of course, be remedied just by educators on their own, any more than it can by either political or economic leaders. Nor can it be remedied rapidly. Education, formal and informal, public and private, is primarily how societies attempt to reproduce themselves for the better in time. Teachers must view their responsibilities as stretching across the lifetimes of their pupils and this requires them to take a far longer view than competitive electoral politics either encourages or rewards.

The most salient challenges to democracy today are plausibly by now challenges to every contemporary state and the great majority of its inhabitants. It is quite wrong to think of them as defects in the institutional form of a particular kind of regime. Their most prominent expression has been the long running crisis in the world economy which began in the United States in 2008 and has spread out across the world ever since, inexorably draining their markets of effective demand, and piling up in most of them ever rising levels of personal, corporate and public debt. For some time this largely spared the emerging markets and it has still really to weigh down on India. But it remains entirely unclear that any national economy can hope to escape it merely through raising the dynamism of its own internal market. This global movement sours the politics of every country it reaches, highlighting many of its pre-existing divisions and exposing its sheer fragility as a society. It weakens governments by enfeebling their capacity to tax, and impairs their capacity to sustain order and maintain the welfare of their own citizens, let alone enhance this in novel and sustainable ways³. The legitimacy of governments wilts accordingly and popular animosity towards their current incumbents increases sharply.

Since at least the eighteenth century, in Europe, it has been most illuminating to see this as a challenge to a particular kind of society founded on a division of labour directed ultimately towards a market⁴. Commercial societies, as eighteenth century philosophers and economists conceived them, have shown by now across the world and for a

² John Dunn, *The Cunning of Unreason: making sense of politics*, London: HarperCollins, 2000; John Dunn, *Breaking Democracy's Spell*

³ John Dunn, *Legitimacy and Democracy in the World Today*, Justice Tankebe & Alison Liebling, eds *Legitimacy and Criminal Justice: an International Exploration*, Oxford 2014, 7-18

⁴ Istvan Hont, *Politics in Commercial Society*, Cambridge, Mass.: Harvard University Press, 2016

considerable time that they can raise the prosperity of their populations across their class structures and regional variations, if always in highly uneven ways. For nearly four decades China too has tacitly adopted this model, without in any way altering its political arrangements for the purpose, and drastically reshaped the world economy and geopolitics by its success. The result has enormously increased the volume and value of global trade and mainly, until very recently, lowered the barriers to it. By this point, however, the cumulative impact of the global crisis has prompted a sharp reaction, and the impulse to raise tariffs and close markets to foreign goods has strengthened greatly in one country after another. The most conspicuous political consequences thus far have been the outcome of Britain's Brexit referendum with its chaotic impact on the country's domestic politics and governmental capabilities, and the election of President Trump with its as yet imponderable implications for the world at large. Protracted economic crisis does not alter the basic choice which faces any commercial society between trading freely with all comers and what the German philosopher Fichte called the Closed Commercial State⁵. There are political attractions to the latter for fast weakening incumbent governments, since its immediate effects give clear benefits to citizens who were previously aggrieved, while the longer term damage, which it is certain to inflict, will be distributed across almost the entire population and is seldom immediately apparent for anyone. The sheer recklessness of the Brexit choice, for example, has yet to get through to most of Britain's electorate.

In the long run representative democracy has proved to be Europe's most effective format for handling the political requirements of a commercial society, though its passage towards that verdict was more than a little erratic up to 1945. Beyond the European diaspora its record thus far has been much shorter; but until the crisis of 2008 it too appeared relatively promising. What makes representative democracy a plausible format for a society founded on the division of labour directed towards a market is its practical expression of the capacity potentially to benefit all its members and give each a corresponding reason for loyalty to it and commitment towards it. What restricts that plausibility is the drastic inequality with which it allocates those benefits, the lack of any imaginatively or rationally compelling criterion by which to do so, and the apparent whimsicality or blatant injustice with which it frequently does. The plausibility is necessarily at its feeblest in face of protracted economic crisis, since this underlines the limits in its capacity to benefit far too many and naturally diminishes both their loyalty and their commitment. The consequences of this may be grave for any of its inhabitants, so in the longer run almost all have a large stake in restoring its capacity to furnish benefits more uniformly and generously. Unfortunately, it is never clear how best to do so; and neither the appearance nor the substance of professionalized political competition give much reliable help in clarifying how to, let alone in implementing the result.

In these circumstances education must always necessarily come too late; but the imperative to face such ordeals together shows just how profoundly our societies now need their members to be equipped to understand why this is so. The institutional forms of representative democracy could never in themselves be a sufficient substitute for this distributed understanding. Only an education fit for the world we already live in can hope to prove so. It is far too late in the history of our species to confine political awareness or comprehension to a political elite. The price of the benefits a market economy can make

⁵ Isaac Nakhimovsky, *The Closed Commercial State: Perpetual Peace and Commercial Society from Rousseau to Fichte*, Cambridge: Cambridge University Press, 2011

available is the duties of the citizens who would receive them. Just as peremptorily, the precondition for these duties to obtain in reality is the real provision of those benefits to every one of these citizens. No one can be the citizen of an economy, so the key vector for this provision still very much remains their own state. States need not and almost certainly should not monopolize the provision of education; but they are strictly liable and unremittingly responsible for the consequences of the education their citizens do receive. Where those consequences leave an ever larger proportion of their citizens unable to find an active and rewarding place in the labour market and alienated from the political life of their society, it is very clear that they are failing to provide all too many of their citizens with sustainable individual well-being (OECD Framework, 9-13) .

3. How to educate for the societies we already are and the societies we must learn to become

3.1. The repertoire of skills we now need and the challenges they must equip us to meet

In the European epoch in which the paradigmatic task of education was to turn peasants into Frenchmen⁶ the content which it required had shifted already from passing on ancestral skills for a community well aware of requiring them to imparting generic competences by and for a much wider community with far less evident requirements.. These skills began from arithmetic, along with reading and writing in a consciously national vernacular; but they now demanded also a due recognition of the claims of the state on those it enabled to acquire them.

Commercial society was not initially a conscious creation. As its key characteristics came to be recognized in one country after another, it remained far from clear what was either necessary or sufficient to sustain it politically and enable it to prosper economically or flourish socially. What appeared quite effective for a time in one respect often proved very harmful in either or both of the others. As yet it is far from obvious that we have made much purely intellectual progress in seeing how best to combine success in all three. But we have never had the time to wait for fuller intellectual solutions. Within our means and very partial comprehension we have attempted to give each fresh generation our best guess at the skill set we expect its members to require. Many of the skills and capacities they find they do need they have still had to learn or fail to learn, as they always have, in the inexorably insistent world of work. But the intricate division of labour of every fully commercial society ensures that it must be their nurseries, school and universities that intersect to work out together how to answer this question in practice. It is the competencies these institutions contrive to develop in their pupils that form the latter's key resources for facing their collective as much as their individual futures.

⁶ Eugen Weber, *Peasants into Frenchmen: Modernization of Rural France 1870-1914*, Stanford: Stanford University Press, 1977. Cf Bernard Bailyn, *Education in the Forming of American Society*,: Needs and Opportunities for Study, Chapel Hill: University of North Carolina Press, 1960

As a professional activity education tends to specialise heavily in one or other of these three institutions; but is best to view them not as sites of discrete activity but as parts of a single continuous arc of learning (or failing to learn). When we view it in this way, it seems clear on present evidence that the most decisive interventions, individual or collective, come very early in life. This is likely to prove even more important for the future than it has done in the past.

In its current form each of these institutions is largely a product of the industrial age, the period in which increasingly elaborate and costly machinery, applying energy largely stored in the earth well before there were any human beings, has transformed the landscape of much of the world, pulling its human inhabitants increasingly into ever vaster cities, and enormously increasing the human impact on the globe. Over time this process has largely replaced human strength with machinery. More recently it is increasingly replacing human intelligence too at least at its less strenuous levels. In the earlier stages of this process the labour forces of giant factories might consist mainly of unskilled workers performing relatively simple and repetitive tasks often under very high pressure. Today already their labour forces are far smaller, much of the work is carried out by sophisticated high precision machinery, and the labour still deployed often demands far higher levels of skill and intellectual responsiveness. One consequence has been a precipitous fall in lifetime employment and an urgent need for more active pursuit of the employment there still is. An education fit for the age of Henry Ford, or even Giovanni Agnelli or Ratan Tata, is not one fit for the age of Bill Gates or Steve Jobs. It is even less likely to prove fit for the ages that lie ahead. These will certainly require much higher levels of resilience and initiative throughout their adult populations, and need to structure the education they provide to generate these as fully as they can. This will necessarily demand very high investment in the development of intelligence at all ages and all levels in ways which it is inconceivable that markets alone will supply. As *The Future We Want* (OECD Framework, 9-20) underlines, the educational institutions of our societies now urgently need to enable their students to become effective agents capable of life long self-directed learning, and equipped to communicate and interact with well justified assurance across the wide diversity of their fellow citizens and increasingly with those of other countries. Along with the political and economic leaders of their society, these institutions also need to explain effectively to every adult citizen just why they should need these costly facilities and what makes them a real collective good, and not just a direct personal benefit, economically and socially, to those who immediately receive what they provide. To thrive today any society needs a far higher degree of collective self-awareness over a much wider space. Educational institutions plainly cannot provide this on their own; but the intimacy and protraction of their relation to their pupils ensures that they are bound to remain the privileged site for any society's attempt to create and deepen it.

Our societies will need, too, to view the main aim of this education in a different way: more as the shaping of persons and their capacity for agency than as funding a quotient of units of pre-specified labour or a finite supply of pre-determined skills (OECD Framework, 9-16). The central skill they must generate as widely and amply as they can is the capacity to go on learning boldly across a lifetime. Boldness is rather obviously a property of persons, not of units of labour. It is also often highly disruptive in educational contexts, so schools in the past have often strained to confine it as narrowly as they can, and even now face some temptation to go on doing so (OECD Framework, 15-20). Historically considered, school discipline has been largely a training in docility, if not in

real or skilfully simulated timidity. Every school or university must do its best to train audacity for the better and those of the present and future need to do so at least as much in the class room as on the sports field.

The role of teacher has always been demanding in any culture but it is bound to become far more exigent everywhere than in the past. It will require fresh skills and even greater patience and composure. Within the relentless incentive structures of any commercial society this can only mean that the economic rewards of teaching well must rise abruptly and the dignity and esteem of careers open to educational prowess rise along with them. This is not what has been happening in our societies over the last three decades and it will require a sharp change in economic priorities.

No society is just an economy, so none could sanely wish to shape its members solely for the world of work. Shaping persons begins in the home, and every home must do its utmost to shape its children for the lives they will go on to lead. But the view from any home of what those lives will require is inevitably restricted, and all but certain to be insensitive to their prospective impact on others at increasing distance. The world that commercial societies have built is one in which huge numbers of lives already bear in different ways on the lives of innumerable others, sometimes very far away. To shape a person for life in a village can be quite a clear aim, seen against the horizons of the family of their birth. To shape a person to live their life in a dense web of highly consequential interactions which stretches right across the world needs a horizon which reaches as far as the web extends, and a very different imaginative scope. This is not a matter merely of spatial awareness. It requires, along with that awareness, a vastly wider extension of recognition of, and respect for, sheer human diversity. The education it informs may certainly still be patriotic, but it cannot safely to any degree be chauvinist.

Teaching anyone to widen their recognition of human diversity and deepen their respect for it is an educational task which fits poorly with concentration on maximizing examination performance. In many subjects, till quite a late stage in school and even sometimes in universities, examinations still predominantly test knowledge of information or accepted conclusions. They make little effort to test a pupil's grasp of how to think. Most information which is publicly available at all, and increasingly much which is not meant to be, can now with a modicum of skill and effort be tracked down by internet search by anyone equipped to understand it (OECD Framework, 15-20).

Shaping persons for a world wide web of interactions cannot safely be confined to enhancing their ability to work for economic reward. It needs at least as much to nurture their emotional intelligence, extend their range of human sympathy, and strengthen their proficiency in social cooperation. This is still a more prominent goal in nurseries and primary schools than it becomes once the shadow of competitive examinations falls more darkly on the class room, lecture theatre, or even laboratory. In this respect at least it is the schools and universities which more need to adjust their aims. At present in the societies to which we belong it is the schools, and especially the primary schools, which are the key frontiers of social cooperation over time. They cannot be, and must not become, gated communities for those without the nerve to live beyond their own immediate milieu.

All three of these institutions, to adjust their aims effectively must first identify, and focus their efforts on, the principal challenges their pupils will need to meet: the challenge posed by technology and its impact on the needs and opportunities for work, the challenge posed by globalisation, the challenge posed by informational flow and the control potential of big data, the challenge posed by terrorism, and the fearsome challenge

already pressed by the direly threatened ecological setting in which human beings can exist at all. All five are very much challenges to education and each carries real and profound menace. Only the last two hold far more threat than they do promise.

3.2. The challenge of technology and work

It is technology which poses the oldest of these challenges. The deployment of new machinery displaces far more labour than it contrives to employ and it is always an open question for society as much as for an individual where to re-deploy that labour effectively. The Luddite response to the fate of the handloom weavers was predestined to fail⁷; but we have no greater assurance two centuries later that we know how to answer that question humanely or well. Neither the mines of South Wales, Yorkshire or West Virginia, nor the smoke stack industries of America's Mid-West or Britain's northern coasts, do much to indicate that we have learnt cleverer or more sensitive ways to adjust living together to drastic changes in our techniques of production. This is especially important because our residual confidence in facing the future still depends heavily on the efficacy of an early nineteenth century alliance, epitomized by Robert Owen, James Watt or Henri de Saint-Simon, of scientist, engineer and entrepreneur. This very much remains the optic of Silicon Valley. It is never possible to tell in advance how effective that alliance will prove in enhancing productivity, limiting the biological and physical damage inflicted by the technology it deploys, and sustaining whilst struggling to do so its legitimacy amongst the communities whose lives it transforms. There is little reason for greater optimism that it will prove more successful where it is applied through the apparatus of the state.

The record of productivity in advanced economies since at least 2008 has been extremely disappointing.⁸ Its record has made it quite evident already that the principal educational need for every child or adolescent from now on must be to equip them by the time they leave school to face a world well beyond the settings in which they grew up with the resilience, adaptability and nerve to find new settings and occupations, however far away, which will offer better prospects to their own children when their turn comes to need them.

Education for resilience, adaptability and nerve is irremediably individual in incidence. It is no substitute for corporate strategy, scientific research or well-chosen governmental economic policy; but it is going to be every bit as consequential in the decades ahead not just for every individual in person but for the fate of the entire societies to which they belong.

We will need technology in the future if we are to save ourselves from the consequences of our past actions, and need it more than we ever have in the past. We will need especially to ensure that it does not turn on us and destroy us; but that is a highly specialised task for those who best understand that technology, while the task of learning to live as confidently and agilely as they can with its unnerving momentum has become

⁷ E.P. Thompson, *The Making of the English Working Class*, London: Gollancz, 1963

⁸ See especially Martin Wolf, *The Long and Painful Journey to World Disorder*, *Financial Times*, 5 January 2017; Martin Wolf, *Seven Charts that Show How the Developed World is Losing its Edge*, *Financial Times*, 19 July 2107; The key background work is Robert Gordon, *The Rise and Fall of American Growth*, Princeton: Princeton University Press, 2016. The UK record of productivity growth has been especially dismaying for at least a decade (Sarah O'Connor, *Employers Sound Upbeat Note on Hiring as Jobs Engine Keeps Whirring*, *Financial Times*, 12/9/17, p 3).

universal: a task for every child from now on. The intelligence of machines, as much as their sheer power, is an immense collective resource for the future, but it will pose a bracing challenge to every future generation, and there is every reason to expect that challenge to intensify for some time to come. We have no Luddite option in face of robotics or artificial intelligence; but they make it very clear that we cannot look just to technology for our salvation (OECD Framework, 9-20).

3.3. The challenge of globalisation

The challenge of globalisation is quite old and has always fluctuated in intensity. It has long come from the scale and organization of international trade; but it comes as much by this point from the movement around the globe of human beings in very large numbers, and from the hectic passage across it of tsunamis of information, economic, cultural and political. The latter by it ensures that there is no space left for Karl Marx's vision of rural idiosyncrasy. You can still bury your head in the sand, should you wish to, in a remote village; but we can now see that you do not need to live inaccessibly to contrive to. The temptation to do so can be every bit as strong at the heart of government and superior knowledge is a flimsy barrier to succumbing to it.

There have long been powerful grounds for seeing a world market in goods and services as a huge potential good for the vast majority of living human beings; but no one could sanely see it as a community or even a collective enterprise. The terms on which goods and services trade, will always seem highly provocative to all too many. This puts a fierce strain on the domestic politics of any country as much as on its international relations; and the task of balancing trading opportunities against the intrusions of foreign competitors cannot any longer be left to economists or professional politicians to shoulder. Every society nowadays needs an amateur political economy for all its citizens alongside the professional political economies of its economists or business leaders, and the official political economy of the officials and career politicians who currently control its state⁹. In electoral democracies especially citizens will not in the end trust conclusions which are deeply unwelcome unless they at least feel they understand the grounds which make them necessary. This shift in the division of political labour is a major educational challenge in itself. It is sharpened further by the scale of human movement over long distances for refuge or economic opportunity. This is not a process we can hope to stop, even if we learn to channel it less brutally and more intelligently. By now only societies confident with good reason in themselves, and equipped to judge the intensity of need for those who try to come and the balance of advantage in welcoming their arrival or struggling to obstruct it, can hope to flourish over time. That confidence too, from now on, must be based on understanding, not on an unthinking deference to the judgment of superiors, which is probably no longer available.

The communities of the past have been held together in large measure by a strong sense of place. Orientation and belonging were heavily local, and loyalty, along with dispositions and capacities to cooperate, depended heavily on familiarity. For a fast rising proportion of the world's population the lives of the future will need far wider horizons, much greater adaptability, and a willingness to shift energies and loyalties a very long way away from the place of birth, whether inside or outside the same country. This process is as old as human history, even if its scale is now so much vaster; but it is not

⁹ John Dunn, *Interpreting Political Responsibility*, Cambridge; Polity Press, 1990, 193-215; Dunn, *The Cunning of Unreason*

only the scale which is novel. Just as new is the widening opportunity to understand why it is occurring and recognize how it can be beneficial.

It means that every child must now be taught how to look well beyond their own initial community and recognize its setting within a worldwide network of communities. Living together has always required tolerance and the capacity to control and moderate animosities. Most communities beyond the family have achieved this in part by redirecting intolerance and animosity as much as they can at groups and places comfortably further away. This has never been a prudent strategy; but by now it has become prohibitively dangerous. The impulse to cling on to familiarity and lash out at the unfamiliar is deep. In many ways it is strongly reinforced by the technical basis of much contemporary sociality. The echo chambers of the web can be every bit as confining and chauvinist as the narrowest village. Above all else education is a project of formation. One of its prime tasks must now be to fight that impulse tenaciously and intelligently from the nursery upwards. Like technological change, this is as much a political as it is a social and economic challenge. Its main weight in the case of technology is bound to fall on the judgment of the governments which must choose how to act on their citizens' behalf, but with globalization it falls just as directly and heavily on the citizens themselves and it must be mainly their education which equips them to bear it. The intimate and very local communities of the past set firm limits to personal autonomy and might find it relatively easy to define loyalty and specify responsibilities. The world of the future will demand far greater autonomy from all its human denizens; but it will find it much harder to show them how to balance the autonomy they must achieve with their responsibilities towards each other and deter them from enjoying it at other people's expense (OECD Framework, 15-20).

3.4. The challenge of information flow

Nothing in the past has changed the ways in which so many human beings spend so much of their time so fast as the invention of the worldwide web. Initially an offshoot of military technology, it has already transformed the nature of commercial competition in a wide variety of fields and created quite new ways of organizing and disorganizing collective life on a gigantic scale. Just as strikingly, it has altered the ways in which many hundreds of millions of human beings relate to each other, especially during the most crucial phase in their shaping, their childhood and early youth. Like technology and globalization it has generated an immense range of novel ways for us to achieve what we want and generated possibilities to manipulate and damage deliberately which are already unnerving but still largely imponderable. For individuals it appears initially very much as an exhilarating enhancement of their powers to know; but it is always just as much an opportunity to be known about; and the space it has created is one in which no one can hope to do much to manage the impressions they give in everyday life. All the web is a stage on which no one can ever know just how wide or unwelcome their audience will prove to be. The initial impact of a medium like Facebook was dramatically disinhibiting for children as well as terrorists; but in both cases it has prompted strong reactions since. Big data already make it possible to survey much which lay beyond the reach of human knowledge, and to understand physical and biological processes in unprecedented depth. They also make it possible to track social, political and economic processes on a quite new scale and potentially to understand some aspects of them far more precisely than ever before. For giant corporations and well organized governments it already compresses individual privacy quite tightly and could at a limit virtually eliminate it for anyone they

chose to pick. Here too the main educational need for the future will be not just to impart the competencies required to utilise the web personally to best advantage. It will also be to give every child sufficient comprehension of what the web is for them to see why communities as much as individuals need to view the possibilities it has opened up with great care and caution. Whatever else it is, the web is a field of power; and power flows across it at disturbing speed and often in wholly unpredictable ways. One of the prime lessons which every human community must constantly relearn is how best to handle together the flow of power within it and across its boundaries in each direction. For communities as much as individuals from now on the web is bound to constitute political exposure just as much as it does resource (OECD Framework, 15-20). In a democracy, that too is a lesson each of us from now on needs to learn from quite early in our lives.

3.5. The challenge of terrorism

Until quite recently the challenge of terrorism has principally been relatively intimate and local – a technique in communal struggle, a theatrical expression of wholesale political rejection, or an instance of individual psychopathology. Such weight as it has exerted has come from the prominence and plausibility of the targets it has chosen. Since September 11th 2001 it has had a quite different presence and a potential scope which it is ridiculous to ignore but far harder to foresee. In this new phase it has drawn together the potential of technology, globalization and the flow of information and fused each with the animosities of geopolitical competition and civilizational strife from very long ago. Indiscriminate mass murder is a disconcerting purpose in otherwise apparently peaceful conditions. In its simplest and most direct forms it is also impossible to prevent without impracticable levels of surveillance and prophylactic repression, which would be likely to strengthen the purpose and spread it far wider. You can think of it as incipient civil war or a struggle to hold, win or recapture the loyalty of its own citizens. In either perspective it is clearly by now no longer merely an instance of domestic policing, but more fundamentally a war of ideas (an ideological more than a purely military struggle).

This is a very different challenge from the threats of technological vulnerability, though the latter may raise the stakes in that struggle very sharply and in due course probably will. The initial impact of 9/11 was so dramatic because its scale, the prominence of its targets, and its striking destructive success were so unexpected. Nothing since has come close to matching it in any of these respects. Sooner or later the technical possibilities of doing harm on a vast scale will be actualised and, while most are far likelier to be deployed by an enemy state, little short of thermonuclear warheads is necessarily restricted to such users. As yet, in any case, the threat of technically advanced mass murder on a vast scale is more a classic case of the need for national defence than an educational or domestic political challenge.

What very much unites both dimensions of challenge is the war of ideas. Our societies far into the future will need to be quite highly policed if they are to continue to provide their citizens with levels of personal safety comparable with those they have recently achieved. How effectively they can do, so will depend on how far those citizens see and feel that need as common. The war of ideas will be a struggle to win and hold loyalty. It is already quite bitter in many European countries and far from negligible even in the United States. The more heterogeneous the recent origins of their present populations, the harder it is bound to prove for their citizens to share a common loyalty. The war of ideas will take a different form in the mosques and madrasas of their Muslim communities; but it is in the key institutions they share with all their fellow citizens, the nurseries, schools and

universities that they will need to find and forge a very practical solidarity with their infidel brothers and sisters. If we do not in the end win that war educationally, it is a war which in the long run we must all lose (OECD Framework, 15-20).

3.6. The challenge of ecological survival and recuperation

The final challenge our children must be educated to meet is also the sole one to hold a real threat of finality. We certainly now know that we have harmed the setting of our lives in ways we can never hope to repair; and we do not yet know whether we could limit the future damage we will continue to do fast enough to keep it habitable on the human scale we still expect to need it. It is already obvious that to do so would at least require a drastic and mutually supporting change in political will and individual attitudes across each of our societies of which it is still implausible that either is capable. Until it becomes clear that the effort is hopeless, it will remain individually and collectively demented not to make it as vigorously as we can. The principal task of every nursery, school or university from now on must be to do its best to ensure that everyone who enters it leaves at least recognizing that, and understanding the basic reasons why it is so. This is an educational task which some will welcome more than others; but it should disqualify anyone from teaching to deny or shirk it deliberately. A culture or skill set worth handing on needs a world in which to use and enjoy it. Now it is we who have the whole world in our hands. That is why we need to transform our educational systems as profoundly as we now do (OECD Framework, 15-,20).

4. Refashioning a democracy which can hope to take the strain

The democracy we now have anywhere is not the democracy we are going to need. To hold the whole world in our hands is an awesome new responsibility. It will require us to transform all our states and societies. The democracy we now need must enable us to discharge that responsibility. The democracy we have often does far more to impede us. It is ever more urgent to grasp why. To do so, we must first recognize that it is quite wrong to blame this principally on the structure of our institutions and insufficient to attribute it simply to their misallocation of power.

When the citizens of Athens chose together what their community was to do, they did in a distinctive way what innumerable human communities had done before them, and far more have gone on to do since. What was unprecedented in their way was the level of reflective and elaborately transmitted interpretation of the strengths and weaknesses of that way of doing so which it generated. It was the density and elaboration of that interpretation, not the detail of the institutions themselves, which in the very long run gave it the impetus and strength to spread across the world to a degree that no other political culture has ever done. What it provides is above all a medium for thinking together over time. It offers no guarantee of validity or even method of validation; and since the challenges of politics are severely practical and alter constantly, it cannot even ensure an accumulation of pertinent conclusions. But it makes it possible to learn together

indefinitely to recognize the novelty of challenges and reconsider the adequacy of existing practices. This is a capacity we already desperately need (OECD Framework, 15-16).

In their ancient setting the city states of Greece fashioned alongside democracy a second cultural form with an equally momentous future, the sciences of nature: a tradition not of esoteric knowledge but of mutually accountable inquiry. Unlike the understanding of politics, in the long run this proved strikingly cumulative. The result today is frequently a struggle between two rival claimants to authority: the equal entitlement of citizens to judge and choose for themselves, and the unmatched power of natural science to comprehend many aspects of the choices they must make. Neither culture is one which we can surrender, so we very urgently need each culture to improve its capacity to communicate with the other. At least in electoral democracies, the state cannot simply espouse either culture and enforce it on the other; and any other form of state will need a very high and continuous capacity for repression to succeed in doing so for any length of time. Viewed from the summit of a state the sciences of nature can have a reassuringly definite structure of authority until they come to the detail, while the mandate of the People is disturbingly fickle and their opinions shapeless and unimpressive. That is why electoral democracies over the last few decades have assigned so many key choices to institutions like central banks and regulatory agencies placed firmly beyond the reach of ordinary citizens. Technocracy in any form is a remedy for citizen incomprehension; but its political costs can be high and paying them grimly disruptive.

The central challenge to the democracy we need to fashion is overwhelmingly cultural. It cannot be met just by rebalancing the power to act or obstruct between different institutions, still less by hoping to waft power softly and silently out of this world. A world of global economic exchange by this point can only be one of vast disparities of power, much of it highly centralized in states and huge corporations; but it does not therefore have to be a world of oppression, either objectively or subjectively. In democracies at least, it should be the opinion of the public which rules; but in them above all accordingly, the opinion of the public needs to be up to the responsibility of doing so.

To make it so is primarily an educational task: the task to equip every child and adolescent not just for their fate on a global labour market, but also with the capacity to see for themselves where they are in time and space, what being there requires of them and what it makes possible for them. It is far harder to provide such orientation to a minimally adequate degree anywhere than it was even half a century ago, but also even more essential than it was then. Comprehension is the fundamental prerequisite for that kind of autonomy and none of us can create it for ourselves (OECD Framework, 9-13).

As yet we have very little idea how to alter the format of our existing politics to reflect that orientation; but it is quite obvious by now that we cannot safely leave it to their current routine dynamics to provide it for us. It took a very long time to develop the modern political party and appreciably longer to form the modern legislature, neither of which emerged in response to prior changes in the means of communication. We will not have time to proceed at that pace; but we must still reshape our institutions to face these fresh challenges, as those two institutions were shaped, through the medium of political conflict. At present the institutions we have inherited have for a considerable time been making their key political choice between individual consumption in the present and collective investment for the future in a deeply destructive way. They have done so throughout with the clear assent of a majority of their citizens. To change that choice fast enough those citizens will need in future to view it altogether more actively and alertly

and understand far better just what they have been doing by making it in that direction. To do so they will not just need personal independence, resilience and adaptability. They will also require far more social imagination. Even if there were no such thing as society, as Margaret Thatcher famously claimed, we would certainly from now on need to make one. Training our children predominantly to compete for themselves on a market is a deeply unpromising approach to doing so. The further and the more exclusively it is carried, the more profoundly it will destroy the capacity of our societies to offer either individual or collective well-being to their own members and share the world with others in peace and prosperity. It is for educators especially to recognize the scale of that threat and prepare their pupils to meet it together (OECD Framework 2030, esp 15-20).

Co-agency in the context of life span model of motivation

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1. Introduction

Individual development is a lifelong process that involves various gains and losses in different life domain (Baltes, 1997). The life-span model of motivation (Salmela-Aro, 2009) proposes that the demands, challenges and opportunities students encounter at the particular educational stage of their lives and related educational transitions channel students motivation. Motivation plays an important role in the ways in which students create new value, make choices and direct their own development (OECD, Education 2030). Students regulate and take responsibility of their development in terms of co-agency with their peers, teachers and parents. Students cope for tensions and failure experiences by adjusting their motivation on the basis of previous life transitions and life events and such an adjustment has consequences for students' well-being. The life-span model of motivation is guided by assumptions within the life-course theory of human development which emphasise on multiple interacting spheres of influence (Bronfenbrenner, 1979) and the temporal dimensions of human life (Elder 1998) According to the life-course approach human development is shaped by a set of principles including individualized agency, timing of events, linked lives and the embeddedness of development in its sociohistorical context. The aim of this paper is to deepen the concept of "student agency" and explore the concept of "co-agency", as part of the life-span motivation approach to co-agency.

2. Educational paths channel motivation

One of the many developmental tasks navigated by students are educational transition. Educational transitions are focal points for development and often coincide with developmental tasks in a number of other life domains. Educational transitions are associated with significant increase both in vulnerability and opportunity of the psychological, social and intellectual wellbeing of students. The vulnerabilities include negative effects on students such as increased stress, decreased self-esteem and reduced effort. Students must deal with changes in the organization and social structure of the educational setting for each educational transition. In turn, many students handle educational transitions well and educational transitions can also play a key role in student flourishing. Indeed a successful transition eases feelings of distress, resulting in a sense of wellbeing which may lead to better outcomes for developmental tasks (stage-environment fit model, Eccles & Midgley, 1989).

Students grow up in changing environments that channel their development. A variety of socio-cultural factors, such as educational structures, cultural beliefs and historical events define an opportunity space that affects students' motivation, emotions, thinking and behaviour. According to the life span model of motivation (Salmela-Aro, 2009) students direct their lives and manage their development in the context of various socially and culturally defined developmental tasks, institutional tracks, and educational transitions in terms of agency as setting and constructing personal goals. The focus on educational transitions is important as they represent societal imposed points at a particular developmental stage that all youth must navigate. Thus they form natural experiments as youth diverge across different developmental pathways, are psychologically critical where students are often faced with new challenges and a host of developmental tasks they must address and often present large scale upheavals in social networks via new or renegotiated relationships with parents, teachers and peers (Dietrich et al., 2012). In line with co-agency, past research shows that adolescents see their parents as highly influential during educational transition periods (Mortimer, Zimmer, Gembeck, Holmes & Shanahan, 2002; Tynkkynen, Nurmi & Salmela-Aro, 2010). Parental warmth, involvement and support may be seen as a resource which buffers the strain of educational transitions and related goal achievement reflected by higher effort, and lower levels of goal-related stress, resulting in higher likelihood of transition goal attainability (i.e., successful transition, Salmela-Aro & Little, 2007). Indeed, lack of engagement that is shared between parents and adolescents might lead to goal being externally motivated. When parents do not engage with educational task adolescents may attribute their goal to external social pressures, such as the pressure to have a career goal by the end of high school. This likely lowers effort and increases stress toward the educational goal, possibly resulting in an inability to attain it (Dietrich & Salmela-Aro, 2013).

The construction of goals that optimize students' potential to deal successfully with forthcoming educational transitions requires comparison of their motivation and the opportunities, challenges and constraints of their educational life phase. It is during adolescence when students develop aspirations for the future educational and occupational career. Aspirations and goals act like a compass (Salmela-Aro, 2009, OECD Learning compass, 2017) to help chart a life-span and direct the spending of time and energy in line with the Education2030 Learning compass. During adolescence two developmental tasks or institutional careers are of special importance education and

preparing for working life (Baltes, 1997; Steinberg, 1999). Developmental regulation is organized in action phases (i.e., Heckhausen, 2014) in terms of anticipation, action and reflection in line with the Education2030 model which are timed by the structure of the opportunities for attaining developmental goals. In the context of self-determination theory (Deci & Ryan, 2017) by comparing individual motivation to the opportunities that are available, students set personal goals that satisfy their psychological needs of competence, autonomy, relatedness and contribution and provide a basis for the future they want (see also Education2030). According to the life span model of motivation students socialization and development in the context of education can be described in terms of agency, and co-agency (Salmela-Aro, 2009).

Wellbeing is important for the quality of life, cognitive capacity, physical health and social productivity over the life course (Huppert, 2007; see also OECD for better life), and so successful educational transitions is an important concern for student agency, co-agency and wellbeing. Understanding how young people navigate these changes, while maintaining mental health and wellbeing is crucial. Successful engagement in educational transitions is often facilitated by co-agency with peers, parents and teachers.

3. Student agency including choice and voice

In the "Future We Want" narrative student agency is a key concept. The OECD learning framework 2030 proposes the concept of "student agency" as the underlying key concept. what the learning framework can do to guide learners for their future is to articulate what can give them a firm foundation as well as what can help them to navigate the as-yet-unknown, whilst rooting them in cultural and individual identities. Student agency is becoming an increasingly important concept in education, both as a goal and as a process. Haste (2001) suggested that a "competent human" is self-sufficient, able to focus attention and plan, has a future orientation, is adaptable to change, has a sense of responsibility, has a belief that one can have an effect and is capable of commitment. Perhaps now we would query the degree to which 'self-sufficiency' is a desirable or attainable goal (as distinct, say, from recognizing inter-dependence). Nevertheless, the notion of student agency appears to underpin the acquisition of these competencies. This calls for a continuous cycle of "anticipation-action-reflection" (see also Heckhausen et al., 2010: a learning spiral in which students can develop competencies through lifelong and life-wide learning. Student agency implies that students can have active interaction with one's environment, including active involvement in one's own learning and development (Haste, 2001). This approach is predicated on the proposition that without a belief in their power to impact their own future, and indeed that of the broader world, learners will be condemned to passivity: to the view that "there is not much we can do to change the future or to achieve a more preferable future than would ordinarily occur". This lack of a sense of agency, or powerless, itself leads to negative consequences: at the individual level, lack of motivation, indifferent decision making, depression; at the collective level passive unengaged citizens.

Students are not passive targets of environmental influences but rather students have their own agency, they create new value (see Education 2030 key competences), they make their own choices and select and create their developmental environments and future life paths (Baltes, 1997; Brandstädter, 1984). Many psychological factors such as motivation in terms of personal goals (Salmela-Aro & Little, 2007) and goal orientation (Pintrich, 2000), growth mindset (Dweck, 1986), life planning and related self-efficacy (Bandura, 1992), decision making, and related commitments are responsible for this mechanism. During this process they also create their career-related identity (Dietrich, Parker & Salmela-Aro, 2012). Students try to attain their goals and regulate their behavior in social context on the basis of co-agency. Goal attainment is not based on only self-regulation but reciprocal co-agency and co-regulation in social context. The key social contexts for student's co-agency in the context of education are peers, teachers and parents. During this social process students build responsibility (Dietrich et al, 2012; see also Education2030 transformative competencies).

The two processes agency and co-agency described in this paper are closely linked to motivation. First, the age-graded educational environments students face plays an important role in channeling the motivation and the related goals they construct. Students' goals differ and these differences reflect developmental tasks, opportunities and role transitions. For example when adolescents are asked about their personal goals, their answers typically focus on school-related goals, future education, peers and leisure activities (Salmela-Aro & Little, 2007). Second, students' personal goals are an important part of their agency. Students are active producers of their own life and direct their own life. The ways in which they make choices, create new value and select different directions for their future lives (Salmela-Aro, 2001). In other words students' agency plays a critical role for their learning, development and well-being. Optimal learning moments are moments when students feel interest, skills but also optimal challenge (Schneider et al, 2016). Students' educational expectations and aspirations predict their actual educational choices and attainment (Schoon & Parsons, 2002). The life span model of motivation suggests that personal goals that match the developmental tasks of a particular stage of life are adaptive in directing one's life and therefore contribute to well-being (Nurmi, 2001).

4. Co-Agency

Co-agency refers to the idea that educational transition represents shared projects and goals between youth, parents, peers and teachers. This does not only mean that parents, teachers and peers influence students agency, but also that students influence parents, teachers and peers: agency is bounded (Shanahan, 2000). In addition to students own agency, co-agency or relational agency (Edwards, 2006) is crucial for development and related well-being. Other people play an important role in educational goals and trajectories (Eccles, 2004; Nurmi, 2001). Co-agency refers to the idea that students, their parents, peers and teachers co-regulate reciprocally their development and wellbeing during the educational career.

Co-agency is important for students' agency in terms of goal construction and reconstruction. When students were asked to state their education goal-related social ties they mentioned parents, most often mother and second most often father (Salmela-Aro & Little, 2007). Next most often they mentioned their peers and then teachers. The father was mentioned more by boys and those with higher familiar socio-economic-status, while girls more often mentioned their mother. The results showed further that these education goal-related social ties predicted the transition from comprehensive school to academic or vocational track. Weak ties, such as teachers, predicted transition to a vocational track, while higher familiar socio-economic status and having a larger number of social ties predicted transition to academic track when academic achievement was controlled (Salmela-Aro, 2007). Supportive weak ties might thus help students to beat the odds. Each social context, peers, parents and teachers have their own reciprocal contribution to students motivation, achievement and wellbeing during educational career (Kiuru et al., 2015)

4.1. With Peers

In addition to parents and teachers, peers are among the most important social context for students (Rubin et al, 1998). The important role of peers for students' co-agency increases during adolescence. Through interactions with their peers, students acquire a wide range of competences, skills, attitudes, values and experiences (Rubin et al, 1998). During adolescence, youth spend greater amounts of time with their peers; hence, the norms and characteristics of peer networks become increasingly important co-agency socializing agents (Ryan, 2000). Recently, also the role of social media has become the key pathway to co-agency with peers among the iGen generation (Salmela-Aro et al, 2016; Hakkarainen et al, 2016).

Peers' academic norms may be immensely influential over each students' own academic engagement, beliefs, and achievement (Rodkin & Ryan, 2012; Ryan, 2000). The members of students peer groups have been found to have many features in common, such as age, gender and race, family background, external and internal problem behavior (Stattin et al, 2010). It has been found that students who belong to the same peer group at the end of comprehensive school shared similar socio-economic background, educational goals and trajectories later on (Kiuru et al, 2012). Peer group members also resemble each other in their broader academic orientation, that is how well students performed at school, whether they expected to enter upper secondary high school (academic track) and whether they actually did so and entered the academic track (Kiuru et al 2012). These results show that the pathway from educational goals to educational trajectory was shared by the peer groups members. Research in academic settings has shown that students peer groups resemble each other in academic achievement (Ryan, 2001) and educational aspirations and expectations (Kiuru et al, 2008). It has also been shown that students consider their peers as important sources of information when planning their future, including education (Malmberg, 1996).

Adolescence is a developmental period characterized by the desire to "fit in" with peers (Hamm, Farmer, Lambert, & Gravelle, 2014). In an effort to fit in, students may begin to adopt the academic values and behaviors of their peers to avoid the embarrassment and rejection that accompany nonconformity to peer norms. As such, students often find themselves spending time with peers who possess similar beliefs and behaviors (e.g., Kindermann, 2007; Parker et al., 2015; Rambaran et al., 2016). For example, research has shown that peer groups often exhibit similar levels of deviant behavior, and that

frequent aggregation of deviant peers into the same settings may exacerbate the deviant behaviors of individual members. In addition, frequent association with deviant peers via processes such as educational tracking or intervention programs aimed at reducing problem behaviors often leads to increases in deviant behaviors among individual group members (Dodge, Dishion, & Lansford, 2006; Li et al., 2011). Likewise, peer groups also possess similar academic behaviors and aspirations. Research on academic socialization indicates that students are more likely to seek out peers with similar academic achievement, and that these peer affiliations influence achievement over time (Ryan, 2001; Shin & Ryan, 2014b). Friendship networks have also been found to influence both academic motivation and achievement among adolescents (Blansky et al, 2013; Molloy, Gest, & Rulison, 2011). Students have tendency to choose new peers based on earlier similarity in school-related behavioral engagement and over time students became more similar to their peers in terms of emotional, cognitive and behavioral school engagement (Wang et al, in press).

Understanding how students process the behaviors of their peers to determine their selection of friends has important ramifications for improving adolescent behavioral engagement in school. Finding suggests that assembling deviant peers within the same setting might actually reinforce or worsen deviant behaviors (Gifford-Smith, Dodge, Dishion, & McCord, 2005). Highly truant students are at increased risk for continued truancy if consistently grouped with other deviant peers, which may occur in academic settings that use ability tracking or grouping methods. Alternatives to such strategies include pursuing therapeutic interventions that have an individual focus, and allowing students with behavioral problems to be mainstreamed in general classroom environments (Dodge, Dishion, & Lansford, 2006). By eliminating the amassing of truant peers, schools may be able to limit students' identification and selection of other truant peers as friends, thereby reducing additional negative socializing influences. For emotional and cognitive engagement, which is more likely to be socialized, making sure high-risk youth are never consistently placed in disengaged peer groups may reduce negative peer influences on beliefs and attitudes toward school. Teaching both educators and peers to reinforce positive learning beliefs, and targeting peer leaders as agents of change, may also foster positive peer influences on emotional and cognitive engagement (Kindermann & Vollet, 2014; Miller-Johnson & Costanzo, 2004).

High-achieving students with high stress tend to select peers with similar levels of school stress (Wang et al, 2017). Some high-achieving students may experience greater school stress due to the stress of advanced course workloads and high expectations of success based on past performance. Placing pressure on themselves to do well, these students may seek out peers with shared levels of emotional disengagement as a coping mechanism, and their commiseration with like-minded peers may be productive as they navigate the challenges of school (Rice, Leever, Christopher, & Porter, 2006).

While high-achieving students with poorer emotional engagement are more likely to select peers with similarly low levels of emotional engagement, they are not more likely to be influenced by their emotionally disengaged peers. Rather, academic achievement seemed to serve as a buffer for students with high school value, whereas youth with low achievement but high school value were far more likely to be socialized by their poorly engaged peers than by their highly engaged peers (Wang, et al, 2017). These findings align with the risk and resilience model examining the protective role of inner resources and external supports in helping youth cope with adversity (Kiuru et al., 2008; Shin & Vollet, 2014). With fewer inner resources to rely on, students with lower achievement, coupled with high school value, may be vulnerable to peers with negative feelings toward

school. In an effort to build affiliation, they may engage in mutual discourse regarding their discontent with school, feeding off peers' feelings of discontent, further decreasing school value (Ryan, 2000). Conversely, high achievers' academic success and positive attitudes toward school may be reciprocal, making these students more resilient to negative peer influences. In addition, some research has suggested that academically oriented students are socially penalized by peers, as performing well and caring about school are viewed as "uncool" (Schwartz, Kelly, & Duong, 2013). However, this may be not the case, as academic success does not appear to sway students towards their peers' negative views. Instead, students holding positive school value benefit from high academic achievement, as they are more likely to be influenced by peers with high school value.

Moreover, in the time of digitalization, it is becoming increasingly important that today's students be empowered to navigate in social and digital space and time and to manage their lives in meaningful and responsible ways. To do so, students should be able to travel across a wide variety of contexts (Kegan, 2001). Students should be equipped with competencies for travelling in time (past, today, future) and in social space (peers, family, community, region, nation, world) as well as in digital space to actively take part in different spheres of life. They need to encounter and engage with the natural world, to appreciate its fragility, complexity and its value. Thus, future education systems should support students to be able to navigate across digital contexts.

4.2. With Parents

During development parents can be seen of as a resource for student agency. Parents who meet the students changing needs provide a better match for the students and the developmental task at hand. This co-agency in turn shows to be associated to a greater well-being (Chirkov & Ryan, 2001). Current research suggests that parents and adolescents can mutually influence, co-regulate each other (Dietrich et al, 2012). Therefore students' wellbeing may influence what parenting style is used (Nurmi, 2012).

Students' family background has been found to play an important role in their educational aspirations and motivation. For example, students from lower socioeconomic status (SES) tend to have lower educational expectations and aspirations (Schoon & Parsons 2002) and lower educational attainment (Schoon, Parsons, & Sacker, 2004) than those from families with high SES. Also the results show that there is co-agency in academic engagement and burnout. Academic burnout and engagement are shared in a family: parents and students in the same family co-regulate their academic burnout and engagement in terms of co-agency (Salmela-Aro, Tynkkynen & Vuori, 2012).

One of the many developmental tasks navigated by students and their parents is educational transition. Educational transitions are associated with significant increase in vulnerability of the psychological, social and intellectual wellbeing of students including negative effects on students such as increased stress, decreased self-esteem and reduced effort. Parents can help the students to deal with changes in the organization and social structure of the educational setting for each educational transition.

Relationship with parents is organized around socialization-related developmental tasks. As the relevance of the socialization task change with developmental tasks that youth face as explained in the stage-environment fit theory, socialization approaches have to change too (Laursen & Bukowski, 1997). Thus a model that takes the parent-child reciprocal relationship into account should be a developmental model. A developmental model

should be sensitive to young people's abilities and needs, how they change with age and development and how the methods to support these needs change, something that is often overlooked in research on effects on parenting (Laursen & Bukowski, 1997). When young people become older and mature, parents approach to parenting should adapt to the child's changes. Parent approaches to parenting change throughout development and that changes in parenting is co-regulated, supporting the idea that development is a transactional process (Beveridge & Berg, 2007). Although it is hard to establish a standard development trajectory for everyone, there are basic changes in human development that are consistent across cultures. Adolescence is a critical moment for autonomy need satisfaction (Wray-Lake et al, 2011) and so autonomy support is essential for a positive development. Since a salient developmental task for adolescents is to establish of oneself as an autonomous being (Steinberg, 1990). Stress during adolescence often comes from autonomy versus control that is provided by the family. As children get older the relationship between a parent and child often becomes asymmetric. Adolescents want to become increasingly independent and responsible of their own lives (Smetana, 2000). This is likely to lead to adolescents questioning the authority of parents and push for more decision making power, and thus more interdependence. Although not providing autonomy can lead to maladaptive outcomes, providing autonomy through too much interdependence, too early, can also cause problems (Dishion, Poulin & Medici Skaggs, 2000) and may also be useless for children that are too young to understand explanations of consequences of potential bad behavior. It is important to provide autonomy but this should be in an age appropriate manner for optimal benefits to the child's developmental outcomes (Ryan & Deci, 2017). By the time young people reach adolescence parents seem to still need to decide on the right balance between autonomy and control. In line with co-agency, parental autonomy support may be seen as a resource which eases the strain of developmental tasks and allows adolescents to take advantages of the new affordances offered by the educational transitions and thus experience greater wellbeing. Parents that promote volitional functioning encourage their child to take initiative, are willing to take the youth's perspective, teach the child to act genuine preferences, provide meaningful choices, and provide a valid rationale when there is limited choice available (Ryan & Deci, 2017). With this co-agency in mind parents that are responsible and developmentally sensitive to the adolescent's needs and experience serve as a resource that buffers against detrimental resources of stress and a promotive resource that increases wellbeing. Autonomy support from parents can act as both a protective factor against ill-being for students going through the critical educational transitions through middle school, high school and post high school transitions. Promoting students wellbeing is essential for students to be able to tackle tough developmental tasks, such as educational transitions to their full ability. This may be achieved through co-agency with parents proving their children empathy, take the child's point of view, providing reasons for behavior, give choices, guidance rather than demands and provide discourse about values (Ryan & Deci, 2017). This makes it easier for students to identify their own struggles and concerns, support their wellbeing and protect against ill-being. Wellbeing is important for the quality of life, cognitive capacity, physical health and social productivity over the life course (Huppert, 2007; see also OECD for better life. Successful engagement in educational transitions is often facilitated by co-agency with parents. Parents can potentially support young people in the educational transition and parental involvement predicts adaptive outcomes for students, such as school achievement and well-being (Ryan & Deci, 2017).

New research shows that parents remain important across adolescence and educational pathways. It is common misunderstanding that parents become less important as students

grow up. As argued by Ryan and Lynch (1989) even as adolescents gain independence in various domains of life, parental support for autonomy continues to be critical to wellbeing. Indeed educational transition success is not only affected by personal capabilities but also by co-agency, support from the family context (Dietrich et al, 2012).

Previous research has emphasized that it is important not only to consider adolescents' own educational goals and behavior, but also the influence of other significant relationships, such as parents (Furman & Buhrmester, 1992). Adolescents and their parents share their goals. For example, adolescents try to achieve their goals by sharing their hopes and dreams with their parents, making this relationship a two-way street (Salmela-Aro, 2009). Co-agency and related co-regulation refers to the idea that educational transitions represent joint projects between youth and their significant other. The success of these joint projects has implications for aspects of phase adequate engagement such as processes of goal attainment (i.e. goal setting, striving, and disengagement). Consequently, transition success is not only affected by personal capabilities but also by support from the social context. When these parental ties are supportive, motivation is fostered and goal attainment became more likely. Supportive ties help to successfully negotiate and attain them. Adolescents may not feel competent in their goal pursuit without an environment that provides support through setting of behavioral expectations, clear guidelines or task-focused feedback (Farkas & Grolnick, 2010). Parents and children mutually influence each other; consequently parents influence adolescent's self-development and play an important role in educational goals and educational trajectories but may also themselves be influenced by their children (Nurmi, 2004).

Advancement in technology has made sophisticated observation studies possible by recording parent-child interactions in meticulous detail. Such a precise coding of sequences for observations has made it possible to do moment to moment analyses (Maccoby & Martin, 1983). These analyses showed that mothers did not only direct a child but also adapted their interaction to their child's state of attention (e.g. through the use of imitation). Thus parent-child interaction is much more sophisticated than initially thought and they are not unidirectional. Such bidirectional interaction helps develop the child's social capabilities and led to a reciprocal system of socialization. In this way a social learning approach to parenting has been modified into a social-interactionistic approach (Patterson, Reid & Dishion, 1992).

Co-agency and the effectiveness of autonomy supportive parenting during educational transitions can be explained by the stage-environment fit theory (Eccles, 2007). Optimal development occurs when the needs of a student fit with opportunities in different educational phase of life (Eccles & Midgley, 1989). Mismatch between the needs and the environment can have negative influences on behavior motivation and wellbeing (Gutman & Eccles, 2007). The mismatch between autonomy need and autonomy support may be particularly problematic during transitions in which students are expected to take on more responsibility and direct agency and control over the course of their lives (Zarrett & Eccles, 2006). In line with co-agency, parental autonomy support may be seen as a resource which eases the strain of developmental tasks and allows students to take advantages of the new affordances offered by educational transitions and thus experience greater wellbeing (Salmela-Aro & Little, 2007). Autonomy supportive parents provide their child with choice allows them to participate in decision making and encourages independent problem solving (Grolnick & Ryan, 1989). This is characterized by parents who provide choices and the change to give opinions to their children when possible, support their children to act in their own interests, support their children to cultivate their

own values, and are empathetic to the perspectives of their children. This, in turn, makes it possible for adolescents to self-govern because they get a chance to act through their personal interests, values and goals and are made aware of those. With this co-agency in mind parents are responsive and developmentally sensitive to the students' needs and experience serve as a resource that buffers against detrimental resources of stress and a promotive resource that increases general wellbeing. Developmental tasks such as educational transitions are events which trigger the need for increased responsibility and independence (Zarrett & Eccles, 2006). Parental behaviors that are consistent with autonomy support include taking students perspective , providing relevant choices and encouragement to take agency (Ryan et al, 2016) Autonomy support before the transition prepare for students for this increase allowing students to flourish (Duineveldt et al, in press).

Parenting does not only affect youth but young individual also influence their parents. There is a range of literature that explains that youth's behavior and experiences influence a parent's behavior. For example, parents have been shown to become more controlling when children show poor academic performance in school (Grolnick, Gurland, Jacob & DeCoursey, 2002; Pomerantz & Eaton, 2001). However understanding the effects youth have on their parents has thus far been rather scarce in the literature compared to our understanding of parenting effects on youth. However as development is a joint co-agency project co-operationally shared by parents and children, these bidirectional influences need much more attention in the future.

4.3. With Teachers

Teachers play a key role for student's co-agency: Teachers influence their students. Teachers help to create optimal learning moments for students (Schneider et al, 2016). These are moments when student feel optimal level of interest, skills and challenge. However, students also have agency and are important agents of their own development and may equally have an impact on their teacher's instruction and teacher-student interaction. Students are active agents who have an impact on what is happening in their classrooms and their individual characteristics evoke different responses in their teachers. Supporting co-agency recent meta-analysis (Nurmi, 2012) revealed that students characteristics play a more important role in classroom than has previously been thought. The results showed that teachers reported more conflict and student dependency and less closeness in teacher-student relationship when interacting with students who exhibited either a high level of external or a high level of internal problem behavior. In contrast, teachers reported less conflict and more closeness in teacher-student relationships when interacting with students exhibiting high levels of motivation and engagement as compared to other students. When students are engaged and motivated teachers find teaching more enjoyable, show more teacher-student support, and report more involvement than in the conditions where students are passive and uninterested (Hugnes et al, 2008). Furthermore, teachers reported less conflict, less student dependency and more closeness in teacher-student relationships when interacting with students showing a high level of academic performance. High achieving students receive more emotional support and positive affect from their teachers (Babad, 1990). However, low achieving students have also been found to receive more instructional support and active instruction from their teachers (Babad, 1990).

The notion that a particular students academic performance activates a certain kind of instruction can be described as students evocative impact on teachers instructional

practice (Nurmi et al, 2013) and as a process of co-agency between teachers and students (Salmela-Aro, 2009). Besides having general pedagogical knowledge concerning classroom management and subject matters, teachers also construct knowledge with regard to particular student. By constructing student-related knowledge teachers are able to plan their teaching tasks and can design appropriate instructional content. Second, students and their characteristics also activate affective reactions among their teachers. Some studies suggest that major source of teachers positive emotions such as satisfaction are students' successful learning outcomes and progress. Teacher's emotions may then also have important consequences for the kind and amount of instruction they direct at a particular student in their class.

However, teacher and education systems should not reproduce the social inequality nor the environmental exploitation that exists today. Systems must no longer focus only on achieving excellence and innovation, at the cost of the disengagement of the under-served and disadvantaged. Education systems should no longer consider that everything can be or should be taught in school. Education systems should not assume that teachers or textbooks can suggest all the solutions to problems students are given in classrooms; students are likely to face real-life problems that teachers or textbooks may not have answers for. Thus, education systems should offer quality learning opportunities to all students through which they learn to navigate themselves in identifying issues, creating several responses to these issues, and selecting a response that seems fit for a particular given context. They need too the analytical tools to assess which solutions hold the most potential for success.

5. Agency and co-agency for achieving individual and collective well-being in 2030

The OECD's Better Life Initiative: Measuring Well-Being and Progress presents 11 dimensions of individual well-being, including housing, income, jobs, community, education, environment, civic engagement, health, life satisfaction, safety and work-life balance that contribute to societal developments, including economic capital, human capital, social capital and natural capital. These societal resources will also return to and contribute to individual well-being

Wellbeing is important for the quality of life, cognitive capacity, physical health and social productivity over the life course (Huppert, 2007; see also OECD for better life), and so successful educational transitions is an important concern for student co-agency and wellbeing. Understanding how young people navigate these changes, while maintaining mental health and wellbeing is crucial. Successful engagement in educational transitions is often facilitated by co-agency with parents. Parents can potentially support young people in the educational transition and parental involvement predicts adaptive outcomes for students, such as school achievement and well-being (Ryan & Deci, 2017). Co-agency refers to the idea that transition represents shared projects and goals between student, parents, peers and teachers. This co-agency does not only mean that parents,

teachers and peers influence students, but also that students' influence parents, teachers and peers.

6. Relevance to achieving the future transformative competencies

Specifying a set of transformative competencies which empower today's students to shape the future, to contribute to his or her own well-being as well as the well-being of others and the environment implies an attempt to explicitly value some competencies over others. The OECD "Learning Compass" suggests direction towards the "Future We Want". For learners, where they want to be, individually and collectively in the future, is a fundamental starting point to how they utilise their skills and knowledge. The learning compass aims to enable the learners to clarify their own vision - where they want to be, locate their current position in comparison with the future vision, and navigate with confidence the way forward. This is the best legacy we can confer on today's learners. They will need to find solutions to economic, social and cultural challenges which our generation has yet to solve or even recognize. We will need to work together - children, students, youth, adults, and elderly – towards the same direction to make our "future we want" a reality.

Part of education's task must be to enable the learner to locate herself in wider and interrelated co-agency social and environmental contexts. The 'Learning Compass' OECD2030 is introducing could be conceived as enabling learners to acquire a sense of personal agency and purpose, orientation toward the future and a meaningful life plan as well as co-agency. Critical to this will be the possession of a sound personal identity or self-concept and the ability to translate, in a responsible way, needs and wants into acts of will: decision, choice, voice, and action. It is about acting rather than being acted upon; shaping rather than being shaped; and informed choosing rather than accepting choices determined by others (OECD Education2030 Learning Compass) . However, acting and operating responsibly and effectively in and on the world does not mean functioning in social isolation, nor does it mean acting solely in self-interest. In the discourse exploring responses to mega global trends such as the 4th industrial revolution or the planet at risk, the following skills are often emphasised: creativity, empathy, dealing with ambiguity, engagement with uncertainty, stewardship, patience, sense-making, mind-shift, adaptation in the face of disruptive change, long-term thinking and anticipation and many others. Through the acquisition of these skills, it is argued, students will be well equipped to tackle complexity in a manageable way. The OECD 2030 learning framework aims to support students to acquire a tool, a compass that can guide them to shape the world in 2030 by thriving in a structurally imbalanced world through coping with conflicts, contradictions, trade-offs, ambiguity, creating new value to the world, and taking responsibility to keep the world in balance.

6.1. Achieving new value

Achieving new value is closely connected to student co-agency. Through their co-agency students create new value. Creating new knowledge for, and adding new value is crucial

to be able to tackle with the future challenges. Co-agency is needed to be able to create innovative new value and to tackle with the challenges, such as climate change. Co-agency in this context can be approached through social engagement (Wang, 2016). According to social engagement students create new value through building on others ideas, sharing ideas, argumentation, tolerance, trust, and collaborating. It is thus important to note that innovation is not a predominantly individual preserve but builds on sharing ideas. Now, more than ever, it requires processes of co-creation for which skills such as cooperation and collaboration are increasingly important as well as the capacity to connect existing knowledge to create new knowledge.

6.2. Taking and developing responsibility

Taking responsibility is closely connected to co-agency. Through co-agency with their peers, parents and teachers students create, develop and take responsibility during their development.

The perception and assessment of what is right or wrong, good and bad in a specific situation is related to ethics and it is a key component in student's global competencies. It implies asking questions related to norms, values, meanings, and limits such as: What should I do? Was I right to do that? Where are the limits? Knowing the consequences of what I did, should I have done it? Answering these questions with critical thinking skills requires also the cognitive and metacognitive process by which students evaluate and choose among alternatives consistent with ethical principles. This assumes an overall understanding of the meaning of things, actions, events, experiences and critical values. Thus taking responsibility develops particularly during adolescence.

6.3. Coping with tensions

Students need to navigate in a global, interdependent, complex, multipolar, rapidly changing, diverse, conflict-affected, fragile, and uncertain world in the future. Students need to be able to be prepared to be able to deal with setbacks, tensions, dilemmas, trade-offs, and ambiguity in a constructive, future-oriented way. Taking a future-oriented long-term perspective, going beyond the either-or, will be critical in the future. There is not one possible solution and thus to be able to deal with tensions, dilemmas and trade-offs together students need co-agency by integrating seemingly contradictory or incompatible goals as aspects of the same reality. To be prepared for the future, individuals have to learn to think and act in a more integrated way, taking into account the manifold interconnections and interrelations between contradictory or incompatible ideas both in short- and long-term perspectives. In the light of the increasing cultural and social diversity and the existence of social, economic and ecological imbalances, dealing in constructive ways with differences, contradictions, and ambiguities is needed for the future.

During the educational life span students find themselves facing certain role transitions and receive feedback about their success, tensions and failures in coping with them. This feedback on developmental outcomes requires students to cope with the tensions (see Education2030 transformative competencies), and adjust their goals, plans and thinking in order to successfully cope with the future tensions and challenges. During educational career, students always face both successes and failures and it is important for students to learn to be prepared for these possible setbacks and tensions they face during educational career.

Students need to cope with tensions and failures and adjust their motivation and related personal goals to deal with their changing educational and life situations as the demands, challenges and opportunities students experience change due to their earlier decisions, commitments and related role transitions (Heckhausen, 1999). Previous studies have shown that students need to adjust their personal goals to cope with change in their goal environment. Students try to adapt and cope for tensions and failure experiences and to adjust to the constraints of a given developmental ecology (Heckhausen, 1997). It has been argued that successful management of normatively less expected life events and educational transitions require from the student a greater degree of self-regulatory skills than the management of normative events (Wrosch & Freund, 2001). With regard to the mastery of non-normative developmental demands, students may have to play a more important and active role to cope for a lack of social structuring and normative orientation. Success or failure to function as a timing scaffold for investment in goal striving by students as they approach a specific goal. However students do not always achieve their goals. The distress that is likely to ensue when valued goals are lost is well-documented. According to the incentive-disengagement theory of depression (Klinger, 1977), goal failure or loss is related to distress and depressive affect. In addition, thinking about the goals that are no longer attainable is related to psychological distress (King & Hicks, 2006). Moreover, lack of success may serve as a signal may serve as a signal for the activation of coping strategies such as goal disengagement and self-protection. According to the life-span model of motivation, coping with failure expectations and tensions and adjustment of goals to accord with the present life situation is related or leads to well-being (Salmela-Aro, 2009). Intervention studies have revealed the key role of preparedness for possible setbacks and tensions to promote successful navigation during the educational transitions and related wellbeing (Salmela-Aro et al, 2012).

To deal with tensions, dilemmas, trade-offs nexus, ambiguity, non-simultaneity, and non-linear processes in a constructive, future-oriented way. Taking a long-term perspective, going beyond the either-or, will be critical in the future demands that we avoid rushing to a single answer, to an either-or solution, but rather deal with tensions, dilemmas and trade-offs – for instance, between equity and freedom; autonomy and solidarity; efficiency and democratic processes; ecology and simplistic economic models ; diversity and universality; and innovation and continuity – by integrating seemingly contradictory or incompatible goals as aspects of the same reality

Choosing between ambiguous or contradictory positions and actions is not, in itself, challenging; the challenge, which must be incorporated in key competencies, is dealing reflectively with multiple, dynamic and often conflicting aspects and recognizing that there may be more than one solution or solution method. To be prepared for the future, individuals have to learn to think and act in a more integrated way, taking into account the manifold interconnections and interrelations between contradictory or incompatible ideas, logics, and positions both in short- and long-term perspectives. In short, they have to learn to be systems thinkers.

7. Conclusion

In the current paper the key focus was on the key mechanisms of agency and co-agency in the context of students' life-span model of motivation in educational context (Salmela-Aro, 2009). Co-agency does not only mean that parents, teachers and peers influence students' agency, but also that students influence parents, teachers and peers agency-agency is co-regulated and shared. Peers, teachers and peers play a key role how students create new values, take responsibility and cope with tensions and challenges towards the future they want and related future well-being (see Education2030 key competencies). During the generation of digital natives Learning Compass as App can help students to navigate in this storm of educational path towards the future they want. Among the eGen generation, co-agency takes more and more place digitally.

8. References

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Student Agency: The Impact of Adversity

Vishal TALREJA

1. Impact of Adversity

- 59% of Indian children have stunted growth. ~ *The HUNGAMA Survey Report 2011*
- Children who are abused are nine times more likely to experience psychosis in later life. ~ *Read & Bentall, (2013), see Dissociation. Kennedy, Kennerley & Pearson. Routledge (2013)*
- It has been established that children who fail to thrive – a) Have poorer cognitive abilities (e.g., *Mackner et al. 1997*). b) Poor information processing (e.g., *Kennedy, Kennerley & Pearson, 2013*). c) Higher brain pathology (e.g., *Korzekwa et al. 2009*). d) Poor brain development (e.g., *DeBellis et al. 2011*). e) High anxiety levels (e.g., *Essex et al. 2002; Van der Vegt et al. 2010*)

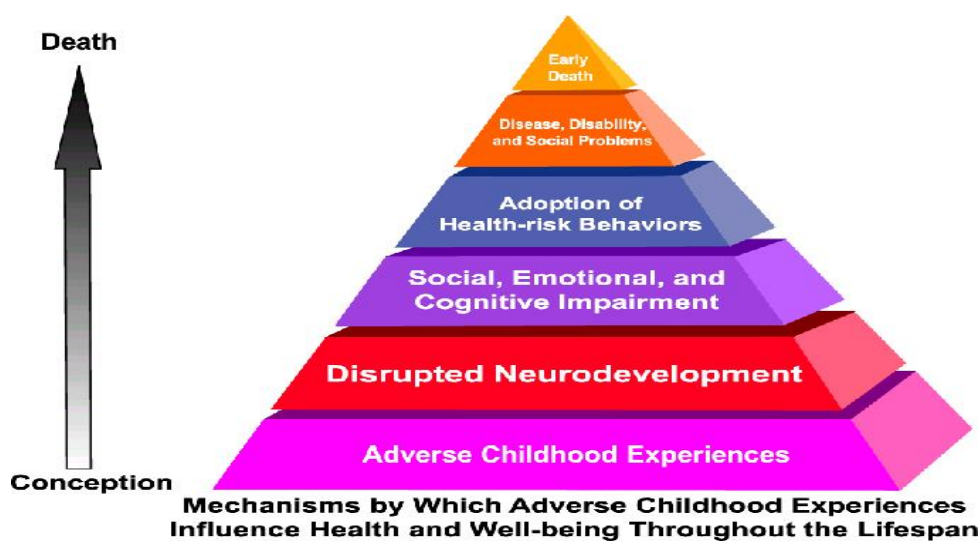
Figure 1.1.



Adversity, including malnutrition, has had irrefutable effects on child development and mental health resulting in challenges throughout life. The cost of damaged childhoods to a nation is immense. Correlational evidence between an adverse childhood and some of the most debilitating social problems that include unemployment, violence, crime, alcoholism, apathy, poor economic choices and a range of physical and mental health disabilities has been available for some time in the Public Health domain. In the 1990s the Center for Disease Control in the United States and Kaiser Permanente, a major

insurance firm, initiated a large scale epidemiological study, that has since come to be referred to as the ACE (Adverse Childhood Experience) study, when it was noticed that a multitude of health and social problems that include chronic heart and lung disease, obesity, alcoholism, inability to benefit from schooling, imprisonment, depression, intimate partner violence, sexually transmitted disease, adolescent pregnancy and early death occurred in clusters. Digging deeper they found that what was common was a childhood experience of abuse, neglect, and family dysfunction. Since then a large amount of data has been collected worldwide from several countries corroborating this finding. But why or how adverse childhood experiences lead so inevitably to a web of pathological and maladaptive behaviours later in life was not clearly understood and remained a scientific gap for long hampering the designing of effective interventions.

Figure 1.1.



However, in recent years, as a consequence of a deeper understanding of the early stages of human brain development, this gap has been bridged and substantial evidence is emerging to support a causal relation between adverse early experiences and negative life outcomes. Research findings from several disciplines are converging to reveal a story of how our early experiences shape the architecture of our brains and how in doing so largely determine our destiny. (Source: <https://web.archive.org/web/20160116162134/http://www.cdc.gov/violenceprevention/acestudy/pyramid.html>)

India, for example, has approximately 160 million children in poverty: The growth of up to 59% of rural and 48% of all children is stunted. The United Nations Children's Fund (UNICEF; 2009) reported that 42% of India's population was surviving on less than US\$1.25 per day, and around 160 million of the 460 million young people in India under 18 years old were living below this international poverty line. It was estimated in the *Hunger and Malnutrition (HUNGaMA) Survey Report 2011* (Naandi Foundation, 2012) that 42% of children aged under five years in India were underweight, and the growth of up to 59% was stunted. According to the *Children in India 2012 Report* (Ministry of Statistics and Program Implementation, MOSPI, Government of India, 2012), in 2006, the growth of 48% of children under five years was stunted (below average height-for-age), 20% were wasted (low weight-for-height), and 42% were underweight (low weight-

for-age). MOSPI predicted an improvement in these figures of 3 percentage points per year. These problems were reported to be mainly due to malnourishment. This poor growth pattern indicates developmental delay, a phenomenon that has been observed for over a century, and is known as *failure to thrive*, which is associated with a range of mental health and developmental issues (Schwartz, 2000) caused due to ACE. Interventions to address malnutrition include supplementary feeding, health education, and social improvement programs. Interventions to address the psychosocial problems caused due to ACE accompanying failure to thrive include promoting the acquisition of life skills (World Health Organization [WHO], 1997), via programs involving direct teaching of life skills as well as using sport, creative arts, adventure camps, empathy based pedagogies, transformative pedagogies, experiential learning approaches, play based learning, mentoring and befriending. The aim is to ameliorate the effects of adversity by providing social and self-regulation skills to enhance development, develop agency and enable young people to become healthy adults who can participate fully in the life of the community.

2. Failure to Thrive

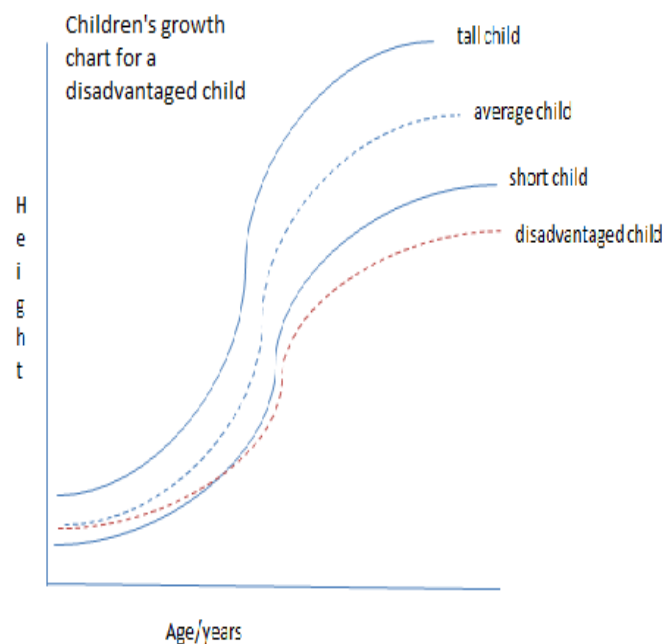
In 1897, L. Emmett Holt coined the term “ceased to thrive”. Later, in the 1960s, failure to thrive was referred to as *reactive attachment disorder* in the *Diagnostic and Statistical Manual* classification system, reflecting its connection with developmental delay and mental health problems (Schwartz, 2000). Stunted growth has been shown to predict developmental delay (Abubakar, Holding, Van de Vijver, Newton, & Van Baar, 2010). *Failure to thrive* can be defined as a child not growing at a predetermined rate as measured by a growth chart.

Figure 2.1



Normally, children grow in a set pattern, as shown by their measurements (e.g., height, weight, head circumference) plotted on growth charts. Stunted growth is often used as a key indicator of failure to thrive as it is very apparent and easy to measure. Many disadvantaged children's growth patterns are abnormal in that they show changes in, or deviations from, the expected patterns of growth shown on the chart (e.g., below the 3rd centile on a growth chart or crossing major centiles), and these changes and/or deviations generally indicate failure to thrive. *Nonorganic failure to thrive* is defined as a failure of growth with no organic reason, for example, abandonment, trauma, abuse, or ACE.

Figure 1.2



Organic failure to thrive is due to an illness or malnutrition, and has effects on development similar to nonorganic failure to thrive. Failure to thrive brings with it a package of problems including attachment disorder problems, for example, cognitive impairment, emotion and behaviour regulation difficulties, and neuropsychological abnormalities (MOSPI, Government of India, 2012; Pearson, 2013; Read & Bentall, 2012). These cognitive deficits impact on areas such as attention, memory and information processing, relationship difficulties associated with insecure attachment (e.g., being unable to tolerate closeness, attaching quickly to possibly inappropriate others, being unable to assert oneself, and poor parenting skills in adulthood), emotion regulation difficulties (e.g., being highly sensitive/insensitive to stress, lack of self-soothing and calming abilities, and experiencing extreme and inappropriate emotion and perceiving this as uncontrollable), and behavioural problems (e.g., self-harm, aggression, social withdrawal, avoidance of challenging opportunities, and absconding). In addition, because of impoverished environments, different social norms, and the deficits already described, young people can develop attitudes and beliefs that prevent them from participating in a wellbeing-oriented world.

For those of you who may have been in a shelter or been in contact with very disadvantaged children, you may have experienced that children often hold on to you or

hold your hand. You can end up with three, four or five children holding on to you. For most adults, this feels good and the children appear very cute. We can often feel that we are somehow contributing to these children by being close to them. If you have had children yourselves or know of friends or family with children you would probably see a very different process if a stranger came into the room. Most young children in families will play ‘peek-a-boo’ whilst hiding behind mum and physically hanging on to her. This is normal development which keeps the child safe whilst it explores the world around it. The child in the shelter who holds on to a stranger feels love but in fact is showing damage. It is safe to hold on to you but that child would also hold onto a stranger at the bus stop or a person who gives them a sweet etc. This means that a vulnerable child (with a range of possible problems) may be even more vulnerable as they approach strangers. Consequently, inability to recognize and develop healthy relationships due to failure to thrive can lead to complex and sometime abusive or violent relationships with adults.

Have you ever see an infant jump out of the cradle and start running? Just like there is a sequence to an infant learning to crawl, learning to stand up, learning to walk and then run; social and emotional learning also has stages of development. When a child misses out on those sensitive periods when social and emotional learning happens, the child is always catching up to development.

Failure to Thrive affects the normal child development cycle impacting growth milestones. When a child misses out on sensitive periods when social and emotional learning happens, the child is always catching up to development. This is prominent and pronounced amongst children from disadvantaged backgrounds resulting in stunted growth or failure to thrive.

3. Pace of Change in the World

- “57% of students in the country are educated but are not adequately prepared for employment.” ~ **Pearson Voice of teacher Survey 2015**
- “Over 90% of India’s labour force still works in the informal sector, due to a lack of focus on skills required in the current job market.” ~ **Dasra Research Report on Increasing Employability in India**
- Of the 90% students enrolled in primary education in India, only 21.1% of those students enrol in higher education programs. ~ (http://www.educationforallinindia.com/educational_statistics_at_glance-MHRD_2014.pdf)

India is currently facing a huge socio-demographic challenge given that a majority of its population is in the working age with limited or no skills. As per the Labour Bureau Report 2014, the size of the skilled workforce in India is only 2%, which is extremely low when compared to countries such as China (47%), Japan (80%) and South Korea (96%). It is estimated that by around 2025, 25% of the world’s total workforce will be in India. It

has also been forecasted that the average age of India's population would be 29 in 2021 as compared to China's average age of 37, thus giving India a unique advantage of having one of the world's youngest populations. However, a large young population alone does not guarantee India an advantage. The country needs to ensure that its young workforce is equipped with the skills and knowledge required in a workplace so it can reap the "demographic dividend".

To bring about a focus on skilling and consolidate efforts, the central government has brought all the skilling programs under the ambit of a ministry created in 2014—the Ministry of Skill Development and Entrepreneurship (MSDE). The government has further stepped up its efforts through the announcement of two skill development packages worth INR 220 billion in July 2016 to improve the skills of 15 million people by 2020. While these initiatives are a step in the right direction, a few studies found that they have not yielded the expected results. Industrial Training Institutes (ITIs) constituted under the Director General of Training (DGT) have acknowledged their own shortcomings in terms of poor quality training, serious infrastructure gaps, outdated curricula, high dropout rates and minimal contact with industry. **However, a factor that is grossly ignored is failure to thrive caused due to adversity. Skills programs will have limited impact as long as we don't help young people overcome failure to thrive and catch-up to their development milestones.**

In addition, the world is changing at an exponential rate. Traditionally, an individual had one job all their life. In the 21st century, it is predicted that job seekers will have at least 8-10 jobs in their working life and we are quickly moving towards a gig economy. 65% of the jobs that young people will join have not yet been created.

Indian working population has become a mobile population only in the last 20-odd years. Earlier, one was born in one place, grew up there, got a job in the same place and lived a majority of their life in one place. This helped the large family unit stay intact. Urban development, onset of Information Technology and higher levels of exposure have changed that. There are increasing mobile populations in India that work in different cities resulting in the need for new skills to manage the complexities of being on your own and supporting your families and aging parents who live somewhere else.

With increased pressure on cities with demands of city dwellers such as infrastructure, housing, electricity, water amongst others, we are living in highly complex social environments. Increasingly, it is becoming difficult to predict what the future holds for young people. The future will bring new social, economic and environmental challenges and the next generation needs to be equipped with the agency, confidence and adaptability skills to effectively tackle them. In a fast changing, complex world – it is not the known but the ability to handle the unknown that is going to define success. For example, Bangalore has a severe shortage of fresh drinking water and could possibly run out sources of drinking water by 2025. In such a scenario, how are we and our next generation going to respond to this challenge? Are we going to fight for water as an individual resource owned by each or are we going to find a creative solution that works for everyone without prejudice or bias? Similarly, if the IT Industry in India declines, will the vast number of software engineers have the agency to unlearn, relearn and adapt to the changing environment or will they struggle to cope with the change?

Hence, as we explore the 'Future we want', OECD calls for redefining 'growth narrative' – economic growth to inclusive growth: well-being for themselves and of others. Establishing Student Agency as core to achieving the future we want where we focus on

transformative competencies such as resilience, grit, flexibility and adaptability which are critical to thrive in an unpredictable future.

The challenges are pronounced for children and young people from disadvantaged backgrounds because they not only need to overcome ACE, they also need to learn to leap frog into the future that is complex, uncertain and unpredictable. The lack of Student Agency is one of the most critical gap areas stopping young people, especially from disadvantaged backgrounds, to overcome adversity and develop the skills and capacities needed to making healthy choices and becoming productive, contributing members of society.

4. Student Agency- Its Role in helping young people Overcome Adversity

The OECD Learning Compass 2030 places student agency as an underlying key concept to achieve the ‘Future we want’ in 2030. Agency is the capacity and propensity to take purposeful initiative—the opposite of helplessness. Young people with high levels of agency do not respond passively to their circumstances; they tend to take responsibility, seek meaning and act with purpose to achieve the conditions they desire in their own and others’ lives.

It is known that for young people to overcome disadvantage and succeed in an VUCA world (of volatility, uncertainty, complexity, and ambiguity) developing Agency in a caring, safe and fun environment is one of the most critical ways to overcome ACE, achieve well-being for themselves and for society and thrive in the 21st century.

Young people who are able to adapt to this new, fast changing world by developing the transformative competencies through agency, life skills and abilities to think creatively, manage conflict, respond with empathy, work in teams, take initiative and be adaptable will thrive in this new world.

4.1. Kavitha moves towards her Learning Compass by learning to Take Responsibility, Manage Conflict and Create New Value

Kavitha (name changed) is a young person growing up in a poor community in India. At the age of 16 she had to drop out of education and seek employment because her father had suddenly abandoned the family to escape the debtors that he had defaulted. Here she was, finding that she was now the head of the family and her mother, who had only earned a meagre daily wage till then, was looking up to her to tide the family of four through this crisis. As she received mentorship and guidance, she learnt to develop the agency to deal with the crisis. Kavitha took responsibility (OECD Learning Compass 2030) by finding a part-time job while going to college in the evenings. She learnt to negotiate with the debtors and buy time. She learnt how to make a small income go a long way.

A year after the crisis, the family had come out of debt almost entirely, her father came back to the family and on the mother’s insistence was taken in, and she had strengthened

her agency, grown in her role at work and got a promotion. Life seemed good. And we wish this was the end of her challenges. Unfortunately, it is not.

Six months later, the family tried to forcefully marry her sister to an older man because he was the son of an influential politician. When she protested, all hell broke loose. The mother threatened to commit suicide. The father brought the entire extended family home to coerce the sisters. The sister finally just ran away from home, without informing Kavitha, and got married to a man she was dating. The family then decided to marry Kavitha off to the same person to save face.

Kavitha practiced her agency through this crisis by reconciling the prevalent tension and dilemma (OECD Learning Compass 2030). She did not get married to the politician's son. She did not leave home, but stood strong against her entire family. She also remarkably found the empathy to reach out to her sister and make sure she was doing well.

For Kavitha, gaining knowledge, skills and values was not just meant to help her find a job. Or get a loan. Or teach her to manage family expenses. Developing the transformative competencies (OECD 2030) helped her realize that she can handle any situation that life throws at her; that she has the courage within her to face any challenge; and that she has the resilience to bounce back from any calamity and move towards her learning compass.

Is this the end of a long journey of overcoming adversity? Of course not. because life is not like that. There is never an end to the challenges we face. And when you come from spaces of adversity, the challenges only get harder and your ability to deal with them, more compromised. Today, Kavitha is continuing to strengthen her agency and move towards her learning compass. She is creating new value (OECD Learning Compass 2030) by challenging gender norms at the workplace, is a change-maker transforming over 5,000 young lives every year through a Career Program that she runs for disadvantaged youth and she is helping young people imbibe values of empathy, equity, equality and integrity while also achieving their aspirations.

Kavitha demonstrated some of the key constructs that make up student agency which include (as defined by the OECD Learning Compass 2030) identity, purposefulness, hope, motivation, growth mind-set and positive self-orientation with continued investment to learn and change her life circumstance. For Kavitha, student agency was not only about overcoming ACE and becoming successful financially, it also meant the choices she made as a responsible human being to achieve well-being for herself and for society – investing in a sustainable life style, supporting other young people like her, being a role-model, changing gender norms in her family and workplace, unlocking empathy through her own life choices amongst others.

It is important to understand that fostering student agency works like a virtuous cycle of positive development. Student agency helped Kavitha build the transformative competencies needed to overcome ACE and at the same time be prepared for the new future in a new world. Today, Kavitha has clarity on her vision, her role in this world and the future she wants.

The question to ask is how do we develop agency in millions of young people like Kavitha that will help them overcome ACE and simultaneously move towards individual and societal well-being? How do we empower young people to move towards the 'future we want?' How do we develop agency that transforms the individual in a way that:

- It helps them to reconcile tensions and dilemmas
- It helps to create new value
- It helps them to take responsibility

4.2. Vivek, Rajesh and Vijaya Develop Transformative Competencies

He ran away from home as a child and ended up in a shelter for runaway boys. Lost, confused, lonely, low on self-esteem, Vivek got an opportunity to participate in a variety of life skills programs. He watched facilitators as they helped develop his agency and he wanted to emulate them when he grew up. When he turned 19, he chose to become a life skills facilitator. Vivek is 27 now and manages an entire After School Life Skills Program for over 5,000 young people from disadvantaged backgrounds and leads a team of 39 facilitators, many of whom were young people learning under him and he inspires them to overcome their life circumstances and lead a life of purpose. He is a trainer and also works with teachers helping them unlock creativity and empathy in their engagement with students. He lives on his own, has learnt to build a support system for himself, has a dream to impact every child in India and is deeply passionate about Football and Rugby. He mentors other young people today and inspires them to be a change-maker. Vivek demonstrates all the critical constructs around student agency that have helped him develop the transformative competencies needed to build the ‘future we want’ for himself and for his community. In the process, Vivek has overcome ACE and caught up to this development milestones.

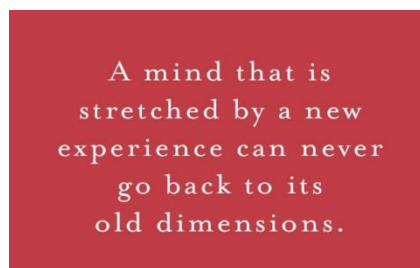
Rajesh was one of Vivek’s student and came from a poor slum in Bangalore. He fell in love with Rugby when the program was introduced in his school. He was academically doing well, enjoyed Rugby and had dreams of playing in the Indian Rugby Team. The various interventions developed his agency to tackle challenges in the future. When he joined college, both his parents were diagnosed with chronic diabetes and in a span of six months, they lost their job. Rajesh, overnight became the sole bread winner for the family, took on the family debt from his sister’s marriage and the medical needs of his parents and aging grand-parents. Rajesh had developed the agency he needed to overcome this challenge. He took responsibility (OECD Learning Compass 2030) by choosing to drop out of college, took on multiple jobs, negotiated the debt payments, sought support from his mentors and now over four years, he has cleared the majority of his debt, has a stable job where he is following a life of purpose and feels confident to thrive in this new world. He has gotten back to Rugby practice. He is creating new value (OECD Learning Compass 2030) in his community by running free rugby coaching for other children in his slum and runs outdoor experiential camps for disadvantaged youth. Rajesh says, Rugby helped me find an identity for myself, build my confidence, kept me in school, kept me away from drugs and gangs and gave me the positive self-orientation to look forward to life. I want to create the same for other children in my slum. His inspiration is his mentor, Vivek.

Vijaya comes from a life of extreme poverty and depravation. She was part of a life skills program through school that helped her catch up to her development milestones. Unfortunately, she was married at the early age of 16. A child followed quickly and her marriage ended up being abusive.

Two years later, having left her husband and with an infant child; she landed up at a career centre seeking support to rebuild her life. Her confidence and sense of self was shattered. She could not even talk and express her needs. Through a process of deep mentorship, over many months, the facilitators helped rebuild her sense of identity, her confidence and her skills to deal with dilemmas and challenges of life. It was not just about helping her find a job. More than that, it was about helping Vijaya believe that she can trust her choices and decisions again, that she has the resilience to rebuild her life and have positive self-orientation. Vijaya found her voice again, interned at the centre for a few months to learn skills for the job-market and explore her interests. She finally joined a vocational training program, topped it and found a job that gave her dignity, respect and a sense that she can take on life for herself and her child. Vijaya today dreams of a very different future for her child and has the agency to make it happen.

Each of young people above developed a set of transformative competencies as outlined in the OECD Learning Framework 2030 through sustained, committed, long-term efforts of developing student agency in them. What helped Kavitha, Vivek, Rajesh and Vijaya become more purposeful, empathetic, more creative, more self-reflective and more courageous versions of themselves and at the same time overcome ACE?

Figure 4.1.



What helped each of them have a learning compass directing them towards the future each of them want? A powerful transformative experience that fundamentally transformed their 'being'. An experience that shows you who you are capable of being, in such a powerful way, that you cannot go back to who you were.

Can such experiences be orchestrated in an education setting so that these transformations are not left to chance? Yes. By designing programs using transformative pedagogies and experiential learning approaches that focus on mastering 'student agency'. The 'Arc of Transformation' framework developed by Dream a Dream in collaboration with PYE Global is designed to develop transformative competencies for young people and teachers alike.

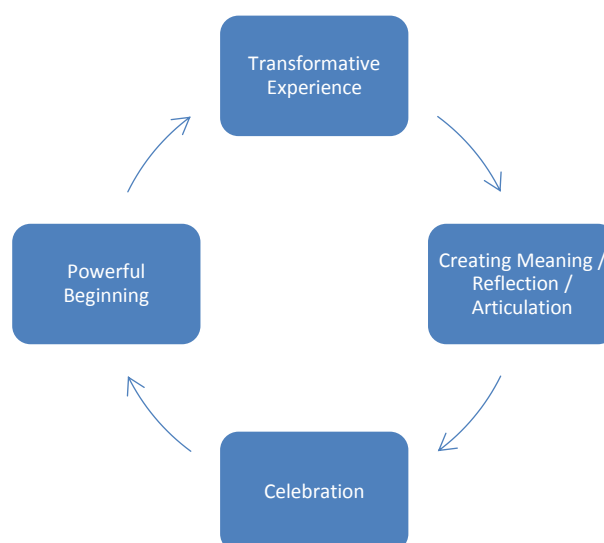
5. The 'Arc of Transformation' Framework to developing Student Agency

It is the process of holding space. It is not an activity or a group discussion. It is definitely not a toolkit or a curriculum. It is a process by which, facilitators as co-agents, hold space

for transformation. It is an ‘arc’ because once you are on the other side, there is no going back.

The process of the arc of transformation has four main components. We start by creating a powerful beginning to help us let down our guard, build trust and connect with each other. To help us trust the process. To take a low creative risk. This is followed by a high-impact powerful experience. An experience that can be created by using the arts, or sports, or any other medium that lends itself to engage in it, in a non-judgemental way. It is hopefully something that we have never done before. Something that would usually make us feel silly or inadequate. But when the experience is created in a safe and trusting environment, our true self comes to the fore. We behave as we would in real life, outside of the workshop. We listen to our inner voices. We allow ourselves to just ‘be’. We let go. The next step is to debrief or process the powerful experience. It’s about creating our own articulation of the transformation. The reflection gives us the construct for the skills we are developing – purposefulness, growth mind-set, positive self-orientation amongst others. It also gives meaning to the experience – ‘what does it mean for me’ ‘what have I learnt or discovered about myself’. Through reflection, we go deeper into who we are and what we are capable of, when we are able to see and hear ourselves beyond all the voices and images that hold us back. Finally, to make sure we never forget, to sustain the transformation, we close by celebrating the transformation and making a commitment to this new identity of ourselves.

Figure 5.1.



A sustained, long-term exposure to the ‘arc of transformation’ framework in a safe learning environment and in the presence of an empathetic adult develops student agency. It helps young people develop the transformative competencies that are needed to overcome ACE and to move towards the future we want as outlined in the OECD Learning Framework 2030.

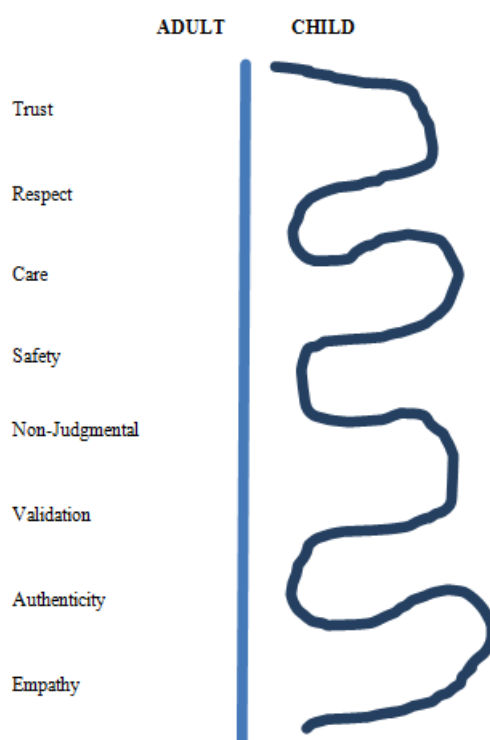
All it takes for transformation to occur is for the facilitator, as a co-agent, to bring their most authentic self to the process and a powerful experience that allows us to discover

our true self. The most important component is a facilitator/adult who holds space for the transformation through role-modelling.

6. The role of the Adult - Co-Agency

A child's growing up years are filled with anxiety. They get closer to an adult and then move away and get closer again. While the child is growing through these anxieties, a parent and/or a teacher can support the child traverse this anxiety successfully by being a rock-solid straight line in the child's life. This means that an adult is required to bring trust, respect, care, safety, validation, creativity, authenticity, empathy and a non-judgmental approach in their relationship with the child. These are also some of the key constructs of agency identified by OECD that help us achieve our well-being. Do teachers in classrooms bring this in their relationship with the student today? Not many do. Do parents demonstrate these attributes? Not many do, especially when dealing with daily survival challenges due to poverty.

Figure 6.1.



John was the oldest child of an alcoholic single mother living in a slum in Bangalore. His mother didn't have the time, resources or the capability to take care of him and his younger sister. John took to stealing early in life. He would steal small items which he would then sell to a local dealer for a few rupees. With the money so earned, he would feed himself and his sister. He loved going to school but because he always had a dirty uniform and never completed his assignments, he was beaten up and punished by his teachers. He soon dropped out of school and took to full time stealing. He was notorious in his neighbourhood. He attended a regular community center where he was treated with love, care and dignity. Where, it didn't matter that he was dirty or used to steal. This was one place where John felt safe and welcome without judgment. Not surprisingly, John never stole anything from the community center. The center attempted to put him in various progressive, alternative and residential schools but John was scarred for life and kept running away. As he entered adolescence, he became bolder and once stole an expensive bicycle. He was caught by the police and was sent to an observation home for boys in conflict with law. When 14-year old John came out of the observation home, two weeks later, he was a changed person. He had lost his childhood. He became increasingly quiet and aloof. He got back to his stealing which was the only vocation he knew to survive. He stole a scooter this time without knowing how to drive. He was killed in a road accident that night.

John's story brings into sharp focus the role of parents, teachers, peers and the larger community as co-agents in nurturing children's lives. However, do adults have the transformative competencies needed to help children develop the student agency required? Do adults understand the life altering impact of Adverse Childhood

Experiences (ACE) and how they shape values, behaviours, attitudes and mind-sets of children?

It is critical to create spaces for transformative experiences even for adults such as teachers / facilitators / principals so they can reconnect with themselves and develop the skills needed to understand, connect, respond and support children impacted by ACE. Developing Agency in teachers helps them become creative, authentic, non-judgmental, empathetic and deep listeners, who are willing to try new things, bring joy into the classroom and learn to see & hear each child.

When adults feel joyful, they bring joy to the learning spaces. When adults are not scared of failure, they help young people accept and grow from failure. When adults are creative, they help nurture creativity in young people. When adults have agency, they help young people develop agency. When adults improve their understanding of young people, develop empathy, improve their life skills and facilitation skills through their own agency, they are able to create transformative experiences for young people. Adults are a critical co-agent in the journey of growing up for each child.

Besides having general pedagogical knowledge concerning classroom management and subject matters, teachers also construct knowledge with regard to each student. By constructing student-related knowledge teachers are able to respond to the needs of each child, engage empathetically, listen well, support the child through their frustrations and dilemmas and nurture the child to catch up to their development milestones.

Recently published analyses of PISA 2015 on “Students’ Well-Being” also acknowledges the fact that schools and communities are places where students develop not only academically, but where they can also grow socially and emotionally, which can help them for life. Students who experience a greater sense of belonging at school, are in schools with a positive disciplinary climate and report receiving parental support are not only more likely to perform better academically but also to report higher levels of satisfaction with life compared to other students. (EDU EDPC (2017)16).

Here are a few examples of how a transformative and empathy based pedagogy developing co-agency can transform teachers and facilitators working with disadvantaged children.

He punished her continuously for 6 months, before asking her why she would come late to class every day. Only then did he realize that she came from a family that couldn’t afford a clock. The only reason she was late every day was because she had no way to know the time and yet everyday she tried very hard to be on time. He never punished a student after that, without first trying to understand the reason for their behaviour.

She feared being asked to do anything out of the ordinary. Every opportunity to grow at her role as a teacher was rejected, for the fear of failure. Till one day she decided to host a session on ‘Challenges faced by girls in rural communities’ for the whole school. The applause and adulation made sure she never went back to doubting herself again.

She had never thought of herself as ‘cruel’. Til it hit her one day. That her classroom was bearing the brunt of her frustrations in her personal life. Since then, she has never used her students to compensate for her anger and frustration.

She was a successful Headmistress, the President of the local school council, Manager of a series of Computer Centres, yet she never really believed in her capabilities. The voice of her father constantly telling her she was good for nothing, always played on her mind.

Till one day she discovered that she was not a child anymore and could now let go of the voice. She became surer about who she was and what she was capable of accomplishing.

The above are teachers / facilitators in schools that cater to the disadvantaged. They are adults with a responsibility to shape young minds and help them thrive. Along the way, they seem to have forgotten their own identities, their own adversities and their own stories. Education has become transactional for them stuck in administrative paperwork, standardised testing, examinations and having to complete the curriculum assigned. Investing in their co-agency helped them unlock their empathy, creativity, sense of identity and purposefulness that are required to help young people thrive.

7. Conclusion

As we move towards the ‘Future We Want’ and the vision of well-being 2030, it is imperative to acknowledge that unless we understand the impact of adversity on young people who come from disadvantaged backgrounds, we will fail in his critical mission. All our strategies will only address the symptoms at the tip of the ice-berg and not solve the core challenges faced by young people. No amount of education and skills training is going to help a young person make choices that are better for their own well-being, the environment and the well-being of entire societies, unless we can help them find their own identities and their most powerful ‘empathetic’ selves.

What we also know from experience that ‘agency’ can become a powerful tool that will help young people build the capacities to overcome their own adverse circumstances, catch-up to their development milestones and at the same time leap-frog into a future with purpose, creativity, empathy, responsibility and social consciousness. It helps young people become Change-makers like the many examples we have seen in this paper who in turn inspire a whole generation of other young people to be change-makers in their communities.

We cannot emphasize enough the role of the parent, teacher, facilitator as a co-agent helping shape young people’s values, beliefs, attitudes, behaviours and identities. An empathetic and creative teacher can be the difference between what happened to John and to Vivek. A purposeful teacher can help young people move towards their learning compass.

The metaphor of a ‘Learning Compass’ offers some insight into what is needed. While a “compass” points directions to the north, the OECD “Learning Compass” suggests direction towards the “Future We Want”. For learners, where they want to be, individually and collectively in the future, is a fundamental starting point to how they utilise their skills and knowledge. The learning compass aims to enable the learners to clarify their own vision - where they want to be, locate their current position in comparison with the future vision, and navigate with confidence the way forward. This is the best legacy we can confer on today’s learners. They will need to find solutions to economic, social and cultural challenges which our generation has yet to solve or even

recognise. We will need to work together - children, students, youth, adults, elderly – towards the same direction to make our "future we want" a reality.

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Short Comments on ‘Student Agency’

--- A Japanese View ---

Tadahiko ABIKO

Just after reading ‘Progress Report 2030 Learning Framework’, I think the content of the discussion in this report might be better than the DeSeCo’s ‘Key Competency’ 1997 as much as I can understand. In my book “Designing Instruction beyond ‘Competency-based Education’” (2014) I criticized the concept of competency-based education that emphasized competent workers too much from social and economic point of view. That did not mention students’ character like personality, individuality, morality, desire, hope, wish, choice and so on as important elements. Students seemed to be like able robots or puppets which have no life and no will. However, ‘Education 2030’ is willing to treat a student as a ‘subject’ by the term ‘Student Agency’, who has his/her own will and freedom for decision-making in his/her whole life.

In this draft I discuss several points on the concept of ‘Student Agency’ from a Japanese point of view as a non-western researcher; though I am afraid I can explain my comments or thoughts well enough.

1. Preposition

At first, I would like to mention about the preposition of discussion. I think it is too often that ‘Education 2030’ says ‘the society 2030 would be VUCA’. Even though the society 2030 might be more VUCA, but it should continue to be still a ‘society’ where we can live and work. Otherwise it would be collapsed and become turmoil. Therefore, we can discuss the society 2030 as long as it shall have some orders as a ‘society’. Then what is the important thing in a society? I agree that it must have socially and economically ‘trust’, reliance or credit even among the members of the society 2030. Whenever we discuss ‘Student Agency,’ we must remember this basic side of the society, because students as agents never lose their trust or credit in their whole social lives. I have to say ‘Student Agency’ must not forget the element of ‘trust or credit’.

2. Terminology

The term ‘Agency’ is very difficult to be translated into Japanese word. I could understand its nuance or width of meaning and connotation better by reading Mr. C. Leadbeater’s paper and Professors J. Bron & N. Nieveen’s paper. Generally speaking, the term ‘subject’ is used as an antonym of ‘object’ in epistemology. However, the term ‘subject’ does not have always a person to act or to do something. ‘Agency’ seems to have the meaning of action and representation. We can say Agency has responsibility in our work or Agency is to be a representative person in some group. Therefore, as I still cannot make this term clear in mind, I am afraid many Japanese educationists can understand it very well. Most Japanese might take it ‘child-centered’ or ‘student-centered’ in education, because such an education seems to treat a student as an Agent. .

3. Meaning

The word Agency means mainly ‘to be a spontaneous actor and a decision maker by him/herself’ who has his own ideas and value-systems independently. In 1982 Japanese sociologist Professor E. Hamaguchi of Osaka University, proposed the new theory of Japanese character as ‘Kanjin-shugi(Inter-Individualism)’ which emphasized ‘Betweenism in human relations’, i.e., relations between one person and the other more than individualism. The relation between or among persons for Japanese society is more important than opinions of individual person. Therefore, Japanese society usually does not like a person who has his own clear opinion, and it leads often to collectivism and totalitarianism. This is different from western culture of individualism, but it is original from very Japanese culture. Individual Japanese person has not been so strong and clear him/herself in mind and does not show him/herself clearly. He/she is apt to follow the atmosphere or situation related to and made from his /her groups. However, if ‘agency’ has a level of ‘collaborative’, according to Mr. Leadbeater, Japanese people can accept this concept easily, though I am afraid they accept it one-sidedly. ‘I’ in English language is used by everyone in all members of western society, but in Japanese language we have different words for ‘I’ in different situations or different social contexts, like ‘Watakusi’, ‘Boku’, ‘Ore’, ‘Shousei’, or ‘Jibun’. It depends on the relation between the two or three persons. I think this is partly influenced by the philosophy of Confucianism in Japan. Many Japanese people seem to like rather communitarianism more than individualism. They often use the word ‘we’ where we have to use ‘I’. They are reluctant to use the word ‘I’ because of impoliteness in Japanese society, in particular, in formal situation. Japanese people are always told that we must be careful of our society’s atmosphere.

4. Structure

The structure of ‘Agency’ has rather vague and complex. It is good for the Japanese that the concept of Agency is not so analytical but very holistic and holistic approach is mainly familiar to the Eastern Asia. In ‘Education 2030’ project shows three transformative competencies of Creating new value, Taking responsibility, and Reconciling tensions and dilemmas which are all composed of ‘Knowledge’, ‘Skills’, and ‘Attitudes and values’. Agency shall be focused on intentional and emotional activity in all kinds of mental work. However, in Japanese pedagogy the aims of schooling is roughly divided into Ability raising or improving and Character cultivation, because Japanese pedagogy has consisted of two domains of ‘Bildung’ and ‘Erziehung’ from German theory since the beginning of Meiji Era, 1972, or of three traditional domains of Ti-iku (Intellectual education), Toku-iku (Moral education), and Tai-iku (Physical education) of which the last one is sometimes omitted. And in Japanese tradition the latter should be prior to the former and the latter includes the former as its part, though these two have been sometimes explained as a pair of wheels of a car. The reason is that Character is the whole and Abilities are its part. Western psychologists recently stress the distinction between cognitive and non-cognitive, which is, I think, too formal or superficial; these two are different in educational position. Character gives a direction or an aim of learning, and abilities work as means or tools to reach the goal and achieve the objectives. In addition, from the result of brain research cognitive abilities function respectively and analytically as well as synthetically, while emotions work and influence very often to the whole person or to all the functions of brain, in according to Mr. D. Gorman’s book ‘Emotional Intelligence ’(1995) which, like this ‘Education 2030’, emphasized the functions of emotion as Emotion Quotient (EQ). I would say ‘Education 2030’ should show its model that the ‘emotional’ (level) includes the other two, cognitive (level) and practical use (level). Surely emotions influence the other two in appropriate direction or in inappropriate direction. Therefore, from both western and Japanese point of view, competencies in the two levels should be included in ‘emotional function’ or ‘Emotional Intelligence’ in broad sense, though most Japanese people still wonder whether ‘emotion’ can include morality and value judgment or not, because the Japanese usually connect ‘emotion’ to anger, fear, sorrow, etc., working beyond morality or reasonable judgments in negative way.

Furthermore I would like to say Character cultivation is the last goal or end of ‘Education’ while improvement of ability achievement is to be a process or a part of the ‘Education’. And character education must aim at ‘independence’ (including ‘interdependence’ partly) from the older generation and the society. ‘Education as a fact’, not ‘education as a western idea’, has been to attain ‘independence’ historically and biologically since anthropologists found ‘initiation’ in primitive life of human beings. ‘Agency’ has to mean mainly ‘independence’ as the first and indispensable element from this point of view. This is not contradictory to trust or reliance because independence of the individual needs responsibility and confidence, and the Japanese Betweenism should be overcome in the global society.

5. Functions or Characteristics

From the traditional perspective of Japanese education ‘Student Agency’ must have a good balance among three divisions of education, ‘Chi-iku’, , ‘Toku-iku’, and ‘Tai-iku’, as I noted before. Japanese people are eager to make a good balance among them in educating their younger generation everywhere. I know Japanese schooling has had a very good reputation also in moral education in many international researches. When I found the Westerners discuss good morality is very helpful to make children concentrate in their learning, I was surprised at such a connection between morality and learning. Though I can understand that, I think Japanese people are purely eager to discipline their children in morality. But such a side-effect could be not ignored. Therefore, Japanese teachers are too busy to do their heavy duties in every division of education even in school.

As I mentioned above, even if ‘Agency’ is stressed, I cannot agree the idea that it is unnecessary for ‘Agency’ to master basic skills and senses because of the importance of problem solving abilities. Till around the age of 10 basic literal and numerical skills have to be mastered enough, because after around that age children have to use those skills accurately to solve many kinds of problems in various academic fields. Among Japanese teachers’ experiences, also from recent brain research and Professor D. J. Hernandez’s research (Sociologist, City University of New York) titled ‘Double Jeopardy’ (2011), we can find, after around the 3rd or 4th grade in school, the reading skills has a crucial role as a tool to study further, and for children these skills are essential in order to graduate their high schools successfully. I would like to think ‘Agency’ from the viewpoint of psychological and physiological development. Japanese people believe what their children should master completely, e.g., Three ‘Rs’ (reading skills, writing skills, and arithmetic skills) must be mastered completely. In this part of education Japanese people don’t want to compromise with their children. From this viewpoint ‘Agency’ needs to have ‘patience’ or ‘resilience’ not only in problem solving activities but also in repetition or exercise during children’s learning. We surely have to make ‘repetition and exercise’ in learning happy and pleasant.

‘Agency’ may possess not only purpose but ‘spontaneity’ or challenging and voluntary mind in its activities. As much as agency has purpose, agency has responsibility too. But I am sure that agency’s purpose might be often given as a social task which follows its responsibility. However, I think ‘Agency’ should have freedom to choose and solve something for itself. Free will and inner motives of ‘Agency’ should be not disregarded.

6. Additional comments on Student Agency

I thought and learned a lot about the concept of ‘Agency’ from Mr. Leadbeater’s paper. As his analytical and structural model on Student Agency was very helpful, I could

understand better the whole image of ‘Agency’ and ‘Agent’. Then I would like to add some discussions more.

Firstly, I am very interested in the aspect of ‘political agency’. From my point of view, so far the PISA has been accepted in every type of political systems like democracy, monarchy, socialism, etc. This is, I think, because the PISA is mainly focused on economic concern. In my opinion, however, political agency is the most important because it can include the meaning that students are the ‘Sovereign (persons) in the future and of the future’. In general, I wonder whether the concept ‘Agent’ can neglect ‘political’ role or not. This question is related to the curriculum development.

Secondly, I cannot understand ‘Co-agency’ includes teachers and parents. I think teachers and parents are in different dimensions. ‘Agency’ should be used only in Student.

In Japan, teachers and parents are sometimes to be opposed to their students, because in reality they often want to force students to become obedient like a robot or a puppet.

It is not ‘education’ but ‘indoctrination’. Therefore, we must construct the concept ‘Co-agency’ carefully, though I agree this concept would be very important in ideal level.

Thirdly, what is the position of ‘society’ or ‘environment’? ‘Agency’ should have always some interactions with society or environment, and then we have to mention its relations to ‘Student Agency’. I think what kind of society we want, ‘Learning Compass’, would be the most critical point. It would make us unhappy if the society cannot be controlled by us, because it cannot be clear that the society has automatically both its well-being and individual well-being within. Our present or future society might be such a monster. I remember Late Professor of Cornell University Dr. C. E. Sagan’s word ‘It is tragedy that Intelligence to develop has been beyond the Intelligence to control’. Our society in future should be to be controlled as an object, not to be developed for itself as a subject.

Student Agency in Asia: Educators' Perceptions on Its Promises and Barriers

Namji STEINEMANN (East-West Center)

Education reform initiatives often go back and forth with “new labels,” but the key questions remain the same: How can we better prepare youth for their future? What skills and competencies will they need for effective, meaningful, and responsible participation in the world of tomorrow, and how can we best cultivate those skills? The difference today is the unprecedented pace and intensity of change, propelled by technological advances and global interconnectivity, that is reshaping societies. In the McKinsey global trends report 2015, the rate of change taking place now far outpaces that of the Industrial Revolution. The report estimates that change is “happening ten times faster and at 300 times the scale, or roughly 3,000 times the impact.”

¹ As a result, the question of how to prepare youth to adapt and thrive in this new world takes on even greater urgency.

What the future will look like has significant implications for teaching and learning. Education policymakers in countries across world regions are reforming their curricula to focus on “21st-century learning skills.” They are adopting pedagogical approaches for fostering critical thinking and problem-solving skills, creativity and innovation, and collaboration and communication across cultures. In recent years, a growing consensus has also emerged among policymakers and other critical stakeholders in education that giving students “agency” to shape or influence their own learning is key to preparing young people to thrive in the decades ahead. With its project “Future of Education and Skills: Education 2030,” OECD is developing a conceptual learning framework built around the concept of “student agency.” The organization is reimagining what “deep learning” in the 21st century can be and how to best make that learning happen in the classroom and beyond.

Taking to heart OECD’s declaration that this learning framework will be “an output and a co-creation of global collective effort,” I shared the framework with a number of educators I work closely with in schools across Asia. Given that this region of great diversity is where more than half of the world’s 1.2 billion adolescents aged 10-19 years live,² I sought their “take” on the “practicality of the framework” in the context of their own classroom/school/curricular realities. Building on that initial informal inquiry, for this paper I reached out to a small group of educators in five Asian countries (OECD member country Japan; key OECD partner countries China and Indonesia; and Myanmar

¹ Richard Dobbs, James Manyika, and Jonathan Woetzel, “The Four Global Forces Breaking All the Trends (Book Excerpt, McKinsey Global Institute, 2015) <https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/the-four-global-forces-breaking-all-the-trends>.

² UNICEF Data: Adolescents Demographics (2017), <https://data.unicef.org/topic/adolescents/adolescent-demographics/>.

and the Philippines, member states of the Association of Southeast Asian Nations/ASEAN, a strategic regional partner of OECD) to get a sense of how teachers in these countries understand the concept of “student agency” when viewed through their “non-Western” cultural lenses and the differing material conditions of their schools.

Even as the idea of student-directed learning seems universally appealing and effective, since in some educational discourse it has been argued that the concept of “student agency” promotes a cognitive style more consistent with that of Euro-American cultural groups, a small sampling of non-Western perspectives shared here will, I hope, offer valuable insights that further our discussions on ways to give more consideration to the cultural values, attitudes, and social norms that influence teaching and learning.

I would be remiss if I did not make it clear that this paper does not represent a research paper in any shape or form. Rather, it summarizes findings from a very informal survey of a small number of teachers in five countries (three per country) who, in turn, sought input from their peers. All of the primary contacts are those affiliated with programs offered by the East-West Center, the non-profit education and research organization based in Hawai‘i whose mission is to promote better relations and understanding among the people and nations of the United States, Asia, and the Pacific through cooperative study, research, and dialogue.

1. Redefining the Concept of Student Agency in Local Contexts?

With the exception of two teachers (one from an elementary school in China and the other a lower secondary school teacher in Indonesia), all other teachers who contributed their thoughts to this paper said they were familiar with the concept of “student agency.” However, some said that the terminology was confusing for many of their peers, for they could not find an equivalent translation in their local language(s).

Japanese teachers tended to equate the concept of agency to that of “student-centred” learning. One teacher suggested “independent learners,” although she thought most parents and students would perceive this concept in relation to student union, club, or classroom leadership roles, and not as it relates to learning. Some thought “active learning” might help Japanese teachers understand the concept, as it describes the “desired ways” for students to learn.

Indonesian teachers, too, thought the concept of student agency was closely related to the “active learning” approach, called Cara Belajar Siswa Aktif (popularly known by its acronym CBSA), which was promoted by the Indonesian government in the early 1980s, although the “reality of implementation did not meet the goals of the policy.” The other concept cited was “independent learners.” And, as with the Japanese teachers, they referenced “student-centred learning” as a way for them to activate student agency.

Filipino teachers seemed confident that their peers would understand the concept “as long as they have not locked themselves in traditional classes,” as one teacher put it. However, they talked about student agency as an outcome fostered through “student-centred” approaches to teaching/learning.

Chinese teachers thought the concept of student agency would be easily understood by their peers, and one teacher was especially enthusiastic in his belief that the concept can be appropriately and easily translated into Chinese, given that the “great Chinese educator Confucius had many educational principles very similar to the concept of student agency, from over two thousand years ago.”

An interesting suggestion from one teacher was to revise the concept as “Student-Teacher-Parent Interactive Agency” for it to be more readily adopted/embraced. The reason he provided is that the purpose of education in China is multiple and concerns the individual in the context of the larger society and the family. Hence, a student pursues lifelong learning capacities in order to score high on exams to enter ideal universities, become a qualified citizen of the country as well as a qualified worker in society, and, importantly, a qualified member of the family. As such, this teacher felt that a concept that promotes positive interaction and collaboration among students, teachers, and parents would be more readily accepted than a student-driven pedagogy.

For my colleagues in Myanmar, since the word “agent” is an adopted English word in Myanmar language to mean a “broker,” such as when referring to a “travel agent,” they thought the terminology itself might not be readily understood in the context of education. They thought their peers would better understand the concept using terms like “learner-centered” approaches, which have been introduced by UNICEF, and that such topics are widely discussed in teacher training programs throughout Myanmar. Another concept that was suggested was “change agents,” which many NGOs have introduced to foster social change in the context of community development. However, they admitted that most teachers in Myanmar, themselves included, do not clearly understand the practical side of how the concept of student agency is applied in their day-to-day teaching.

In short, even as my Asian teacher-colleagues were confident in expressing their own understanding of as well as appreciation for the concept of student agency, the examples they used to articulate their understanding seem to point to ideas that are still rooted in teacher-initiated approaches. Therefore, rather than relying on translating “student agency” into local languages, which may or may not succeed in conveying the full scope of meaning/ideals/values inherent in the concept, providing more concrete descriptions and examples of how students empowered with “agency” approach their learning in class X or class Y, and how their teachers interact with them, may be more impactful.

2. Culture-Practice Tensions

Schools in Japan and China take pride in having high-achieving students. For example, these two nations consistently outperform many of their global counterparts on the Program for International Student Assessment (PISA), a triennial international survey designed by OECD to evaluate education systems worldwide by testing skills and knowledge of 15-year-old students. However, it is often said that while these countries excel at test taking, their education systems value students who are textbook-focused, hardworking, and compliant, while undervaluing those who are inquisitive, creative, and

adept at critical thinking. How does “student agency” fit into systems that achieve strong test results despite a seeming lack of emphasis on student-centred approaches?

As the Japanese teachers noted, people value “conformity and harmony” in both school and social contexts in Japan, and therefore, “one should not/cannot be too creative, stand out, or be too individualistic,” which implied that they saw the latter as characteristics promoted through student agency. The popular Japanese saying, “the nail that sticks out gets hammered down,” was cited as the reason why most Japanese students and citizens do not want to stand out.

However, even as they thought the goals of student agency may challenge Japan’s cultural/social norms, they expressed hope that Japanese society is changing and that more and more people are “waking up” to the realization that promoting “creativity” through student agency is necessary for the future generation.

Teachers from Myanmar noted how a “good and clever student in the traditional definition is to be quiet and memorize what is given, as well as getting high marks on exams.” As one teacher noted, since “teachers were traditionally regarded as equal to Buddha, we pray to teachers.” And, since “being silent and listening to what the teacher says is regarded as the polite way of being a student,” most students will find it hard to raise questions that might be seen as challenging the teachers’ authority. Some teachers might even find it insulting for students to “ask too many questions about the content provided by the teacher.”

The Filipino teachers (all from Cebu, I should note) cited how their schools promote values of being effective communicators, critical thinkers, and open-minded and caring individuals who act with integrity. They felt the values inherent in the concept of student agency were very much aligned to the personal qualities and attitudes that students are encouraged to develop/uphold.

Indonesian teachers, two of them also affiliated with Islamic boarding schools, offered conflicting views. On the one hand, they were eager to point out that they did not feel the values reflected in the concept of student agency challenged those values important in Indonesian society or in Muslim Indonesia. One teacher even pointed out that “Indonesian schools are different from schools in the Middle East.” At the same time, they noted that elementary and middle-school students, in particular, are “not allowed to express, speak up, or do as they want,” as young children are more “bound” by traditional cultural values and social norms. Children are expected to be obedient to elders, teachers, and other authority figures, with teachers being regarded as the “source of knowledge and learning.” Islamic boarding school educators found much to like in the goals espoused by “student agency,” for they see themselves as grooming future leaders who can “jump into society” to respond to challenges in their communities.

Chinese teachers noted how the ideals and values of “student agency” are admired by the Chinese educational authorities and that the concept as well as its values are not “culturally alien” to Chinese educators, students, and parents. They say they are actively promoted in society and schools, though they thought the situations would be different in rural schools/communities. However, given that these teachers were not from rural communities, they were unable to speak with any sense of authority based on experience or knowledge.

All cited the need for change in accepting new ways of knowing, thinking, and being, and all expressed a sense of hope that change was possible as well as necessary for the new generation.

3. Barriers to Change

All of the teachers in this study embraced the ideals espoused by the concept of student agency, and many noted that their governments were promoting teaching/learning approaches that complement student agency goals. However, none felt that they had the practical know-how to design effective learning experiences to foster student agency.

They also thought that a great many of their peers would find it difficult to shift from the traditional teacher-led approach, which is still prevalent in their schools (not to mention in schools throughout the world), to an approach where each student directs his/her own learning. Many spoke of formidable barriers to change that are deeply rooted in their education systems, even as concepts like student agency and 21st-century learning are embraced by policymakers at the highest levels.

For example, educational policymakers in ASEAN countries, including Indonesia, Myanmar, and the Philippines, are in the process of reshaping their education systems to reflect the region's dynamic economies and growth trajectories. They have developed a common "One Vision" aspiration that influences their educational goals and desired outcomes. Home to 630 million, including a large, multi-lingual youth population, ASEAN and the region's education policymakers have generally embraced the concept of "student agency." But their teachers don't feel they have the agency themselves to implement change due to, among other things, curriculum constraints, the training they and their peers received, and their unfamiliarity with new methods and instructional interventions to promote student agency, as well as other pressures such as curriculum overload.

Indonesian teachers shared their frustrations with reform initiatives that keep changing all the time. They noted that while teachers are still trying out the main concepts of the latest curriculum, a new curriculum is introduced, which implies that the previous one is no longer good and should be abandoned. Then, as teachers switch to learning the main concepts of this new curriculum, another one is introduced, and it goes on and on. This causes "reform-fatigue," where teachers become so tired that they lose interest in learning and adopting reform ideas.

All cited exams, including national and/or university/college entrance exams, as one of the biggest barriers to change, even as many teachers and schools want to "try something new in order to make students learn actively," one teacher lamented. They spoke of how exams "force" the use of memorization and direct methods of teaching, with students trained as "parrots" and being good at producing answers that teachers want. In this exam-driven environment, there was "no place, time, or need" for developing critical thinking, analytical, or creative thinking skills. Even as they eschewed having to "teach to the test," all spoke, in one way or another, of their sense of "obligation" to their students and to their schools to make sure that their students "pass the exams."

Chinese teachers spoke of intense competition among students, as well as among school staff to ensure that their students get high scores and admissions to top Chinese universities. As such, this admissions mania makes any student-driven pedagogy more difficult to implement in Chinese classrooms.

All of the teachers spoke in varying ways about their lack of a real sense of autonomy, in large part because of exam pressures. In Myanmar, for example, it was noted that teachers

in government schools “don't really have autonomy in what they teach and sometimes even in how they teach.” They have to use the government textbooks, with monthly exams and tests forcing the use of memorization and direct methods of teaching.

Indonesian teachers spoke of their roles as “civil servants,” who are assessed and rewarded in their careers by the same measures as other government employees, and how this affects their mentality as teachers. As one teacher noted, when introduced to the idea of student agency, most teachers will learn and implement it as long as it is part of the instructions from their superiors. They do not really think about its benefits for students and for learning itself. As a result, their learning about new ideas such as student agency is more superficial than substantial.

Still, many spoke optimistically about the goals for student agency as being important, even if they have a long way to go to fulfil them. In Myanmar, for example, out of four different types of schools (public, private, international, and monastic), only international schools are more actively working to foster student agency, although some private schools and monastic schools are also trying as they have better control over the classroom size and delivery. On the other hand, public schools apparently face tremendous challenges with class size, where students-per-teacher ratios are sometimes as high as 80:1.

That being said, one teacher noted that while it's easier to feel despair at the future of Myanmar education and, in turn, the future of the country, she cited the following reasons for her great hope. The new government has publicly announced that education is one of the priorities of the nation and has increased the budget for education and pledged to hire 100,000 public school teachers. In addition, the international aid agencies JICA and ADB are developing new student-centred curriculum for primary and middle-school textbooks, and new teacher competency standards for 21st-century classrooms, drafted by UNESCO, have been adopted by the government along with recommendations for teachers' continuous professional development. As well, new private school laws have allowed more schools to open for middle and upper-middle income families, who are enrolling their children in better-equipped schools. Moreover, teachers in monastic, private, and international schools have autonomy over extracurricular programs in terms of textbooks, activities, teaching methodology, classroom size, and types of exams. Importantly, private sector educators, entrepreneurs, and innovators are also realizing and acknowledging that education shouldn't be government's responsibility alone.

4. What More Is Needed

Most look to their governments to craft policies that will not just mandate student agency as a goal, but will also bring about what they see as much-needed change in what schools are required to teach and especially in how students are assessed in their mastery of learning. Japanese teachers sounded more hopeful than others about the possibility of “real reform,” and cited their government's efforts to date and more changes (for the better) that were expected

All agreed that what's needed is an investment in capacity building through changes in pre-service teacher preparation programs, as well as ongoing professional development of teachers in order to empower them with their own agency and give them the tools to cultivate student agency in their classrooms and schools.

They cited the need for more reform-minded leaders both inside and outside the system who are committed to long-term reform, given that learning new and complex ideas is never easy and takes a lot of time.

They also thought a combination of top-down and bottom-up implementation strategies would help push student agency goals forward. As one Indonesian teacher noted, "We cannot deny that Indonesian society is still very much a paternalistic one. The influence of leaders is huge in making things happen."

Given the diversity of viewpoints and experiences, I will close with these still lingering questions for further discussion and elaboration: How do we find a more "universal" way to illustrate what we mean by "student agency"? Given the local realities of individual schools and their material circumstances, how can student agency be promoted in ways that ensure equity, access, and opportunities for all students, not just the privileged few? Importantly, how do we reduce the achievement gap between elite and struggling students, which is found in all countries and all schools, and how do we weigh the role that economics plays in creating that gap?

Student Agency

Charles Leadbeater

1. Students as Agents of Change

The big achievement in education over the last two decades is that so many more children are going to school, especially in the developing world. Yet too little of what young people do in school prepares them to tackle the challenges they face in life. They are in school but learning too little. Even when young people emerge with good test scores, from high performing education systems, they may be ill-prepared for the uncertainties of the real world.

In a more volatile, uncertain world, increasingly driven by innovation and entrepreneurship, we need to equip young people to make their own way in the world to exploit the application of emerging technologies. They need to learn how to prosper without doing the routine tasks that robots will excel at. They need to be adept at sensing opportunity, forming their own goals, taking risks and making investments, learning how to collaborate with others to solve complex problems which defy easy categorisation.

Young people face a world that is more exponential, fragile, connected and unpredictable. To serve them well education needs a new sense of what it means to be well educated.

This paper argues that student agency should provide that renewed sense purpose.

Students should emerge from education as purposeful, reflective responsible agents, investing themselves actively to achieve goals which they have understood and endorsed.

The idea of student agency lies at the heart of the OECD’s 2030 Framework and of the DeSeCo framework from which it grew. A paper presented to the special symposium organised alongside the OECD IFWG meeting in Beijing in November said education should be “equipping people to shape the future for the better.”

The E2030 paper – Conceptual Framework: Key Competencies for 2030 (DeSeCo 2.0) remarks: “Knowledge and skills, attitudes and values form a complex, interrelated system resulting in a person taking action.” It goes on: “Defending and asserting ones rights, interest, limits and needs (one of the key competencies put forward in the DeSeCo framework) lies at the very heart of **responsible, autonomous action**. It means that individuals capably put themselves forward as a subject, of whom account has to be

taken, and adeptly assume their responsibilities and choices as a citizen, family member, consumer and worker in a world of different cultures, interests, values and beliefs.”

Too much schooling does not develop these capabilities for responsible, autonomous and collaborative action. Too few students understand and endorse the goals of education which increasingly seem to be set by standardised test scores. Too many students feel school is demoralising and demotivating. They are physically present in school but too often psychologically absent. They learn to do what is required to pass the test but dutiful diligence is not the same as robust, reflective resilience.

Yet to develop students who are rounded, capable agents it is not enough for students merely to be active rather than passive. Chaotic, ill-structured activity with no sense of purpose, uninformed by knowledge of theory and practice, is neither good for learning nor for a sense of agency.

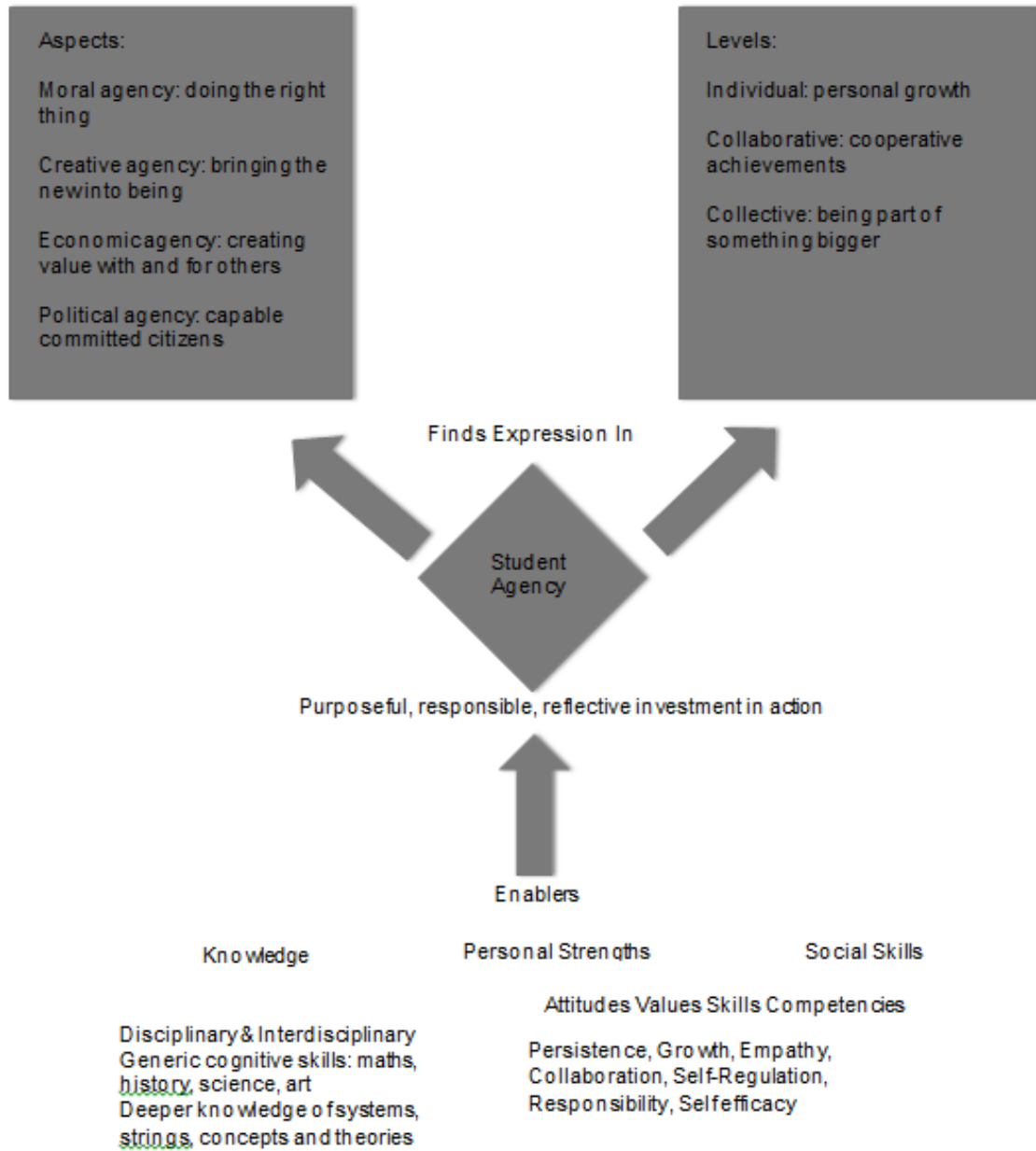
Nor is it enough for students simply to make choices between different alternatives, as if they were consumers. Student agency is not the same as child-centred, education in which children choose what they want to do and a thousand flowers bloom (or wilt.) That version of personalised learning is relatively shallow. Deeper forms of personalised learning are more demanding because they require students not just to make choices but to make investments in pursuing their own goals.

Acting, being a capable agent, means casting yourself into a future which is necessarily uncertain and so involves taking risks. Action is the bridge between the past – what you know and where you start from – and what you want to bring into being. We need more students capable of responsible, purposeful, well-informed action, together.

Most of the elements of the OECD 2030 Learning Compass can be incorporated within the student agency model set out below.

Figure 1.1.

The Student Agency Model



2. The Roots of Agency

Student agency is already a central part to the OECD's E2030 work. The idea that learning should lead to thoughtful action is. Andreas Schleicher, Director for Education and Skills at the OECD and the architect of the influential Programme for International Student Assessment (PISA), which ranks education systems' performance argues that: "The world no longer rewards people just for what they know – search engines know everything – **but for what they can do** with what they know, how they behave in the world, and how they adapt. Because that is the main differentiator today, education is becoming more about creativity, critical thinking, communication and collaboration."

Yet despite this endorsement of the idea, student agency remains somewhat submerged beneath the wider framework of knowledge, attitudes and values, skills and competences. This paper suggests redrawing many of these frameworks by putting a rounded (integrated and holistic) ideal of student agency at the very heart of the framework.

This would build on the original insights of the influential DeSeCo programme conducted by the OECD between 1996 and 2003, in which acting autonomously was one of three groups of critical competencies along with interacting with socially heterogeneous groups and using tools interactively.

DeSeCo argued for an integrated and holistic view of agency. Gonczi in his contribution to the DeSeCo project pointed out that most educational thinking in the West arrives on a straight line from the ancient Greeks, via the enlightenment, heavily laden with dichotomies which divide the mental and the manual, theoretical versus practical, mind versus body. Gonczi and Weinert argue for a more relational, integrated and holistic approach to competence, which link the attitudes of the individual (knowledge, cognitive, practice and socio-emotional skills, attitudes and values) to the demands and challenges which individuals encounter in the context of work and life.

This underpins the **action competence model** which "combines knowledge and cognitive and non-cognitive components that together represent a complex control system and *result in a person taking action.*" This implies the point and the crucial test of the wide range of competences, attitudes and knowledge that young people acquire should be the quality of the action they take. Everything leads to agency.

Unesco makes a similar point in connection to the idea of global citizenship: "The knowledge, skills, values and attitudes that learners need to build a more just, peaceful and sustainable world and to thrive as global citizens in the twenty first century." Knowledge, skills, values and attitudes should lead to *building*: a concrete action in the real world.

A Draft Discussion Paper on the progress in developing the OECD Learning Framework 2030 says that in a time of individual empowerment it is becoming increasingly important that today's students be empowered to navigate in social space and time to manage their lives in meaningful and responsible ways by *influencing* their living and working conditions. It goes on: "It is about acting rather than to be acted upon, shaping rather than to be shaped and choosing rather than to accept choices decided by others."

Acting and operating effectively, in and on the world does not mean functioning in social isolation, nor does it mean acting solely out of self-interest. It requires an orientation toward the future, a meaningful life plan, and an awareness of one's environment.

“It assumes the possession of a sound self-concept and the ability to translate, in a responsible way, needs and wants into acts of will: decision, choice, action.”

Deeper Roots

These ideas are framed as a practical response to the changing environment young people face. But the links between knowledge and action, identity and reflection have deep philosophical roots. Efforts to develop education to promote student agency will be more successful if these roots are explored fully. The idea of students as agents raises all sorts of deeper questions about how people make choices, develop capabilities, work with others to achieve common goals. In many Western cultures the idea of students as agents is linked to a view of the world in which the knowing subject confronts a separate objective world which needs to be probed, questioned and manipulated. However this is only one view. There are a rich variety of alternative philosophical traditions, both Eastern and Western, in which there is no sharp line between subject and object; they define one another. In some non-Western cultures which have deeply communitarian roots, Japan is an example, the whole idea of the individual as agent is problematic. Japanese culture stresses the importance of decision making through consensus which maintains an intricate social balance.

One vital source of these ideas is John Dewey’s advocacy of education as a form of structured experience.

The ideal education, for Dewey, is for students to develop a powerful sense of self-control, one that is ordered by intelligence and purpose. Freedom and so agency is the power to frame your actions with a purpose and to devise and execute a plan to achieve that purpose. Finding that purpose is thus a vital part of education. Purpose is not just an impulse or a desire; it has to translate into a realistic plan of action based on foresight and observation. Dewey is critical of action for its own sake which means freedom is simply a response to impulses. Dewey argues that intelligent, reflective activity is the basis for freedom.

Similar themes run through the work of Brazilian pedagogue Paulo Freire, who argued that education should equip students with a critical consciousness of the world and how to make a difference to the world that counts. Freire’s approach has a particular relevance to the role that agency can play for children who come from disadvantaged communities. He argued that learning should be a participative, interactive and dialogic process leading to a dynamic combination of reflection and action. Reflection is vital to ensure action is intelligently and thoughtfully directed. Only then would people learn to become “beings for themselves” Freire argued. Reflective action involves both careful observation of the world and an understanding of theory but also reflection on the problems and challenges that learners want to address. Education should be organised around a process of “problem-posing”, an education of “I wonder” rather than simply “I do.” For Freire, as with Dewey, action requires purpose, reflection and dialogue because it takes place in a social setting and invariably requires cooperation to succeed. Action without reflection is chaotic activism for its own sake. Reflection and theory without action is all talk. Individuals only ever take effective action in a social setting. Agency is invariably co-agency.

One contemporary development of these ideas is the capabilities approach to human development and the capacity for freedom. The capabilities approach is associated with the work of development economist Amartya Sen and moral philosopher Martha Nussbaum.

The capability approach focuses on what people need in order to live lives that they value. That is not just a question of income, consumption, happiness and utility. The capability to live a good life is defined by a set of “beings and doings” like being in good health, being able to move around freely and to affiliate with other people.

Sen’s approach emerged from his work as a development economist and his criticism of overly narrow, mechanistic and utilitarian accounts of development focussed on measures such as individual income and GDP. It is not enough for people to have incomes, goods and rights, Sen argued, they need the capabilities to turn these ingredients into a life worth living. It is not enough to have commodity like a bike, what matters is whether people can bicycle, and bicycling is probably less important than whether people are in good health and move around safely. Sen’s distinction between commodities and capabilities can also apply to education. It is not enough to have qualifications which are akin to commodities to be traded in the jobs market. What matters is what you can do with those qualifications and what you can be. Capabilities to read and write are vital to the development of other capabilities to reason, sense, think and imagine.

Sen’s capability framework has been widely applied to issues of social justice and inequality, also central concerns for education systems. The best known version of this developed by the moral philosopher Martha Nussbaum argues that human dignity depends on being able to develop capabilities central to living a decent life. The goal of social justice should be to ensure a fair and equitable distribution of these capabilities (and the resources, incomes and commodities that make them possible.) A just society, Nussbaum argues, would guarantee through its constitution and its education system access to these core capabilities which include physical health, the ability to move around freely, to affiliate with other people, to play, to become attached to, love and care for other people.

None of these approaches goes without criticism. Nussbaum in particular has been criticised for proposing a lengthy and culturally biased set of capabilities, which includes for instance the capacity to enjoy classical music. Yet capability theory has interesting implications for education. Education should be providing not just credentials but developing a wider, deeper set of capabilities for people to live well; a set of “beings and doings” rather than a list of exam grades.

These approaches to education as the development of a rounded sense of agency, to live life well, are reflected in three more recent and influential contributions to debate over education which touch on agency.

Angela Duckworth, in her book *Grit*, provides an account of how students succeed in a wide range of fields through a process of determined, reflective and purposeful practice. Successful athletes, chess players and students seek out feedback in action, reflect on what they have been told and then respond to it methodically to improve their performance. The most successful people in many fields engage in “deliberate practice.” They do not give up when they get negative feedback but nor do they plough on unthinkingly. They reflect, create a plan, deliberately practice to improve their performance and they try again. *Grit* is an account of how students become deliberate agents, setting out to identify goals, understand problems, make plans to improve and learn in action.

Resilience is both a personal, individual capability and a feature of teams and communities. The best way to become a better swimmer, Duckworth argues, is to be part of a very good swimming club which will raise your ambitions and standards and support

you while you improve. Capabilities are both personal and social; people become more effective agents together, when they are supporting, encouraging and challenging one another. We become agents, find our identity and purpose in and through the relationships we have with others.

Carol Dweck's work on the "growth-mind-set" complements Duckworth's. A mind-set is an implicit theory about the world and your role in it. Dweck distinguishes between people with a fixed and a growth mind-set. People with a fixed mind-set believe their talents and intelligence are already fixed and so too is their capacity to learn. They tend to consolidate what they already know and what they are already good at rather than developing new capabilities. Students with a growth mind-set however see their own capabilities as open to development. They are much more open to the world, to possibilities and ambiguity. Their belief that they are agents who can learn, through dedication and hard work, is fundamental to their capacity to learn. Learning is the basis for agency but a belief in one's agency – the capacity to learn - is fundamental to learning. Learning and agency have a circular, reinforcing relationship. Building up student's self-belief in their capacity to be agents of learning makes them more likely to learn.

Finally, Ron Berger, the inspiration for the expeditionary learning movement and many schools which use project based learning, provides an account of the importance of craft work to learning. In *The Ethic of Excellence* his account of his practice as a school principal, Berger argues that learning should be seen as form of craft. Children should go to school to craft great work. That requires them to work with the materials at hand; to attend to what they are doing; to learn from feedback in a process of drafting and redrafting to improve their work; to respect the skills of people they can learn from. That requires patience, resilience and persistence. Doing good work is one of the most important settings for personal growth, in our becoming who we want to be. The implication of Berger's work is that education should be a profound experience of developing agency through good work.

These diverse contributions from economists, philosophers, psychologists and educators, point to a set of common themes that education should be organised around if it is to develop young people as capable agents.

- They should be able to develop a sense of **purpose**, posing problems, setting goals, framing what they understand as living well.
- Through intelligent and planned **action** they need to learn how to take initiatives in the real world to achieve their goals.
- To understand their goals and how to achieve them action has to be **reflective** to learn from feedback, to apply theory and incorporate deliberate practice to improve.
- Capable agents should have a sense of **responsibility** for their actions, including an ethical sense of acting in the right way, in relation to other people.
- This is a deeply **personal** undertaking but also an essentially **social** one: it involves dialogue, discussion and feedback, both to frame shared goals and intentions and to cooperate to achieve them. Agency is invariably co-agency: individuals cooperating to achieve shared goals.
- All of this depends on the development, application and combination of different kinds of **knowledge** both practical and theoretical, explicit and tacit.

Education needs to develop both cognitive and non-cognitive strengths, such as resilience and collaboration, because without them young people will lack the capabilities they need to be agents, to make a difference to their world, to find ways to live well. They may have knowledge, intelligence and good grades but they may well be inert, like a bicycle with no one who can ride it. Developing learners capable of reflective, purposeful action in the real world will require dynamic forms of learning which combine the development of knowledge as well as personal and social skills.

That idea is already central to the work of the OECD on the future of learning, starting with DeSeCo and continuing through the E2030 Framework. However there are several ways in which this idea could and should be developed.

The first is to make the idea of student agency much more clearly central to the framework. Doing this will provide the framework with greater simplicity and impact, it will help to integrate and animate it.

Second, the idea of student agency – of learning leading to responsible action – needs to be fleshed out in a more rounded way, including the levels at which agency operates (individual, collaborative and collective agency); the kinds of domains in which students are agents (moral, creative, economic and political) inside and outside school and the preconditions for agency (the links between knowledge, attitudes and skills, both personal and social.)

Third, the idea of agency cannot be too culturally specific. It has to be open to interpretation from different cultures and settings. Agency may well mean quite different things in Japan, Germany and Canada. It will mean different things for children at different ages from primary through to post-secondary.

Fourth, acknowledging these differences and nuances, will better enable advocates to avoid promoting too narrow a version of the idea. All powerful and interesting ideas usually have drawbacks, limitations and unintended consequences which are too often not acknowledged when they are being promoted. It would be wise at the outset to recognise those potential limitations and downsides so they can be acknowledged and accommodated within the framework. There will be settings in which it is not appropriate for young people to be agents but instead to follow the lead of teachers and parents. There will be settings in which considerations of community cohesion and social obligation override individual agency. The challenge will be to find the right balance for children of different ages in different cultural settings.

3. Four Components of Agency

Four components are essential to the idea of students as agents.

3.1. First, they should be purposeful.

They should learn because they have set themselves goals which they choose and endorse and which they pursue intentionally. Purpose helps makes learning meaningful and so

motivating. It also provides students with a sense of perspective, to learn what most matters to them. Developing this sense of purpose is essential for students to learn what matters to them and so what matters to learn. From an early age children should get used to this process of goal setting.

Purpose means having a sense of directedness that provides one with goals and with a sense of meaning. Purpose is a broad and sustained intention to accomplish something one finds meaningful, to the self and often also to the wider world. Purpose is about what matters to you over time, driving life goals and daily decisions by guiding finite attention, energy and resources. A sense of purpose helps people to navigate their way through complex, shifting and confusing environments.

3.2. Second, students should become reflective through learning by doing and in action.

It is not enough for students to be active investors, nor simply to be persistent. They also need to become adept at reflecting on what they are learning. They might be learning about themselves: what goals matter to them; what skills and capabilities they have. They might be learning about the world, how it works and what knowledge they need to understand and so shape it. In the course of pursuing their goals they will learn about how their plans work in the real world and so how to adjust in the light of learning in action. They might be learning about how well they work with other people, how to adjust to their needs and contributions. Students will become more effective in pursuing the goals that matter to them if they learn to reflect in action.

Reflectiveness is central to the DeSeCo framework. A reflective practice involves the use of meta-cognitive skills to take a critical stance when deciding, choosing and acting. It is the ability to step back from the assumed, known, apparent and accepted and to reflect upon a given situation from other perspectives, to look beyond the immediate situation to the longer-term and indirect consequences of action.

3.3. Third students need to make an investment in actively pursuing their purpose.

Agency requires making an investment of time and effort, intellectually and often physically. It also requires persistence to stick at things, to overcome setbacks and obstacles. Making a commitment to a project with an uncertain outcome – a feature of all learning - involves taking and then managing risks. To achieve a goal requires developing capabilities to bring it about. Agency is not just making choices between alternatives, like a consumer. Agency requires investment, effort and capability to bring something about, to make it happen. Investment involves risk that what you hope and plan for does not work out. The capacity to make this kind of investment is a key determinant of success. Children from disadvantaged backgrounds often need more support to make this investment that children from more middle class backgrounds might take for granted.

3.4. Fourth, students need to learn to take responsibility for their actions.

Responsibility is central to a mature sense of agency, to see that actions have consequences and that we have power to affect others even if only in limited ways.

Responsibility has two main components: an understanding of one's role and what is expected of it; the belief that personal choices and actions can influence events in life, for better and for worse. To have a sense of responsibility people also need a sense of self-

awareness and control, they need to be have a sense that they are able to shape their lives and even provide their actions with an underlying, coherent narrative.

Being responsible means being accountable and keeping agreements as well as accepting credit and acknowledging mistakes. Acting responsibly in relation to others means acting ethically.

These four components – purposeful, reflective, responsible investments in learning - need to come together for students to develop a fuller, deeper sense of agency. The goal of education should be for young people to become purposeful, reflective, responsible and so capable agents. One might say, echoing Schneider et al, that optimal learning moments are moments when students feel interest and face stretching challenges which require them to turn their skills and knowledge into action.

4. Levels of Agency

The discussion about education leading to agency and action often focuses on competences and capabilities which are assumed to belong to individuals as if the test is whether a person can take action. Earlier contributions to the OECD’s framework for example stressed the ideal of self-sufficiency and self-determination. Yet students need to experience a sense of agency at three levels: the individual, the team and the collective. Agency is often collaborative: it’s about individuals making their contribution to a shared effort with other people.

4.1. Individual

Personal agency should focus on the individual as an agent, for example through personalised forms of learning organised around an individual sense of purpose. The learning from this kind of activity should be about personal goals, strengths and weaknesses, including the ability to frame and set goals, to plan and keep to deadlines, to adjust to setbacks and regulate emotions. Education should be a deeply personal journey for young people to grow and develop their sense of identity and capability, who they are and what matters to them, what they are good at and what gives them a sense of achievement. Too often education feels like an impersonal experience of fitting into a wider system of levels, exams and grades.

4.2. Collaborative

Young people develop their sense of identity through relationships; we find out who we are through what we share and how we differ from other people. One of the most important lessons young people learn as they grow up is that very little significant can be achieved entirely on their own. Solving complex problems, exploring interesting opportunities, creating valuable work invariably involves the combination of people with different skills, resources and insights. Learning how to work in teams, with others, to address shared challenges will be a fundamentally important skill in an economy which is

more fluid, entrepreneurial and in which organisations are flatter, less hierarchical and more lateral. Understanding collaborative agency, how to work with others to pursue a common goal, thus will be vital to the future. That means young people having experiences of achieving things in teams, whether through project based learning, drama, sport, outward bounds, charity work and service learning it is an important for young people to become adept at collaborative agency.

This collaborative dimension to agency is fundamental in many non-Western societies. Take Japan as an example. One theory of Japanese character is “Kanjin-shugi” or inter-individualism, which emphasises “betweenism in human relations.” Relations between people are more important and powerful than the individuals on their own. This is one reason why many Japanese people are cautious in expressing clear individual opinions. They are more likely to take their cue from the social atmosphere. Thus Japanese have many different ways to talk about the themselves as individuals depending on the social setting. It is not as simple as referring to themselves as “I”. Instead they use different phrases depending on the social relations involved – “Watakushi”, ‘Boku’, “Ore”, “Shousei” and “Jibun.” In Japan then the notion of the individual is derived from relations within a community: the community is primary. In some Western traditions one might say communities are derived from relations among individuals who choose to associate: the individual is primary.

Yet this sharp distinction is too clear cut because Western thinking contains many different currents which take a more relational, holistic view of the subject. A prime example is Martin Buber, the Austrian, Israeli philosopher who developed a highly influential theory of “I and Thou.” Buber argued that all existence was an encounter between beings and so could only be understood in mutual, reciprocal and holistic terms. Buber argued that an “I” always implies a “Thou” which it is in relation with. Michael Walzer, the American philosopher echoes this idea when he argues that we only find out who we are in the midst of relationships we have.

Capable individuals are not self-sufficient loners. They are adept co-operators. As Katarina Salmela-Aro’s, from the University of Helsinki, makes clear in her paper on co-agency this means exploring how students work with other people, whether that is with peers through collaborative learning, with parents supporting their children especially at critical stages of education and collaboration with teachers. Capable individuals have relationships to draw upon for resources and support as they learn. “Co-agency refers to the idea that students, their parents, peers and teachers co-regulate reciprocally their development and well being during their educational career.” Schools are not just dealing with individuals but individuals nested in critical relationships. Education is often more successful when it becomes a shared project for students, parents, peers and teachers. Students are far more likely to learn when they are nested in relationships which support them to learn. Finding the right balance of support, control and autonomy as children develop is critical. Taking into account these relationships, peer influences and family background may well be particularly important factors for children from disadvantage backgrounds who face particular challenges in making academic school a high priority.

4.3. Collective

Finally young people should understand what it feels like to be a part of something much larger than themselves, a community, a movement, a society, stretching up to the global level. This sense of collective, shared agency and responsibility matters for many reasons. It helps individuals to place themselves in a larger social whole, to feel a sense of

belonging and identity, shared achievement and purpose. Many of the biggest challenges we face are collective in nature, not least in respect of the environment and climate change. Making a collective impact on complex challenges requires mobilising people across society and systems. That requires systems thinking, to synthesise knowledge from different sources but also the capacity to connect with people beyond your immediate social circle, who may come from different backgrounds and have different views of the world. Big changes in the world comes from coalitions and movements.

This sense of collective agency *and* responsibility is more important in the context of a world being remade by global developments often in far flung places, through for example climate change, civil conflict and migration. This is an important antidote to the echo chamber culture of social media which creates very narrow and self-reinforcing forms of socialisation. The growth of echo-chamber culture will inhibit people from dealing in a constructive way with differences, contradictions and ambiguities, tensions and trade offs for example between equity and efficiency, autonomy and solidarity, ecology and economy, friends and strangers. To be prepared for the future students have to learn to think and act in more integrated ways, taking into account the manifold interconnections and interrelations between at times only superficially contradictory or incompatible ideas.

Students should feel a sense of agency as purposeful, reflective, responsible capable investors at three levels, the personal, the collaborative and the collective. Personal agency is a vital contribution to collaborative and collective agency but also a counterpoint to it. Young people also need to know when to stand out from and against the crowd, to think independently when everyone else is going in another direction.

Experiences of personal and individual agency should give them a sense of what they can and want to achieve on their own and the sense of personal satisfaction that comes from that. Collaborative agency should give students an understanding of when they need and what is like to work with others to achieve an important shared goal. Collective agency should encourage them to see what it is like being part of a larger collective which is capable of coming together to achieve important goals and exerting a larger sense of responsibility for their society, engaging with people outside their normal social circle who may have different views of the world from theirs.

Table 4.1. Level and Components of Agency

	Personal	Collaborative	Collective
Purposeful	Personal Goals	Team Goals	Shared Goals
Responsible	Individual Conscience	Contracts commitments	Rights and responsibilities
Reflective	Personal space/meta cognition	Social dialogue	Collective reflection and review

5. Aspects of Agency

Students should learn to exercise this sense of agency across four dimensions of life which are sometimes in tension but need to work together for students to feel a rounded sense of agency. These dimensions underpin the curriculum of many education systems and the E2030 Framework.

5.1. Moral agents

Developing a sense of moral agency means distinguishing right from wrong and acting on what is right. That means making good on obligations and commitments, to one self and to others, even when self-interest is pulling one in the other direction.

The content of what is counted as moral behaviour and the values which inform that may vary among different communities and across generations within a country, as well as between different countries. In some places where there is a stronger sense of individualism and individual rights there may be more of a stress on individual choice in determining what is right. In others where there is a greater stress on deference to collective interests and tradition, including within families and organisations, there will be more of a sense of obligations to a wider community. Western traditions of moral agency based on rational and sometimes utilitarian accounts of what is right are very different from many Asian countries which stress mutual obligations and a sense of responsibility to a wider community which constraint scope for individual action.

Again, a good example is Japan where education has traditionally embraced “Chiiku”, cognitive education; “Tokuiku” moral education and “Taiiku” physical education. Moral or character education is considered by many to be the most important focus for education. As Professor Tadahiko Abiko put it in a draft background note: “In Japanese pedagogy the aims of schooling is roughly divided into Character cultivation and Ability raising or improving. And in the Japanese tradition the former should be prior to the latter ...the reason is that Character is the whole and Abilities are its part. ..Character gives a direction or an aim of learning and abilities work as means or tools to reach the goal and achieve the objectives.”

So what counts as moral agency differs between different societies. However the idea that moral agency counts does not differ and nor do some of the most basic precepts of

morality, for example concerning the importance of keeping promises and not turning your back on those in need.

One of the assumptions underlying DeSeCo was that individuals are expected not to simply follow instructions. Many of the contributors argue that dealing with novelty, change, diversity, ambiguity and uncertainty, and coping in a responsible way with important challenges, assumes that individuals can think for themselves, reflect upon their actions in the light of their experiences and personal and societal goals. This includes thinking critically what is right and wrong.

The perception and assessment of what is right or wrong, good or bad in specific situations is about ethics and the formation of a moral agent, someone capable of ethical action. It implies asking questions before acting related to norms, values and meanings and limits such as: What should I do? Was I right to do that? Critical thinking is the cognitive process by which we evaluate and choose among alternatives consistent with our ethical principles.

There are also important connections between knowledge and ethics, which revolve around the role of evidence, expertise and trust. To be a scientist or an historian is also to be part of an ethical community, respecting evidence and arguments even if one does not agree with them and being willing to challenge what one has taken for granted. Ethics can be taught through specialised courses but a capacity to distinguish right from wrong and to act accordingly is as much about the norms of community that students belong to.

Moral agency is relevant at each of the three levels individual, collaborative and collective.

For individuals moral agency means understanding how to act on what you as an individual think is right, to develop and follow your conscience and to learn how to keep promises and obligations to others.

In teams moral agency requires dialogue among a group to understand how to make shared commitments and follow shared moral codes of behaviour, for example to share rewards and to reciprocate when cooperating. One of the biggest challenges of working in groups is to understand how to prevent and deal with problems with ‘free-riders’ : individuals who benefit from group cooperation but do not contribute that much to it. An equally important challenge is to know when as an individual to challenge a group in which there is a consensus enforces a kind of moral conformity.

Collective moral agency is about understanding the responsibilities an entire community of which you are part – like a school community – may have to others outside it, especially those who are less fortunate. That matters especially for understanding how to contribute to tackling diffuse and large social challenges like climate change and migration.

Agency implies a power to change or affect the world, and with that should come a sense of responsibility. Encouraging young people to see that connection between power and responsibility should be fundamental to modern education. We live at a time when humans have more power than ever to shape the world - the so called anthropocene – and to shape ourselves. Soon through science we may acquire huge power to reshape our own lives, enhancing our minds and bodies using sophisticated intelligent technologies. In this setting of immense collective power, a matching sense of ethical responsibility about how that power should be used and for what goals is critical.

Table 5.1.

	Individual	Collaborative	Collective
Moral Agency	Keeping promises and obligations	Cooperating and dealing with free riders	Collective commitments to public goods and common standards

5.2. Creative agents

Education should help young people develop an understanding of themselves as creative agents, with the power to make things and bring them into the world. This is the foundation of the capability and being able to do good, satisfying work. Doing good work is arguably the most important setting for personal growth and self-expression.

This sense of learning by making can be very broad, ranging from a film and a play, to making music and making food, to researching a project and making a presentation. At the most basic level it means learning to bring into being something new. That might involve artistic creativity but it may just as easily be a practical, craft skill or for that matter a scientific experiment.

Going to school should be a productive, making activity, in which children learn in different settings what it takes to craft great work, especially the process of drafting, revision and refinement that goes into producing work that is excellent. That is how young people learn by seeing themselves reflected in the work they have done and through other people's reactions to it. Making things with what you have learned is a vital way to make learning visible and thus to get feedback.

This kind of creative agency requires students to link "I wonder" – expressions of imagination and possibility to – "I do" – how to bring those possibilities into being. It requires both imagination and disciplined, focussed action.

One aspect of this is the likely increased significance of craft and practical skills, including digital skills – such as coding and 3D printing – as well also older, more traditional practical skills that may be even more valuable in an age of artificial intelligence. In the age of smart machines humans may find that their critical advantage lies in doing older kinds of jobs which involve face to face service and craft work. As the E2030 DeSeCo2.0 paper puts it: "Through understanding of how something is done, or made, we will be able to adapt such knowledge to other domains." Through craft one can access creativity, with a do-it-yourself and do-it-together ethic.

This very broad sense of creative agency as bringing the new into being can operate at all three levels: the individual, the collaborative and the collective.

At the individual level creative agency is expressed through individual, personal work, including for example art and design, as well as writing and problem solving. This builds up individual capabilities, the muscles doing for good work, which include persistence, resilience and reflective practice.

Collaborative creative agency comes through creative team work, in which good work can only be produced through intensive creative collaboration between people with a mix of skills and contributions. Learning how to be part of a collaborative and creative team should be a fundamental experience of modern education as this capability is so vital to modern life.

Finally collective creative agency stems from being part of a creative community with a shared sense of cause or mission, to which individuals contribute and from which they draw shared strength. Learning to be part of a larger community which makes a longer, deeper and most lasting contribution than your own is a vital experience both to amplify individual power and to provide it with a context, including for example a respect for tradition.

Each of these levels of creative agency is evident in music training, which includes individual practice and performance, to playing in a band or with an orchestra. Those levels might also apply to software coding and making food. Young people should learn how to develop distinctive skills which they know how to combine with others and contribute to a larger mission or project.

There is a circular and reinforcing relationship between the capability of individuals and the capabilities of the teams and communities of which they are a part. Great swimmers do better as part of great swimming teams. The swimming teams do better because they have great individual swimmers.

Individuals are far more likely to be resilient if they are part of a community which is both supportive and demanding. This is why individual agency, doing it yourself, is inseparable from co-agency, doing it with other people. Individual and personal capabilities mean little unless people have the social capabilities to work together with others.

Table 5.2.

	Individual	Collaborative	Collective
Creative Agency	Individual skill/talent	Working in teams and ensembles	Collective impact

5.3. Economic agents

One of the most important expressions of moral and creative agency will be how people act as economic agents in the broadest sense, whether that is through work for a wage, as entrepreneurs, in the voluntary sector or in unpaid labour. In all these roles people generate economic value whether or not they are then paid a market rate in exchange for that value.

Economic agency will be imperative because many of the jobs available in the current economy, both manual and white collar, which involve following routines and following rules may well be automated in the future. This will happen as jobs are broken down into discrete tasks some of which can be done by machines. This is already happening in medicine and surgery for example, where robots are better at many forms of laser surgery that require pinpoint accuracy than humans whose hands tend to shake. In future doctors may make critical decisions and engage with patients but the actual surgery is likely to be conducted by artificial intelligence. In a more fluid, uncertain economy, driven increasingly by innovation using technology, people will need to be more adaptive and entrepreneurial, even within large organisations. The ability to create value that cannot be created by intelligent machines means focussing on human qualities of creativity, empathy and imagination. When machines are skilled at following the script, humans will need to be skilled at making up the script. When machines excel at following the rules, humans will need to spot when the rules need to be put to one side.

Since their inception education systems one goal of education systems has been designed to prepare young people for a world of work, mainly by preparing them to following instructions, in quite repetitive jobs, within hierarchical organisations in which someone in authority will tell you what you should do next. In the 21st century economy young people will have to understand and decide what to do next. The most interesting and valuable work will involve non-routine problem solving and human capacities for empathy, care and attention.

Preparing young people to be economic agents does not mean pushing them down a narrow vocational path to a set of jobs that may well not exist in ten years time. It means helping them see how they can create economic value with and for other people in the widest possible sense: how they can make a valuable difference to the world.

Compulsory schooling has expanded as an alternative to young people being at work. Work and school have been at odds with one another. In future it is likely that this line will have to start to blur to give young people the kinds of experiences they need of modern work that will prepare them for it.

The European Commission recently recognised these shifts with its Entrepreneurship Competence Framework, in which entrepreneurship is defined very broadly as : **the capacity to turn ideas into action, to create for value for others.**

This sense of economic agency, that young people understand what it takes to help create economic value, for other people, operates at three levels: the individual, the collaborative and the collective.

For individuals it might mean work programmes and placements which they choose to develop their understanding of what kind of work appeals to them.

For teams it might mean creating a business together, within the framework of the school, either to provide services within the school or to sell them to customers outside.

Collectively schools might become modelled more on productive, economic communities. That is true for example of Studio Schools and University Technical Colleges in the UK: they are schools modelled more like businesses. At many of the schools involved in the Teach a Man to Fish movement, children work while at school on businesses which help to generate revenues which pay for their schooling. A growing number of farm schools are self-funded this way. This is just one example of how these ideas of student agency can apply to children learning in order to make a living while growing up challenging and difficult circumstances.

School should not be preparing young people for specific jobs, nor even specific vocational and technical skills that might be quickly outmoded. They should be equipping people with the capabilities and habits they will need to prosper and to make a difference in an economy which will be both more entrepreneurial and more empathetic.

Table 5.3.

	Individual	Collaborative	Collective
Economic Agency	Job roles and training	Business and venture creation	Schools as productive businesses

5.4. Citizen agency

Learning to be a citizen agent means understanding what it means not just to have rights and responsibilities but how to act on them and make them real. Once again this depends on a dynamic relationship between the individual as a bearer of rights and a wider community of fellow citizens. We can only be citizens within communities of fellow citizens whose rights we also have to acknowledge. To see oneself as a citizen means to acknowledge our membership of a larger community. Agency and co-agency depend on one another.

Learning about citizenship in a narrow sense might mean understanding the history of rights and responsibilities in relation to the society and state. There has recently been a growing emphasis on global citizenship education to emphasise these responsibilities.

However just as important is the real and lived experience that young people gain through school as collaborative self-governance, learning how to govern a community together with teachers and other adults. In most schools good discipline is the result of a form of collective self-discipline and shared governance, which stems from a sense of shared responsibility to and respect for other people.

Learning the skills and habits of collaborative self-governance is vital to the modern sense of what it means to be a citizen. The traditional definition of citizenship is vertical and stems from the relationship between the citizen and the state: the citizen grants the state certain powers in return for rights and protections. The modern spirit of citizenship adds a lateral dimension to this relationship: especially in cities and among people connected on social media citizens increasingly govern one another. The role of the state is to create a framework for this collaborative self-governance. This includes how to manage conflict, respect different interest and points of view and how to respect the rights of minorities. This is especially important given the growing diversity of the ways in which young people self-identify not just culturally and ethnically but in terms of their sexual orientation and lifestyle. Increasingly around the world young people have a finely tuned sense of fairness and equality of respect.

Going to school is a profound, formative experience for children because it means understanding how to be part of a community much larger than a family, with authority exercised by strangers and in which a child needs to learn how to get along with other children, possibly quite different from themselves.

The key competencies promoted by the OECD DeSeCo are relevant in a context which cannot any longer be taken for granted in developing and even developed economies in which democracy and respect for human rights and sustainable development are considered core values. While the values of democratic culture of self-determination and mutual respect are spreading round the world there are signs that commitment to democratic institutions and the rule of law cannot be taken for granted in countries which turn to authoritarian leaders. Indeed some political commentators, such as Larry Diamond, at the Hoover Institution argue the world is going through a democratic recession.

This changing context makes citizen agency an even more important part of education. This is reflected in the work of the OECD and UNESCO. UNESCO's Global Citizenship Education programme for example aims to: "Empower learners to assume active roles to face and to resolve global challenges and to become proactive contributors to a more peaceful, tolerant, inclusive and secure world." Meanwhile the Council of Europe is

promoting global citizenship as a way to strengthen democratic culture. The term “culture of democracy” rather than “democracy” is used to emphasise the point that while democracy cannot exist without formal democratic institutions and laws, those institutions cannot work in practice unless they are grounded in a culture of democracy rooted in norms, values, attitudes and practices. Those norms, for example, include the idea that conflicts should be settled peaceably, that majorities may rule but must respect the rights of minorities and that citizens should express their opinions freely but also listen to and respect the opinions of others. Education should provide a democratic culture in which young people learn how to act as responsible citizens.

For the individual student this will mean understanding what it means to have both rights and responsibilities as part of a larger community which needs rules and norms, but which should also respect people regardless of their differences.

At a collaborative level it means learning the skills and habits of self-governance with others, which entails learning how to respect the contributions of others and how to abide by collaborative decision making.

At a collective level it means understanding how a school or college functions with rules, norms and legitimate forms of authority.

We are at a time when political systems around the world are in flux as the societies they govern face significant economic and social challenges which politicians are being called upon to address. One aspect of this is a long-term trend towards political disengagement as turnout in elections and membership of political parties fall. Another is the apparent fragmentation of traditional political parties and the growth of formerly fringe and sometimes populist parties. Yet another is the apparent appeal in some parts of society, especially those suffering from economic decline, of more authoritarian, populist solutions which stress mono-cultural ethnic identity. In the context of slower growth and quickening innovation, most developed societies are experiencing new tensions between educated, cosmopolitan, urban populations and those who have less education and live in more homogenous communities in rural areas and small towns. Age is also becoming a key dividing line in many societies straining the intergenerational social contract. Meanwhile new political challenges are emerging the whole time, around climate change, migration and diversity. All of this means our political systems of collective decision making will face immense challenges in the years ahead. Preparing young people to play a full role in these debates and decisions will be a critical task for education systems. To equip young people for the future schools should need to ready them to be capable citizens.

Table 5.4.

	Individual	Collaborative	Collective
Citizen Agency	Rights and responsibilities	Collaborative self governance peer-to-peer	Collective norms, rules and authority

6. Learning to Acquire Agency

Andreas Schleicher puts the challenge for education systems this way: “The foundational reason for why we find it so difficult to rebuild school curricula around the needs of the modern world is that we lack an organizing framework that can help prioritise education competencies and systematically structure the conversation around what individuals should learn at various stages of their development.”¹

Student agency – a full set of capabilities to succeed in the modern world - provides that organising idea.

Young people should emerge from school being able to read and write, to add and subtract, to use computers and calculators, to understand a map and the history of the country they live in, to have a good grasp of basic scientific theory and a foreign language.

Yet if education is to develop young people as capable agents it can no longer rely so heavily on learning by routine. It needs to take young people wider, deeper and further, to give them experiences of what it is like to take action, to make things, to serve the community, to work with others and to take on challenges that might once have daunted them.

To prepare students for a modern economy, schools will need to be places where students develop a sense of agency and responsibility, learning how and when to take the initiative, when to wait for instructions and when to act, how to turn an idea into something tangible, often working with others to do so.

Learning and doing are intimately connected. A good test of whether a student really understands what they have learned is whether they can apply that knowledge in novel situations, away from the controlled environment of the classroom. Quite a lot of useful skills – learning to scuba dive or to bake bread – can only come from doing the activity, in practice.

The development of this sense of agency depends on a dynamic interaction of three aspects of learning: knowledge, personal growth and social skills.

6.1. Knowledge

Learning is the acquisition and assimilation of new knowledge, through an iterative and cumulative process, which requires patience, effort and energy, as new knowledge is integrated with old. ²What you know to start with is one of the most important determinants of what you can go on to learn. The gap between what you already know and the knowledge you are trying to acquire, which can be unfamiliar and challenging, frequently creates a fear of failure. Our working memory can often become overwhelmed when dealing with novel, apparently disorganised and unrelated information. Finding new patterns, rules and regularities to make the new information meaningful is an effort. Good

¹ Introduction to Fadel, Four Dimensional Learning

² Hattie and Yates

teachers excel at traversing students across this gap, structuring learning so it is motivating and stretching, not overwhelming and confusing or repetitive and dull.

There is growing consensus that the kind of knowledge education builds up should be a dynamic mix of sound basic skills, crucial core knowledge and higher order thinking. Sound basics, especially literacy and numeracy, as well as basic cognitive processes, like executive function, which affect memory, are essential building blocks for learning. Young people should also acquire core knowledge, in history and literature, science and mathematics, to help ground them in a sense of who they are, where they come from, what kind of society they are part of and the wider world they inhabit and engage with. What really matters, however, is whether this then enables students to take on more complex, higher order cognitive tasks involved in creativity and problem solving.

To be capable agents students need to be able swiftly to recall and deploy basic building blocks of knowledge without having to learn them in the midst of the process. As learners become more skilled and proficient so they can also become more creative, learning how to test, adapt and manipulate knowledge. They should enjoy a growing sense of agency, that they can make and do something with their knowledge. Action, learning and knowledge needs to be developed dynamically.

6.2. Personal Strengths

Learning should be a personal journey of growth and discovery. There is no neat boundary between the cognitive, social and emotional aspects of learning. They constantly interact. All learning requires personal strengths of persistence, effort and focus to overcome fears, self-doubt and obstacles.

Education should help young people develop personal attributes of character that will count in later life. Their capacity for grit, resilience, persistence, growth and curiosity, will be at least as important to their success as their ability to recall the answers to tests in history or chemistry they sat when they were sixteen. In the modern shifting world young people will need not only to be resilient and adaptive, they will also need to have a clear sense of purpose, to know the difference they want to make, the value they want to add.

Resilience and patience is vital to the acquisition and mastery of skills required for full agency, a point that Professor Tadahiko Abiko makes in relation to reading skills in Japan. Reading skills have a crucial role as a tool to further study. The acquisition to these skills required patient, sustained practice and learning. The capacity for agency cannot be acquired overnight. As Professor Abiko puts it: “Agency needs to have patience or resilience not only in problem solving but also in repetition or exercise during children’s learning.”

These personal qualities - growth, persistence and purpose - cannot be developed through traditional instruction alone. Telling children what it means to be persistent and even giving them inspiring examples of persistence is not the same as providing them with powerful, lasting experiences of those qualities in action.

Finding out who you are, what you stand for, what makes you different, is not just an inner journey. We find out who we are in the context of the relationships that form us, by how we collaborate with and distinguish ourselves from other people. Personal growth and learning is only possible in a social context, which is why dynamic learning has to be a collaborative enterprise.

6.3. Social Skills

Acquiring new knowledge is invariably a collaborative affair: it involves dialogue and discussion to understand and explore both the question and its possible answers. Giving and taking feedback, from peers, students and teachers is critical to how people learn to improve their work. Learning how to get on with other people is one of the most important unwritten lessons of school. To prepare people for an economy in which non-routine problem solving will be perhaps the most vital human skill, schools need to develop deeper and more sophisticated social and emotional capacities required for this kind of work.

When many basic tasks, like booking a plane ticket, scanning a bar code, or adjusting a thermostat, can be done by artificially intelligent machines, human work will focus on face-to-face, service work, which cannot be outsourced nor automated. We need to excel at being human. These personal services will require people who are empathetic and caring, emotionally intelligent and responsive. Schools that focus on drilling children to follow instructions will not fully develop these social and emotional skills which many employers now regard as essential.

Solving a complex problem – such as how to build a low cost house for refugee families who do not speak Spanish - usually imposes a heavy cognitive burden on an individual. That burden can be made manageable through collaboration. The problems are broken down, the tasks shared out, the solutions assembled from contributions from many people. That is why real world innovation is an inherently collaborative activity, often stretching across national boundaries and cultures. Agency is often individual but more frequently it rests on collaboration and so school needs to build these social capabilities.

6.4. Learning to be an Agent

Learning to become a capable agent and a creative problem solver requires a dynamic combination of cognitive and non-cognitive skills, hard and soft, explicit and tacit, academic knowledge and entrepreneurial ambition.

Schools achieve that mix in many different ways but they are all dynamic places to learn. These schools do not fall prey to false dichotomies that separate the head and the hand, theory and action, the personal and the social. On the contrary they get beyond these divisions and create new combinations. That is what makes them so dynamic.

7. Developing Agency in Practice

Several OECD jurisdictions have already moved to make the development of student agency central to their education systems. These are just some brief examples:

- Singapore is seeking to develop confident people, self-directed learners and active contributors with a strong emphasis on values of respect, responsibility, integrity, care and harmony.
- In Canada, Alberta is aiming for engaged thinkers and ethical citizens with an entrepreneurial spirit and British Columbia has a curriculum organised around simple principles of understand, know and do.
- Australia's core curriculum aims to develop successful learners who are confident and creative individuals and active citizens.
- South Korea envisions students who "seek individuality for the growth of the whole personality, exhibiting a capacity for a fundamental creativity."

The curriculum of many countries' education systems are developing to integrate more completely cognitive and non-cognitive skills, knowledge, attitudes and skills, to develop students who have the capacity to act confidently and responsibly in the world when they emerge from school.

This shows the idea has wide appeal and resonance. It can be applied in many different settings. However that will only be possible if the idea is open to adaptation in different cultures. It cannot be based on a narrowly Western view of agency. There is no good translation of the idea of "agency" into Japanese for example. This will lead to misunderstandings. Many might initially think that agency means child-centred or student-centred education.

Agency is often associated with an idea of the choosing, rational subject, interrogating an objective outer world, which derives from the dualism of subject and object, mind and matter, which are central to Enlightenment thinking. That is at odds with other traditions of philosophy which see the subject as part of the world, entangled with it and relationships. In these views the active subject and the world are co-dependent; they interact and define one another.

While developing agency is vital for young people so too is learning how to behave in appropriate ways in social settings, a critical aspect of education in many Asian countries, such as Japan. This means accepting norms of behaviour which are learned and adopted from others rather than created from within. Part of life in a complex society involves following rules and routines without necessarily fully endorsing them. Part of being at school involves the acceptance of legitimate authority. That is especially true in more conservative traditions of education and in societies that place a greater emphasis on communal obligations, tradition and deference to hierarchy. What we mean by student agency needs to take account of these different contexts and conditions. It cannot simply be a recipe for a narrow kind of atomistic, rationalistic, individualism.

Equally the idea of student agency needs to be able to apply across the spectrum, from children learning in well-equipped schools in modern developed economies to children learning in challenging circumstances where schools are poorly equipped and life is hard.

Student agency needs to develop and build through the different stages of education. What it means for a child in primary school will be very different from secondary and post-secondary.

Nothing about the world that young people face is straightforward. To thrive, young people will have to be alert and open, able to contribute alongside others and work outside normal parameters, to fly without autopilot, especially in a crisis. It is a world full of opportunities to make what you will of life and yet also replete with risk, uncertainty and inequality.

Our current education systems work hard at developing basic skills and imparting core academic knowledge—this is critical. Diligent, obedient hard work is typically rewarded, as children learn how to stay “on task” – to focus, isolate, analyse, to do as they are told. Yet they also need to learn how to make themselves available to the world around them and to worlds beyond their own; to see things as a whole and to make connections between ideas; to find their own tasks and purposes to become committed to. Young people will need to judge when it is right to follow instructions and stick to the rules and when to take the initiative with other people without looking at a manual. They will need to be brave enough to open up interesting questions when there is no obvious right answer and to take action when the outcome is uncertain. That will require persistence and resilience as they try out solutions, fail, adapt fast to feedback and try again, overcoming obstacles and learning from setbacks, as they pivot, twist and turn to find the best way forward. Too much learning in school locks knowledge in subject silos; creativity and insight often comes from finding connections between those disciplines. For too many students the point of school is not to excite their imagination, encourage creativity, build self-reliance, form character, learn self-governance, strengthen resilience nor develop them as leaders. Instead children are schooled to put aside what fires them up and to knuckle down to what gets them through.

That kind of education will not equip learners for the world we now face. Too many are set up to fail. All children should enjoy education as a dynamic experience that will equip them to be agents of change. That may sound like a tall order. Yet two hundred years ago it would have been regarded as wildly unrealistic to expect everyone to be literate and numerate.

These four components – purposeful, reflective, responsible investments in learning - need to come together for students to develop a fuller, deeper sense of agency individually, in teams and collectives, as moral, creative, economic and political agents. The goal of education should be for young people to become purposeful, reflective, responsible and so fully capable agents.

Observations on 'Taking Responsibility' and 'Coping with tensions and dilemmas'

AC Grayling

1. Taking Responsibility

The concept of ‘responsibility’ belongs to two families of concepts. One family relates to ‘accountability,’ ‘being the proper target for praise or blame,’ ‘being answerable for,’ and often has a negative connotation, as being ‘guilty’ or ‘culpable’ for something, though the generic sense of ‘accountability’ (being accountable, being the person with final answerability for something) is neutral. This is the sense at issue in ‘He was responsible for the breakdown of the engine because he did not repair it properly.’

The other family of concepts relates to ‘having authority,’ ‘having a duty,’ ‘having control over something,’ ‘having the care of,’ and by extension ‘being trusted with,’ as when someone is responsible for completing a certain job, or for the safety of a child crossing the road. This is the sense at issue in ‘You are responsible for looking after this child as you walk to the shops.’

There are of course connections between the two families of concepts, in that failure in carrying out responsibility in the second sense earns the negative judgments associated with the first sense.

It is however the second sense which is most significant for our purposes, given that the desire to encourage and enhance a sense of responsibility – responsible citizenship; a sense of responsibility (obligation, duty) to society and others to promote the good; a capacity for self-command, self-reliance and maturity, as in ‘a responsible person’ – should be one of the most important aims of an education for life in the complex and ever-rapidly-changing 21st century.

Digging into the Latin roots of the word ‘responsible’ (the direct etymology is *respondere* meaning ‘to answer, to return for something offered’) to the elements *res* ‘thing’ and *pon* as the root of ‘heavy’ (from *pondus* heavy, as in ‘ponderous’) suggests that ‘taking responsibility’ fundamentally means ‘carrying the weight of something’ – ‘bearing the burden.’ Indeed in English we have the phrase ‘shouldering responsibility’ as an alternative to ‘taking responsibility,’ with the connotation of lifting something heavy to be carried on one’s shoulder.

To take responsibility as an explicit act, as in accepting employment or entering a legal agreement, is a consciously acknowledged promise to carry out the task, duty or trust involved. In these formal cases a clear understanding of what is involved is, obviously, necessary, and there is an implicit avowal that one is capable of carrying out that task or keeping that trust. We speak of ‘diminished responsibility’ in cases where an agent was

not fully in a position to engage in that responsibility, through one or another form of mental, physical, or other incompetence, or because of incomplete information or as a result of being misled. Explicit assumption of responsibility requires clarity, competence and information.

But not all responsibilities are explicitly assumed; rather, they are implicitly acquired as a result of the mere fact of being alive. This is because human beings are social animals almost all of whom live in concentric circles of communities of successively widening diameter. So the mere fact of existence carries a range of implicit responsibilities: to family, friends, colleagues, associates, the nearer and the wider arenas of society. An understanding of what these different responsibilities entail, and how to manage conflicts of responsibility between and within these different levels when they arise, is a central theme of literature and of philosophical ethics, both of which make essential contributions to the education of the moral sense in individuals. Just as with explicit acceptance of responsibility, gaining a clear understanding of what is involved is necessary likewise; and this is the point of education about, and reflection upon, the responsibilities of being human.

We have responsibilities to others – including, arguably, other sentient creatures and the natural environment – and to ourselves. One of the most familiar areas of conflict of responsibility lies at the point where responsibilities to others contradicts responsibilities to oneself. In these cases the choice is between the sacrifice of one's own interests in the interests of others, and the fact that we have a responsibility not just to ourselves to look after our own welfare, but also to others to look after our own welfare so that we are not a burden on those others. If we assume responsibility for ourselves we not only exercise a significant duty to ourselves but will thereby prevent a burden from being imposed on others and be fit to exercise responsibilities towards others when appropriate.

Leisure, rest and recreation are periods in which the immediate exercise of responsibilities is in abeyance for a time. The fact that such periods are necessary to human welfare is itself evidence that many responsibilities are onerous, and therefore accepting them (choosing to become a parent, taking on a demanding job) itself has to be done responsibly.

What this comes down to is: thinking, anticipating, working things out, informing oneself about the realities involved, having a clear self-understanding, and at the same time having the courage and determination to accept important responsibilities and to carry them out well.

These latter points show that helping people to become responsible individuals is a general feature of the purpose of education, since encouragement to think critically, with clarity and accuracy, and to refuse to be satisfied with incomplete information and hasty conclusions, is what the whole of education is about. Accordingly it can be hoped that a pedagogical system devoted to making good thinkers will at the same time be one that encourages personal and social responsibility in all its forms.

2. Coping With Tensions and Dilemmas

It is an obvious, but in fact it should be a surprising, commonplace that people not only greatly prefer life to be relatively easy, but on the whole expect it to be so. Trouble, problems, difficulties, are vexing and stressful as a result of being unwanted and largely unexpected. It might safely be said that the degree to which problems are stressful is proportional to their unexpectedness and unwelcomeness.

Yet it is an equally obvious commonplace that problems and difficulties, loss and sadness, obstacles and failures, are a normal feature of human experience. A differentiator among people is the capacity to overcome difficulties, learn from them, and manage one's emotions in the face of them.

Shadows fall across our lives often enough for us to know that it is wise to be psychologically ready for the possibility. Difficulties are better managed when anticipated and one is prepared for them. Stress is often the result of feeling out of control, of not being able to manage circumstances. This is a large part of the reason why unexpected problems are stressful, at least until solutions have been identified and put into effect. A realistic view of life makes for a less stressful life, not because expectations and ambitions are reduced, but because the higher the expectations and the greater the ambitions, the greater should be the preparedness to encounter and overcome difficulties.

The sources of stress are not only problems and disappointments, or the sense of having too little control over events. It also arises from noise, crowds, sensory overload, too little time for solitude and reflection, insufficient rest, and other social and physical environmental pressures. A healthy life-balance is a known prophylactic against stress, centrally including good diet, exercise, periodic recreation and leisure. It is often emphasised that good relationships are a counter to stress. An individual who copes with the normal stresses of life in these ways is better equipped to deal with the added stress of unwelcome and unexpected difficulties when they occur.

A dilemma is a situation in which the considerations on both sides are equally or nearly equally compelling, making it difficult to decide what to do. This is very stressful, especially in circumstances of urgency or emergency, as in an operating theatre or in the cockpit of an airplane in danger. In cases where it is genuinely difficult to decide, one has to accept that 'acting according to one's best lights' is justified, and therefore to make a judgment call. If it transpires that one was wrong, and the other horn of the dilemma should have been chosen, one has the knowledge that at least one tried one's best, if that was sincerely the case. The claim that one 'tried one's best' can be a fig-leaf excuse for failure when the failure was actually the result of not sincerely and really trying one's best; but here the agent himself or herself will know the truth, and there is the inescapable fact that each of us has a responsibility to oneself to have integrity.

Stress is sometimes advantageous. A too relaxed attitude, a careless lack of effort, lack of focus, intensity and concentration, too little will-power and determination, are in most cases all negatives. The stress involved in the positives connoted here can result in greater effectiveness and success. Obviously, a balance is required: too much stress can be as obstructive as too little. Generally speaking we learn how to calibrate the levels of stress that help rather than hinder in the course of our usual activities. Transferring the skill with which we apply normal stress to abnormal situations is the mark of a mature personality: and once again, because enabling the development of mature and clear-thinking people is

a target of education, the capacity to live with stress, overcome its negative aspects, make good use of its positives, and not be defeated by it in unexpected and unwelcome situations, is connoted in that general aim.

Brief comments on ‘Creating new value’ and ‘Taking responsibility’

Tom Bentley

The outcomes and expert papers from the Lisbon meeting show good progress towards framing and defining the competences, and some further convergence between the scope and focus of the competences that need to be defined, and the evidence and analysis about learner development influences on learning.

1. Initial reflection: working between categories

The three ‘transformative competences’ reflect the need for learners and education to function and thrive *between* existing categories of thought and action, in an increasingly networked, uncertain and interdependent world. The growth of these connections increasingly blurs the boundaries between different spaces, social groups and categories of knowledge.

The competences that are being developed therefore need to help the learner to interpret and navigate that world of uncertainty and new opportunity, and help them to act more effectively in it.

In that sense, these competences are ‘meta-learning’ capabilities, in the sense that they need to help learners to guide themselves and develop their own learning over time, across a whole range of specific situations and experiences.

The papers and supporting evidence show with growing clarity that understanding how to set boundaries – to judge appropriate parameters for the task, the situation at hand and the people who are involved in it., is vital to these competences.

In other words, all three ‘transformative competences’ are deeply bound up with the development of both *intra*-personal, and *inter*-personal, understanding. Learning how to create new value, how to take and share responsibility, and how to cope with tensions and conflicts, all involve learning to understand the relationships between self and other, and how to interpret and judge value of different kinds, in different situations.

Rather than trying to carve the three competences into entirely distinct units, we should therefore seek both to identify the specific elements that are distinctive to each, *and* the common threads between them that might contribute to the development of successful learners over time.

2. Creating new value

AC Grayling's paper clearly identifies the cluster of concepts and the underpinning conditions needed to support the development of creative new perspectives, realise them in practice, and judge and evaluate their value in a range of contexts, or situations.

What strikes me most about the discussion so far is that it emphasises the importance of how to understand and judge 'value', perhaps even more than it focuses on novelty and initiative as the source of creation.

As AC Grayling's paper notes, learning how to create new value involves learning how to judge value 'after the event': "recognising whether something is creative or innovative waits on results".

This suggests a big shift in emphasis for education systems, away from 'preparation' of a pre-defined curriculum, with assessment structures and criteria determined ahead of time, towards an approach to competence in which embracing uncertainty, taking initiative, seizing new opportunity and learning to see different forms of value amidst diverse situations is increasingly important.

Two other factors are also embedded in all of the other discussions: the impact of new technologies, especially digital communications technologies, and the impact of growing social and cultural diversity.

This all makes sense. The outcome summaries from the Lisbon meeting also highlight the range of global pressures and trends which are creating demand for innovative new responses, for example the need to use *new technologies* to meet changing *social needs*, the need to foster social cohesion in response to challenges like large scale migration and the challenges of diverse communities facing economic and environmental risk.

Grayling's paper suggests that, to realise the potential for this competence, learners need to be 'liberated' from the traditional structures and benchmarks of existing education systems.

I think this is partially true: but it risks a mis-definition of the competence, as being something that can only be developed in spaces *outside* of the educational status quo.

The challenge, and the opportunity, is to define and scope the competences in a way that makes them sufficiently *clear and practical* that diverse education systems and OECD members can recognise them, while leaving them sufficiently *open and malleable* that they can be developed, tested and compared in practice across different contexts.

The need for new forms of value comes not just from the deep human impulse towards curiosity and new forms of expression, but also because the changing conditions facing learners are creating new demands, unmet needs, conflicts and ambiguity.

That helps to explain why the meeting summary note also clearly identifies the importance of emotions, dispositions, or attitudes; being able to maintain an attitude of calm, persistence, and self-management in the face of this complex swirl of conditions is an important part of this experience.

Competences, as defined by the OECD work, involve a *combination* of knowledge, skills and attitudes.

I therefore want to emphasis three particular features of the ‘creating new value’ discussion:

First, that developing a competence for creating value relies, not so much on being liberated from the existing structure of educational practices or measurements, and *more* from being able to repeatedly take new unfamiliar situations as opportunities to create value. This can occur in any situation where learners might encounter unfamiliar challenges or novel experiences. Learning how to approach them, navigate them, and judge different forms of value, is what matters to the development of the competence.

Therefore, the opportunities to build this competence come not just from dismantling existing educational structures, as from learning to recognise the opportunities in everyday learning experience, and build the skills and perspectives with which to create value from them.

Secondly, that, as AC Grayling says, this competence relies not only on novelty, but also on value. Learning how to judge different forms of value, how to evaluate and understand different perspectives and forms of value, depends on an ethical and evaluative perspective. Being able to address the social, cultural, civic, ethical, economic and environmental context in which specific actions and projects lie, is therefore an essential part of framing the competence.

3. Taking responsibility

A similar mix of considerations applies to ‘taking responsibility’.

Lawrence Steinberg’s paper helps to make clear the scientific evidence underpinning the ability to recognise different situations and perceive on’s own role in responding to them.

He explains how adolescence is a window of opportunity because of the plasticity of brain development and the importance of formative social experiences and examples in shaping the cognitive, meta-cognitive and affective bases for judgment and decision-making. So knowledge, skills and attitudes are also vital in this domain.

What Steinberg also makes clear is that the relationship between self and others – the ability to perceive and understand one’s own goals, and to address and influence the actions and others, is also vital to taking responsibility.

In a similar way to ‘creating new value’, this competence is developed through repeated application and experience in a wide range of situations. A specific definition, and dedicated time within a formal educational curriculum, might be useful. But the most powerful influence on the capacity to act responsibility comes through repeated experience of everyday situations, and the opportunity to reflect on them and learn from them, in part by learning from the example of others.

Developing both intra-personal and inter-personal competence go together in practice. They arise from the repeated experience of engaging with the world and then reflecting on how one's own perceptions and perspective may differ from those of others.

As the summary from the Lisbon meeting makes clear, the direct practical experience of taking responsibility through 'service learning' and problem-solving projects is vital.

I would emphasise the importance of learning to *formulate goals*, test them against experience, and understand the perspectives of others, in developing the capacity to act responsibly.

As Steinberg makes clear, *self-regulation* is a key to being able to develop and take responsibility. Self-regulation requires the capacity to 'see' oneself in a wider context, to understand one's own priorities and perceptions among many, and to assess or evaluate one's own desires in a wider schema of values and relationships.

This, in turn, depends on the development of *perspective*: the ability to see an action or outcome from various different points of view, and understand that different people will perceive it differently; and on the ability to structure and prioritise one's own goals, in order to focus one's effort over time in pursuit of longer term goals.

The meeting summary from the Lisbon discussion rightly identifies the risk that digital technologies might encourage a lack of empathy, or disconnection between perception and action in a world where digital networks operate separately from the everyday experience and decision-making of young people in their local communities.

This is true; there is a risk of disconnection and mis-alignment between the ideas and goals that young people might access through digital networks, and their own capacity to form goals, act, and reflect in the context of their own lives.

Focusing on 'service learning' or 'community-based projects' as a major opportunity for developing responsibility is a great opportunity: these projects can provide novel challenge, demand collaborative and team-based effort, and ground young people's learning experience in a broader context of shared, social responsibility.

I would also urge that, in considering these opportunities, the connections between such wider learning experiences and the ability of students to reflect on their own personal goals and motivations, and their approach to educational achievement, are also extremely important. In other words, framing the competence in a way that specifies and encourage reflective connections to be made between different domains of learning, is an important opportunity.

Data Literacy: Extending Literacy in the Age of Big Data

Daniel Kunin

1. Literacy in the Digital Age:

In 1948 thirty-two-year-old researcher Claude E. Shannon published a paper titled “A Mathematical Theory of Communication”. It was the culmination of nearly a decade of his work on telecommunication and coding theory. The paper was less than one-hundred pages long, but it laid the foundation for modern communication and in doing so sparked the digital revolution (Gallager, 2001). Seventy years after Shannon’s monumental paper, digital technologies are ubiquitous and their reach is extensive. Over half of the world’s population is connected by the internet and there are more mobile phones in use today than people (Mulcahy, 2017). Since Shannon published his paper the world has changed from analog to digital and this shift has affected every aspect of our lives including even our understanding of basic human rights.

Literacy has been considered a right every person is entitled to since the Universal Declaration of Human Rights, also published in 1948. Originally understood as a set of skills: reading, writing and arithmetic (the three R’s), the focus of literacy programs has been to foster individuals ability for written communication (UNESCO, 2004). However, as the advance of digital technologies have altered communication channels, educators and policy makers have been forced to reevaluate the content of literacy, even calling for new types of literacy such as “digital literacy”, “information literacy”, “statistical literacy” and maybe most often “data literacy” (Bhargava, 2015). In this report, we will attempt to define and understand what it means to be “data literate” or more generally what it means to be “literate” in the Digital Age.

2. Defining Data Literacy:

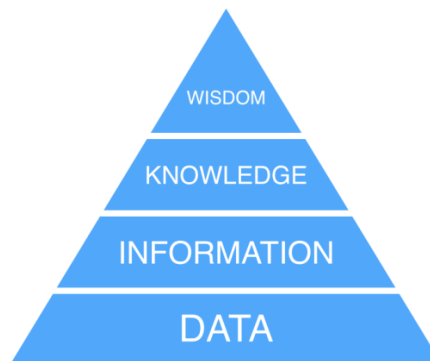
To understand “data literacy” we must first understand and define the terms “data” and “literacy”:

Data are objects and variables that can be identified, created or collected, and recorded and stored. As an individual unit, data has no value beyond its content, but in collections they form information. Data is the base upon which the widely used data-information-

knowledge-wisdom hierarchy (DIKW) is built (Rowley, 2007). Data is the building block or atom of information.

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Russel Ackoff's DIKW Model.

Literacy has been defined in a multiplicity of ways and by a variety of groups (UNESCO, 2004). Yet, despite the numerous interpretations there are some common themes and terms: “ability”, “exchange” and “enable”. “Ability” implies literacy is both a set of skills and the opportunity to use them. Further, it implies literacy is a continuum or spectrum not a binary between literate and illiterate. “Exchange” implies literacy is a bidirectional process of encoding and decoding or writing and reading. “Enable” implies that literacy empowers or amplifies the intent of the literate.

Having examined both “data” and “literacy”, we can now define “data literacy” as the following:

“Data Literacy is the ability to create and exchange information”

Let us unpack this ostensibly simple definition. First, we notice that like literacy, data literacy is an “ability”, which implies both a set of skills and the opportunity to apply them. Next, we notice the verbs “create” and “exchange”. Thus, like literacy, data literacy is a bidirectional process that empowers. Lastly, the subject of both of these verbs is “information”, which we understand as a collection of data. In other words, data literacy is not about the creation and exchange of data, but the creation and exchange of information from and with data. While seemingly a matter of semantics, this nuanced

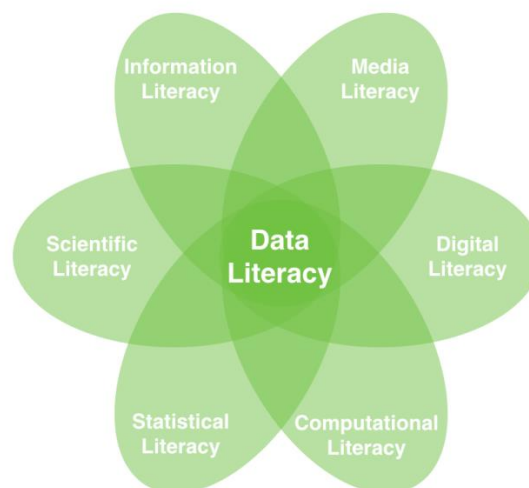
distinction is what distinguishes a data literate person from a computer. Data literacy is not about processing data, but about learning to think and communicate through data.

3. New Literacies:

As mentioned earlier, data literacy is only one of many “new literacies” such as “digital literacy”, “computational literacy”, “statistical literacy”, “scientific literacy”, “information literacy”, and “media literacy” (Bhargava, 2015). It is often difficult to talk about data literacy without also discussing one of these other literacies (Schild, 2004). So how do these new literacies relate to one another?

One interpretation proposed by the Data-Pop Alliance is that data literacy is the intersection of six literacies (Bhargava, 2015). Without attempting to defend or deny this framework or narrowly define the similarities and differences between these literacies, I think this is a valuable model. As we will see, the ability to create and exchange information is a very multifaceted process that spans a broad range disciplines. Understanding data literacy as an intersection of other domain specific literacies is a helpful reminder of this.

Figure 3.1

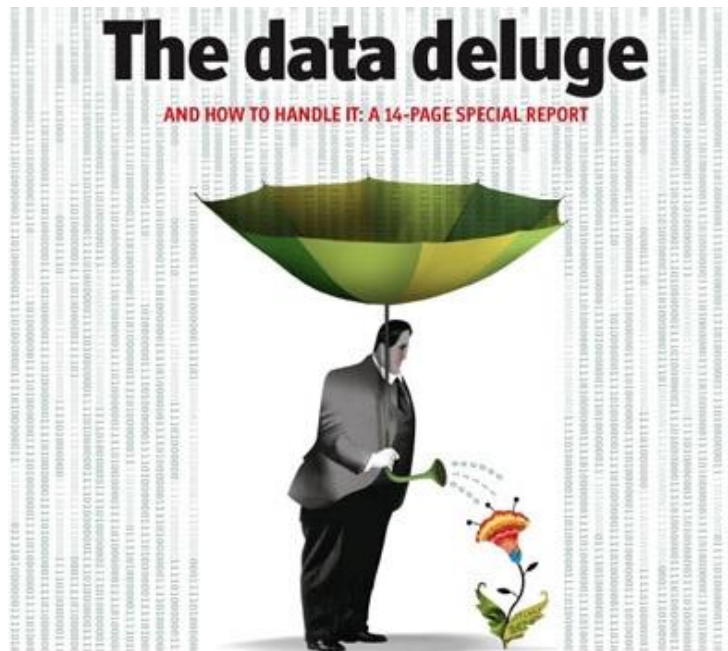


Data-Pop Alliance’s interpretation of data literacy as the intersection of other literacies.

4. The Data Deluge:

In 2017, people generated more data than all of mankind had from the beginning of recorded history to 2010 (Weigend, 2013). Every minute YouTube users upload over forty-eight hours of new video, Twitter reports that nearly 175 million tweets are posted every day and roughly thirty billion pieces of content are shared on Facebook every month. Data is being produced at an unprecedented rate and this growth is not only in size but also source. Sequencing the first human genome took researchers a decade and cost billions of dollars, now it can be accomplished in a week for less than one-millionth of the price (Mulcahy, 2017).

Figure 4.1



The front cover of The Economist February 27th 2010.

Data is getting bigger and bigger and with it, so does the importance of data literacy. A stronger focus on data literacy in primary and secondary education will have the following effect.

1. Data literacy increases and distributes the economic impact of data. Big data is one of the fastest growing economies in the world and is estimated to be a fifty-billion-dollar business in 2017. Employees with data science experience have become highly valued and it is estimated that in the U.S. alone there is nearly a 200,000-person deficit of people with analytical skills (Mulcahy, 2017).

2. Data literacy facilitates local populations solving local problems. Big data is not exclusively global data. Increasingly, more municipalities are using the predictive power of data to cut costs, evaluate the effectiveness of programs and even fight crime (Oceans of Data Institute, 2016).
3. Data literacy enables citizens to keep governments accountable and transparent. Many governments provide open access to a vast array of data from demographics to finance. These datasets have been used to track civil rights violations, detect corruption and generate citizen engagement (Small, 2015).
4. Data literacy expands the inclusivity and diversity around data. The digital divide is a term used to describe the “differential access and ability to use information and communications technologies between individuals, communities and countries – and the resulting socioeconomic and political inequalities” (Bhargava, 2015). Data literacy establishes a bridge across this growing divide.

The current explosive growth of big data industries and influence is only indicative of the its increasing importance to the global climate. Data literacy programs will be essential to preparing the next generation of students for the future economic and social changes.

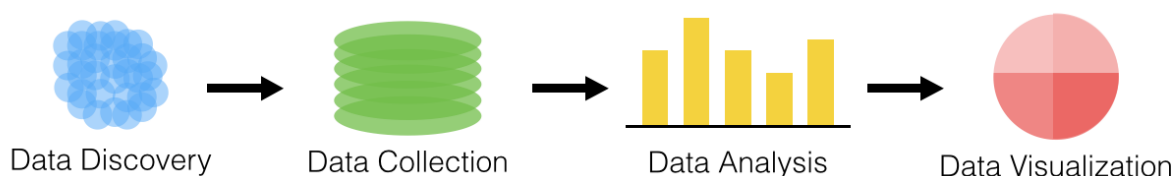
5. The Data Pipeline:

Defining data literacy and its significance, while necessary for this discussion, does not provide specific insight into the content and challenges of a data literacy program. To identify the skills necessary for data literacy we must first understand the underlying challenges of working with data. To do this I will use a workflow proposed by Seed Scientific, a data analytics company based in New York City.

1. Data Discovery – The first step to projects working with data is to identify the source or sources of data. While this may seem trivial, this can be one of the most difficult steps and by nature of being the first step in the “data pipeline”, it dictates all future results. Additionally, because data can contain sensitive and personal information, this step involves thorough consideration of privacy and ownership (Boyd, 2011).
2. Data Collection – After identifying a source of data one must collect, store and maintain the data. There are a variety of methodologies to data collection, which highly depend on the type of data, source of data and size of data. A few of these methods for data collection/creation are direct measurement, experimental observation, simulation, and compilation/aggregation.
3. Data Analysis – Having obtained data the next step is to extract information often with the use of statistical analysis and modelling tools. Over the last century a variety of mathematical tools and models have been developed for this purpose and it is one of the fastest changing domains of data literacy. These tools can broadly be understood as addressing one of the following four challenges: summarize a collection of data, predict future data, infer properties of a data source, and determine causality of the data.

4. Data Visualization – Lastly, sharing these insights involves a mixture of graphical and textual explanations. As stories are becoming increasingly more data focused so are the means of sharing these stories. Infographics, data journalism and interactive explanations have become a few of these channels.

Figure 5.3



The data pipeline as proposed by Seed Scientific.

6. Technical and Non-Technical Skills:

There is no question that working with data necessitates a lot of technical and non-technical skills. Each of the steps in the data pipeline have their own inherent challenges that necessitate a unique set of skills and experience. Many of the technical skills require familiarity with a particular software platform or a specialized programming language. However, recent technologies such as artificial intelligence and virtual reality pose to completely transform the set of technical skills needed to address these challenges (Bhargava, 2015). Additionally, software trends have shown that current platforms may become outdated and replaced by newer technologies. Thus, promoting data literacy must be adaptive and flexible and focus on the challenges of working with data and the non-technical skills used to face them rather than the technical skills used to solve them.

In many ways working with data is an art, not a science. Discovering and collecting data can be more challenging than it seems. And once obtained, there is no one-size-fits-all instruction manual for deciphering your data and extracting information. And even how one communicates this information can be achieved in a multitude of ways. Data literacy is a much broader and interdisciplinary ability than literacy. Often no one person will be completely competent with all steps in the data pipeline and thus must collaborate with others or work outside of their expertise. This environment fosters certain non-technical skills such as teamwork, creativity, patience and risk-taking.

7. Promoting Data Literacy in the Classroom:

To better understand how to promote data literacy in the classroom let us investigate and analyze some case studies in supporting data literacy from around the world.

7.1. Sharing Our Stories:

An essential part of literacy and data literacy is storytelling. The final goal of any data based project is to share an idea or spark a conversation and maybe the greatest challenge of working with data is to find a narrative in the numbers. Two innovative projects from the MIT Media Lab promote data literacy in classrooms through storytelling.

Scratch is a visual programming language where students can program their own interactive stories, games and animations. It also has as an open community where students can share their creations and collaborate with other students from around the world. Scratch is designed for the ages 8 to 16 and used by millions of users in more that 150 countries and in over 40 languages. The unique visual interface promotes problem solving strategies and project design without the technical barriers of a coding environment (Scratch).

City Digits is an experimental curriculum that promotes learning mathematics through social justice data projects. The curriculum uses geospatial data to promote student's exploration of their local environments through data. The initial program was piloted at public school in New York City (Deahl, 2014).

7.2. Compete to Learn:

Competition is an important pedagogical tool used at all levels and domains of education and is an increasingly popular way of getting students involved in data science projects to gain practical experience. A non-profit organization based in the United Kingdom and a start-up company from Australia are using competition in innovative ways to spread data literacy.

Young Rewired State is a non-profit organization founded in 2009 that uses friendly competition to create communities of “digital makers” aged 18 and under. The organization plans competitions and events for young developers and designers to produce digital products and learn from one another. They hold events in the United Kingdom, Germany, Singapore, United States and Kosovo. Since their founding they have grown from a community of 50 programmers to well over 1000 (Deahl, 2014).

Kaggle is a platform for predictive modelling founded in Melbourne, Australia in 2010. The platform allows researchers and companies to post data sets and users compete to produce models that best predict and describe the data. Kaggle has over 500,000 registered users from over the 190 countries and is claimed to be the largest and most diverse data community in the world. In addition to their public competitions, Kaggle offers a free tool for educators to use in their classroom (Kaggle, 2017).

7.3. Explorable Explanations:

Education is quickly becoming more internet based. While online teaching resources cannot replace the importance of face-to-face instruction, they can be valuable supplements. Two groups, one from the United States and the other from Singapore, are taking advantage of the popularity and interactivity of the web to create free interactive teaching tools that promote data literacy.

Seeing Theory is an online platform for learning probability and statistics through explorable concept visualizations. The platform consists of fifteen unique visualizations covering an introductory course in statistics. Visualizations range from flipping a biased coin to investigating correlation in famous datasets. The platform is entirely free with users from nearly every country in the world. The developers are currently in the process of producing a companion text that can be used in classrooms (Seeing Theory).

Visualgo is an online platform for learning data structures and algorithms covered in an introductory computer science course. The platform was developed by a group at the National University of Singapore to help students learn on their own and at their own pace. The platform has over twenty units and has been translated into over ten languages (Visualgo).

8. Data Literacy and Education 2030:

When Claude E. Shannon published his historic paper on communication, he unknowingly sparked a digital revolution which changed our world and our understanding of literacy. In this paper we examined “data literacy” and defined it as the ability to create and exchange information. We contextualized data literacy in the age of big data and its growing importance and influence. We discussed the challenges of working with data and the technical and non-technical skills needed to address them. And finally, we investigated specific case studies promoting data literacy through a diverse range of strategies. Data literacy is increasingly essential to navigating our digital world and must be a foundational skill of Education 2030.

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BC's Redesigned Curriculum - Theoretical Underpinnings

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1. Introduction

British Columbia's curriculum is being redesigned to respond to the demanding world our students are entering.

In 2011, the Learning Division of the Ministry organized Curriculum and Assessment together in one Branch, under one leader and this has facilitated all of the work to date. Both curriculum and assessment were a consideration throughout the development; however, attention first was given to the redesign of curriculum. During this time some shifts began to happen to the provincial assessment and reporting program (i.e., alignment of curriculum and assessment began at the outset of the development). The references attached include key curriculum references but also include a number of assessment-related references that were reviewed.

The process for curriculum development in BC has been key to the redesign. Teacher teams were encouraged to discuss and share what they were doing with other colleagues and garner ideas to bring back to the team for discussions. As well, draft curriculum documents were posted on the website several times for review and feedback by anyone who viewed the site. Valuable information was received and used to revise and improve the curriculum. All of this spoke to the openness and transparency of the process and helped buy-in and ownership.

To develop new models of curriculum, the Ministry consulted with experts in the field (e.g., provincial and international educational authorities, researchers, other jurisdictions, BC teachers and BC stakeholders in education). In summary, they recommended that to prepare students for the future, the curriculum must be learner-centred, flexible and maintain a focus on literacy and numeracy, while supporting deeper learning through concept-based and competency-driven approaches.

BC has an image of the Educated Citizen that provided focus for the work. Achieving British Columbia's social and economic goals requires well-educated citizens who are able to think critically and creatively and adapt to change. Progress toward the achievement of these goals also depends on the province having citizens who accept the tolerant and multifaceted nature of Canadian society and who are motivated to participate actively in our democratic institutions. All curricular areas of learning contribute to the

development of educated citizens. The redesigned curriculum captures these qualities, both implicitly and explicitly, in the core and curricular competencies.

The redesign of curriculum maintains a focus on sound foundations of literacy and numeracy while supporting the development of citizens who are capable thinkers and communicators, and who are personally and socially competent in all areas of their lives. British Columbia's redesigned curriculum honours the ways in which students think, learn, and grow, and prepares them for a successful lifetime of learning where ongoing change is constant.

2. Curriculum Redesign Principles

Many discussions and consultations led to the development of a set of principles for the redesign of provincial curricula. These principles called for a curriculum which supports the development of educated citizens, is inclusive, and is concept-based and competency-driven:

- Ensure Core Competencies are explicitly considered in the renewed curriculum to support deeper learning and the transfer of key skills and processes to new contexts.
- Give close attention to the important concepts and big ideas in each area of learning to support the application and transfer of essential learning.
- Limit the amount of prescription while ensuring a solid focus on essential learning.
- Stress higher order learning, giving emphasis to the key concepts and enduring understandings (big ideas) that students need to succeed in their education and their lives.
- Allow for flexibility and choice for teachers and students.
- Respect the inherent logic and unique nature of the disciplines while supporting interdisciplinary approaches.
- Integrate and embed First Peoples Principles of Learning and Aboriginal knowledge and worldviews.
- Align assessment and evaluation with the redesign of the curriculum.

These principles have guided the work since 2011 and they now are providing a foundation to a set of assessment goals and principles.

One of the principles for BC's curriculum redesign was that the renewed curriculum should support both disciplinary and interdisciplinary approaches. This has been a natural tension throughout the work. It was recognized that bodies of "knowledge" exist within areas (such as science), but that these frameworks should also support interdisciplinary learning. In fact, this suggests one cannot have interdisciplinary learning without disciplinary frames; that is interdisciplinary approaches stem from disciplinary bodies of "knowledge". The role of disciplinary bodies of knowledge will undoubtedly evolve in the future.

3. Core Competencies

In BC, Core Competencies are defined as the intellectual, personal, and social and emotional proficiencies that all students need to develop in order to engage in deep learning and life-long learning. They are directly related to the educated citizen and as such are what we value for all students in the system.

Through provincial consultation, three broad core competencies were identified: communication; thinking; and personal and social competence. These three broad categories consist of six sub-domains noted below.

3.1. Communication

Communication encompasses the set of abilities that students use to acquire, impart, and exchange information, experiences and ideas; to connect, engage, and collaborate with others; to recount and reflect on their experiences and learning; and to understand and effectively engage in the use of digital media.

3.2. Thinking

Creative Thinking involves the generation of new ideas and concepts that have value to the individual or others, and the development of these ideas and concepts from thought to reality.

Critical Thinking involves the analysis and evaluation of thinking in order to improve and extend it, and includes systematically examining thinking about information that comes to them through observation, experience, and various forms of communication.

3.3. Personal and Social Competence

Positive Personal and Cultural Identity involves the awareness, understanding, and appreciation of all the facets that contribute to a healthy sense of oneself. It includes awareness and understanding of one's family background, heritage(s), language(s), beliefs, and perspective, and sense of place.

Social awareness and responsibility involves ability and predisposition to cooperate and collaborate with others, display community-mindedness and stewardship, empathize with and appreciate the perspective of others, and create and maintain healthy relationships within one's family, community, society, and environment.

Personal awareness and responsibility involves developing all aspects of personal well-being; making ethical decisions and taking responsibility for one's actions and how they impact self and others; and self-regulation.

Since they were considered foundational to all the work, the development of core competencies was the first priority within the curriculum renewal. Over twenty school district teams of 10-20 educators worked on each of the sub domains, bringing student work to the table to begin the articulation of how these important skills grow over time. The process of development included discussions with Aboriginal leaders in the province who gave advice to their construct and, as well, individual Aboriginal educators participated in their development.

The resulting core competency profile descriptions and illustrations are not tied to grade levels but they describe larger stages of development, consisting of only 5-8 levels depending on the area. They core competency profiles are inclusive of all learners and depict very early stages of growth through to sophisticated proficiency.

Information on the Core Competencies, including profiles and illustrations, are available at www.curriculum.gov.bc.ca/competencies.

4. Core Competencies in the Curriculum

As noted, the development of core competencies was a priority within the curriculum renewal work as they underpin the curricular competencies in all areas of learning. The core competencies were used by all the curriculum teams as part of the frame for the curriculum development process. Each team considered how their subject area contributed to the development of the core competencies. This ensured that they were naturally built into the learning standards in each curricular area.

The core competencies are evident in every area of learning; however, they manifest themselves uniquely in each discipline. They are enacted through “the doing” portion of each curriculum. For example, thinking and communication will be found in all curricular areas within the curricular competencies. See Appendix 1 for an example in science.

There is no one to one relationship between core and curricular competencies, but core competencies are instead embedded into the deep structure of all curricula and there are many opportunities for teachers to create learning experiences to ensure they are addressing the core competencies.

Students in BC are now also required to self-assess once a year on their progress on core competencies, providing evidence from their documented work. The intent is that students are taking ownership over their learning and are active in the learning process.

5. Aboriginal perspectives and knowledge

British Columbia has long had the goal of improving school success for all Aboriginal students. Achieving this goal will require that the voice of Aboriginal people be heard in all aspects of the education system; the presence of Aboriginal languages, cultures, and histories be increased in provincial curricula; and leadership and informed practice be provided.

At the same time, Aboriginal perspectives and knowledge are a part of the historical and contemporary foundation of British Columbia and Canada. British Columbia's education transformation therefore incorporates the Aboriginal voice and perspective by having Aboriginal expertise at all levels, ensuring that Aboriginal content is a part of the learning journey for *all* students, and ensuring that the best information guides the work. An important goal in integrating Aboriginal perspectives into curricula is to ensure that all learners have opportunities to understand and respect their own cultural heritage as well as that of others.

Over the past decade, British Columbia's curriculum has integrated Aboriginal content into specific courses. The redesigned curriculum builds on what has been learned and extends Aboriginal perspectives into the entire learning journey, rather than into specific courses or grade levels. This means that from Kindergarten to graduation, students will experience Aboriginal perspectives and knowledge as part of what they are learning. And because Aboriginal perspectives and knowledge are embedded in the curriculum, they will naturally influence the ways in which students will be assessed.

The **First Peoples Principles of Learning** provided a crucial lens for teacher teams when drafting curricula and all curriculum teams included Aboriginal representation. The teams put great effort into embedding Aboriginal knowledge and worldviews in curriculum in authentic and meaningful ways. Curriculum material was reviewed by Ministry staff as well as by Aboriginal teachers and other experts.

References to Aboriginal perspectives and knowledge are both explicit and implicit in the redesigned curriculum and are evident in the rationale statements, goals, learning standards, and some of the elaborations. Rich instructional samples to inspire teaching and learning will be collected and shared online to provide examples of relevant teaching units and place-based learning. In all of the areas of learning, teachers are encouraged to teach in ways that respect the place in which the students are – to teach from within the school and its surrounding community.

The inclusion of Aboriginal perspectives and knowledge specifically in the Guiding Principles for New Curriculum is based on the understanding that Aboriginal perspectives and knowledge are a part of the historical and contemporary foundation of BC and Canada. The integration of Aboriginal perspectives and knowledge in the curriculum serves to understand Aboriginal cultures. With a more in-depth knowledge of Aboriginal people and their history, all students in British Columbia will have a foundation for developing mutual understanding and respect.

The First Peoples Principles of Learning are affirmed within First Peoples communities and are being reflected in the development of all K-12 curriculum and assessment. The First Peoples Principles of Learning generally reflect First Peoples pedagogy. The term “First Peoples” includes First Nations, Métis, and Inuit peoples in Canada, as well as indigenous peoples around the world.

First Peoples Principles of Learning

- Learning ultimately supports the well-being of the self, the family, the community, the land, the spirits, and the ancestors.
- Learning is holistic, reflexive, reflective, experiential, and relational (focused on connectedness, on reciprocal relationships, and a sense of place).
- Learning involves recognizing the consequences of one's actions.
- Learning involves generational roles and responsibilities.

- Learning recognizes the role of indigenous knowledge.
- Learning is embedded in memory, history, and story.
- Learning involves patience and time.
- Learning requires exploration of one's identity.
- Learning involves recognizing that some knowledge is sacred and only shared with permission and/or in certain situations.

See: http://www.bced.gov.bc.ca/abed/principles_of_learning.pdf and
https://curriculum.gov.bc.ca/sites/curriculum.gov.bc.ca/files/pdf/aboriginal_education_bc.pdf

6. Concept-based, competency-driven curriculum

British Columbia's redesigned curriculum brings together two features that most educators agree are essential for 21st-century learning: a concept-based approach to learning and a focus on the development of competencies, to foster deeper, more transferable learning. These approaches complement each other because of their common focus on active engagement of students.

Deeper learning is better achieved through "doing" than through passive listening or reading. Similarly, both concept-based learning and the development of competencies engage students in authentic tasks that connect learning to the real world.

6.1. Concept-based learning

Concept-based learning is an approach to curriculum that emphasizes understanding. Educators and cognitive psychologists have promoted the value of concept-based learning for much of the last century, starting with Piaget's cognitive theory, which viewed concepts as the building blocks of learning (1936). Other influential thinkers who have explored the crucial role of concept development in learning include Taba, Bruner, Novak, and Ausubel, to name a few. (Refer to the references.)

If the goal of curriculum is to foster the higher-order thinking demanded in today's world, concept-based learning presents several advantages over traditional fact-based approaches to learning.

- Concepts enable students to incorporate new facts into their existing knowledge, thereby providing conceptual scaffolding for greater understanding.
- Concepts are transferable to new contexts.
- Concepts strengthen students' understanding of the connections between areas of study.

- Concepts form a conceptual web that enables higher-order thinking and greater sophistication in analyzing, problem solving, and creating new knowledge.

A concept-based curriculum uses concepts to define standards of knowledge and skills associated with a given area of learning. It is focused on the key concepts, principles, and generalizations that are used to organize knowledge and solve problems within and across disciplines.

A concept-based curriculum:

- is built around higher-order standards and key ideas, allowing a more in-depth exploration of topics to gain deeper understanding
- balances the study of factual information with the development of conceptual understanding and disciplinary skills
- offers opportunities for the transfer of learning
- is not a list of topics to cover in isolation from one another.

A concept-based curriculum allows for connections between big ideas — for example, through exploration of the concept of reoccurring patterns and comparison of how patterns appear in literature, geographical features, and the evolution of species.

As assessment becomes aligned with curriculum, this conceptually-based curriculum will cause shifts in methods of assessment.

6.2. Competency-driven learning

In the context of education, competency-driven learning is the ability of students to participate successfully in a task. That ability represents a combination of skills, strategies and processes. Students are competent in an area of study to the extent that they understand and can apply knowledge to new contexts.

Competencies are often narrowly equated with skills, but in a 21st century educational context, competencies represent a much broader and more adaptable achievement than a simple set of skills. A focus on skills development misses other crucial abilities that students need as citizens and lifelong learners, which "have future-focused and dispositional components." The broader view of competencies as the "participatory pathway," which challenges students "to *use* knowledge, not just *get* it." [Hipkins (2012)] It is through the "doing" within and across the areas of learning that students become active participants in building competency, fostering engagement in the process, as they see the real-world applications of their understanding.

Following these directions and changes in curricular emphasis, assessment now gives increased attention to the "doing" aspects of the learning. We will see these shifts in assessment towards an emphasis on competencies and skills both in provincial large-scale assessments and assessment and reporting practices in the classroom.

7. The Role of Concepts in BC Curriculum

BC's concept-based curriculum is built on the work of Lynn Erickson, Jay McTigue, Grant Wiggins, Edmund Hansen, Carol Tomlinson, Hilda Taba and Yoram Harpaz. BC did not follow any one authority, but rather curriculum development was based on a synthesis of views of various authorities, local experts, and examples of excellent practices and views of BC teachers.

A question that arises in discussions of the new curriculum model is concerned with how explicitly concepts should be specified in the curriculum. The answer requires consideration of the nature of concepts and of conceptual learning.

“An individual understands a concept, skill, theory or domain of knowledge to the extent that he or she can apply it appropriately in a new situation.”
Gardner, *The Disciplined Mind* (NY, 1999)

In their most basic sense, concepts are simply ideas or thoughts; to think is to use concepts, the abstract, mental representations of the concrete world. The role of concepts is to support deep understanding. As Yoram Harpaz describes, to understand a concept is to relate it to other concepts and to be able to perform intellectual moves with it. The process of building conceptual schemas, the web-like systems of ideas into which new learning is incorporated occurs as students encounter new knowledge, in the form of disciplinary facts and topics, and have opportunities to manipulate and explore it. It is through frequent experiences in a variety of contexts that concepts develop. As such, concepts must be woven into the whole fabric of the curriculum. At the same time, the choice of concepts and the learning activities needed to activate them relies on the professional judgment of the classroom teacher.

Some concepts are clearly implicit and are developed through inquiries and other learning activities that bring together content and processes. These are the concepts that Elder and Paul describe as “being everywhere”; they develop as students explore facts and topics through a variety of thinking processes. In the B.C. KDU model, implicit concepts are found within all three parts of the curriculum:

Concepts within content learning standards

The topics defined as required content (knowledge) in each curriculum identify the subject matter that students are expected to know. Topics may be concepts or they may be instantiations of concepts. For example, *evolution* is a topic that is also a concept; *Homo sapiens* is a topic but not a concept. However, in exploring *Homo sapiens* and other examples of evolution, students have the opportunity to expand their understanding of the concept of evolution. The topics *natural resources* and *the Canadian fur trade* show a similar relationship between concept and example.

Concepts within curricular competency learning standards

The processes defined as curricular competencies support the development of implicit concepts in two ways: they provide the opportunities for students to develop the process-based concepts that Lanning defines as arising from the application of skills and strategies; and they provide opportunities for students to practise the “intellectual moves”

that Harpaz identifies as the evidence of conceptual understanding. In neither case is it necessary to make the concepts explicit.

Concepts within big ideas

As generalizations, big ideas are conceptual in nature: when students discover or reach the understanding expressed in a big idea, they have achieved transferable understanding—the overall goal of a concept-based curriculum. The concepts relevant to big ideas may be implied rather than explicit. However, they should be made explicit in the elaborations of Big Ideas.

Other concepts, especially disciplinary-specific concepts, need to be made explicit. Land and Mayer refer to these as “threshold concepts,” concepts that, once understood, bring learners to a deeper and broader understanding of a discipline. These are similar to what Erickson (2007) refers to as “micro-concepts,” which lead to deep, discipline-specific understanding. She contrasts these with “macro-concepts,” which are broad in scope and allow for cross-disciplinary understanding. Both are essential in a concept-based curriculum.

Definitions Relevant to Concepts in BC Curricula

Concepts: In their most basic sense, concepts are simply ideas or thoughts; to think is to use concepts. Those concepts essential for understanding a particular discipline are generally identified in provincial curricula – sometimes categorized as essential vocabulary and sometimes identified as concepts or key concepts.

Concept Development: How students’ ideas (concepts) develop over time is central to instructional and assessment designing. It is through frequent experiences in a variety of contexts that students develop concepts. As such, concepts are woven into the whole fabric of the curriculum. Concept development is seldom linear and may be represented best by concept maps as in the Science Literacy Maps developed by AAAS Project 2061: <http://strandmaps.dls.ucar.edu/> In this site, the tutorial videos provide ideas about how student understanding typically progresses. In BC, curriculum coordinators have investigated how particular concepts develop in their area of learning, for example, see: [Development of the Concept of Identity in Arts Education and ELA curricula](#) and [Big Ideas Continuum in Science](#)

Key Concepts: Key concepts are those discipline-specific concepts identified by curriculum developers (Curriculum Teams) to be the essential concepts/ideas required for the development of understanding within each particular area of learning.

Crosscutting Concepts: To date, most of the work on crosscutting concepts has been in the area of science education and only crossing the disciplines of science. However, work in BC suggests that the concept of *crosscutting* could be applied generally to all areas of learning. We can look at crosscutting concepts in two ways.

- *Crosscutting concepts have application across the disciplines that compose a single area of learning.* For example in BC, science curriculum is composed of the disciplines of biology, chemistry, physics and earth/space sciences. The table titled, [Interdisciplinary Science Concepts](#), illustrates that there are two levels of concepts to consider – those that are discipline-specific (e.g., physics or chemistry) and those

- that cut across the set of disciplines (e.g., physics, chemistry, biology and earth/space science).
- *Crosscutting concepts can also provide links across several areas of learning.* As shown in the table, Concepts Within Curriculum, some concepts cut across some or all of areas of learning. These are also called macro concepts.

8. Future Development of Cross-cutting Concepts

BC's recent curriculum renewal work was unprecedented in that all areas of learning from Kindergarten through to grade 12 were worked on in one time period. Due to the schedule and vast scope of the work, it did not permit full investigation of cross-cutting (or macro) concepts. Because the work was conceptually focussed, we know that concepts exist throughout curricula and in all components of each area of learning.

Some initial investigation occurred regarding the existence of macro or cross cutting concepts (see Appendix 2). It was also noted that while macro concepts do exist (e.g., change, systems), they do vary slightly in orientation depending on the focus of the area of learning. With some further work macro concepts could be identified and explicitly noted. This would facilitate teachers to make connections across subject areas and help them in their planning of learning activities.

9. BC's Know-Do-Understand (KDU) Curriculum Model

The curriculum for each area of learning in BC is presented by grades and in the form of learning standards (content and curricular competency) and big ideas. Together, the learning standards and big ideas define what students are expected to know, understand, and be able to do in each grade and area of learning.

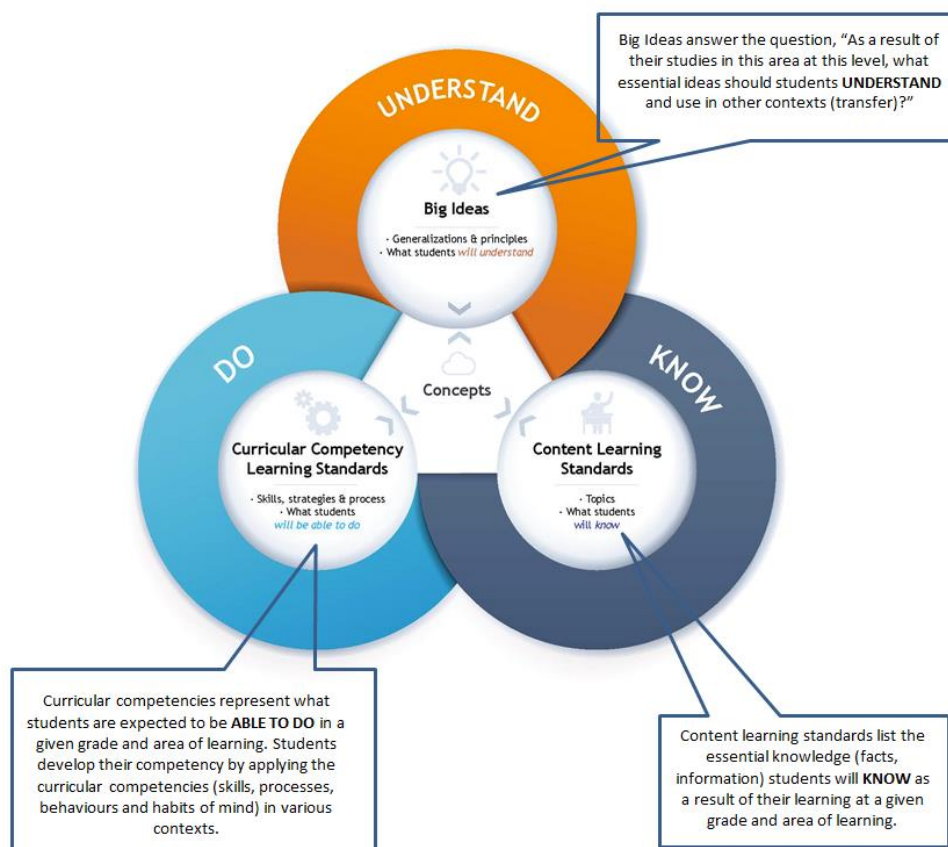
Learning standards and big ideas, along with the core competencies, provide the basis for teachers to plan learning experiences, teach, assess and communicate about student learning.

The balance between content learning standards and curricular competency learning standards will differ depending on the area of learning. Areas of learning that emphasize skills, strategies and processes, such as language arts and arts education, may be more heavily weighted toward curricular competencies than content. BC's new curriculum consists of three elements:

- content learning standards = what students are expected to **know**

- curricular competency learning standards = what students are expected to **be able to do**
- big ideas = what students are expected to **understand**

Figure 9.1.



All areas of learning are based on the "Know-Do-Understand" model to support a concept-based competency-driven approach to learning and all areas of learning have been redesigned using this model. Three elements, the Content (Know), Curricular Competencies (Do), and Big Ideas (Understand) all work together to support deeper learning.

9.1. Content and Curricular Competencies

The Content learning standards - the "Know" of the Know-Do-Understand model of learning - detail the essential topics and knowledge at each grade level. The Curricular Competencies – the skills and process of the area of learning - reflect the "Do" in the Know-Do-Understand model of learning. While Curricular Competencies are more subject-specific, they are connected to the Core Competencies.

9.2. Big Ideas

The Big Ideas consist of generalizations and principles and the key concepts important in an area of learning. They reflect the "Understand" component of the Know-Do-Understand model of learning. The big ideas represent what students will understand at the completion of the curriculum for their grade. They are intended to endure beyond a single grade and contribute to future understanding.

10. Big ideas and how they work

Big ideas represent what students are expected to understand as a result of their learning in a given grade and area of learning. They are the generalizations and principles that students can discover in the "doing of" the specific area of learning.

- The set of big ideas for an area of learning reflect the goals of the curriculum and the developmental sequence of students' understanding in that area of learning.
- Big ideas represent the conceptual level of the curriculum. They raise the two-dimensional model of knowledge and process to the three-dimensional model of knowledge, process, and understanding.
- Big ideas answer the question, "As a result of their studies in this area at this level, what essential ideas should students understand?"

Big ideas are defined by these characteristics:

- they are transferable to new contexts
- they can be inferred or discovered through inquiry and other learning activities
- they are supported by the knowledge and processes introduced in a given curriculum

Big ideas provide a focus for instructional planning. They give teachers flexibility in designing activities that bring together mandated content (what students will know) and processes (what students will be able to do) in ways that support students' understanding (what students will understand).

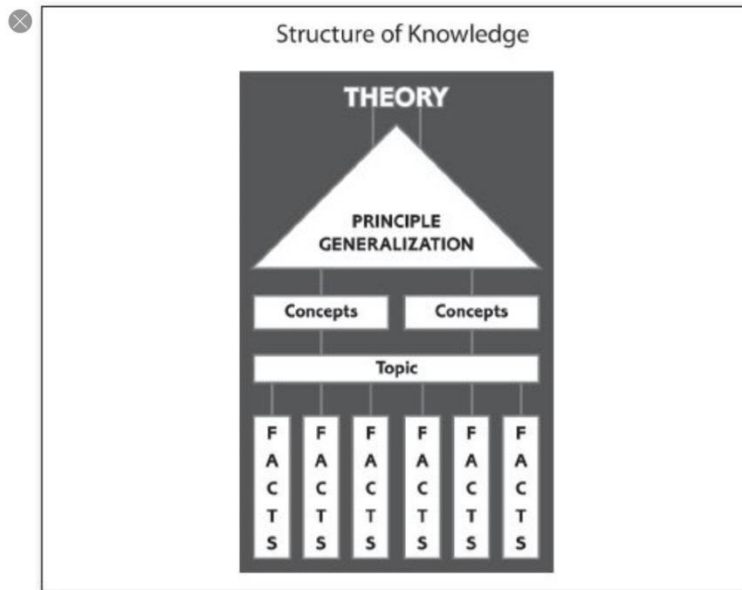
Big ideas can be used as a basis to develop personalized learning or combined with big ideas from other subject areas to create integrated units. Big ideas, therefore, can support interdisciplinary approaches to teaching and learning.

10.1. Background to the KDU (or KUD) Model

BC's know-do-understand model draws from those curriculum designers who propose KUD models of learning, including Lynn Erickson, Lois Lanning, Jay McTigue, Grant Wiggins, Edmund Hansen, and, most influential, Carol Tomlinson. According to Tomlinson, one of the characteristics of a high quality curriculum is the presence of clear KUDs.

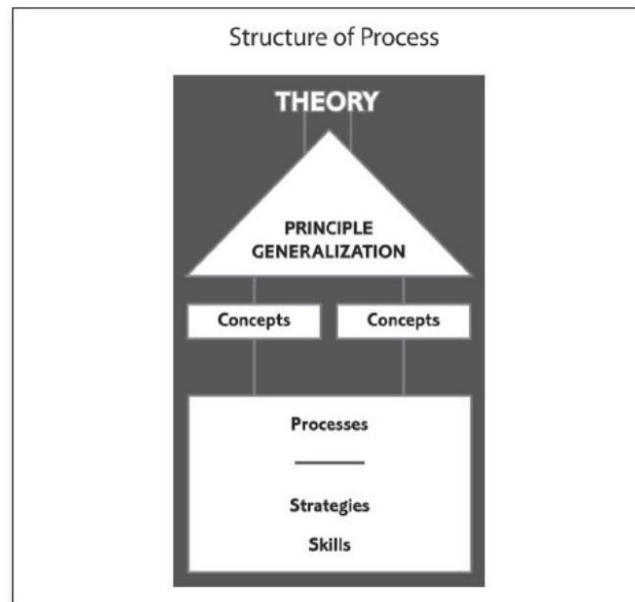
Knowing how knowledge is structured in each subject is a prerequisite to developing curriculum for that area of learning. To develop a concept-based curriculum, BC consulted with Lynn Erickson, whose model was influential in the development of the initial B.C. curriculum drafts. Erickson's model of the structure of knowledge (illustrated below) shows how topics and facts support conceptual learning and lead to generalizations, principles and theories, or big ideas.

Figure 10.1.



Building on Erickson's model, Lois Lanning proposed a similar structure of process, which she argues is also conceptual in nature. Paralleling the structure of knowledge, her structure (illustrated below) of process has skills, strategies, and processes supporting concepts and leading to generalizations, or big ideas, about the nature of processes in a given discipline. (See Lanning, *Designing a Concept-Based Curriculum for English Language Arts*, 2012.)

Figure 10.2.



In these models, both structures lead to an understanding of the nature of knowledge and the nature of process—the enduring, transferable understandings that students need if they are to be ready to adapt to the ever-changing and expanding contexts for learning that today's students need to embrace.

Most recently, Erickson and Lanning have clarified how content and process work together in a model they call "KUD" (Know, Understand, and be able to Do). (See Erickson and Lanning, *Transitioning to Concept-Based Curriculum and Instruction: How to Bring Content and Process Together*, 2014.) The KUD model is what they refer to as a three-dimensional model of curriculum; unlike conventional, two-dimensional models that emphasize what students will know and be able to do, the three-dimensional model introduces the third level of learning, understanding—the enduring, conceptual learning that goes beyond learning facts and skills alone.

The shift from a two- to a three-dimensional model is what Erickson and Lanning describe as “shifting the focus from *covering* facts and skills to *using* facts and skills to understand concepts and conceptual understandings”.

10.2. Curriculum Redesign Approaches

The following describe two approaches that curriculum developers might use in designing curriculum—a holistic approach or a bottom-up approach. Both approaches were utilized in BC and curriculum teams considered what worked best in their context. Each curriculum team used one approach or the other; in some instances, teams used a combination of the two processes.

10.2.1. Holistic Approach

In a holistic approach, the initial focus is to identify what teacher's value in the area of learning. Then the effort moves to the development of a schema for a three-dimensional curriculum. This approach may be most useful in the initial round of curriculum development, when curriculum writers are first learning about the structure of a curriculum.

The following is a description of work done by the Curriculum Team as they developed the Core French curriculum:

Figure 10.3



Note: Teachers identified and wrote on post-it notes what they wanted students to learn in core French (i.e., know, understand and be able to do). Later, they sorted their statements on a wall with strings separating Understand, Know, and Do categories. Then, they discussed items in each category using definitions provided, moving or editing those that they felt were not categorized correctly.

No matter which approach is used to start, attention needs to be given to the content standards in each grade in order to clearly articulate the big ideas as generalizations that are unique in each grade. Big ideas are what students discover or reach through the “doing of” the area of learning as they pair content with processes to lead to conceptual understanding.

10.2.2. Bottom-Up Approach

Erickson and Lanning propose that content be used to drive the development process. They explain the power of their “bottom-up” model in this way:

Educators sometimes question this bottom-up approach and state that they instead start with a “big idea” and then identify their supporting content ... [but] the bottom-up strategy produces greater clarity and power in the conceptual

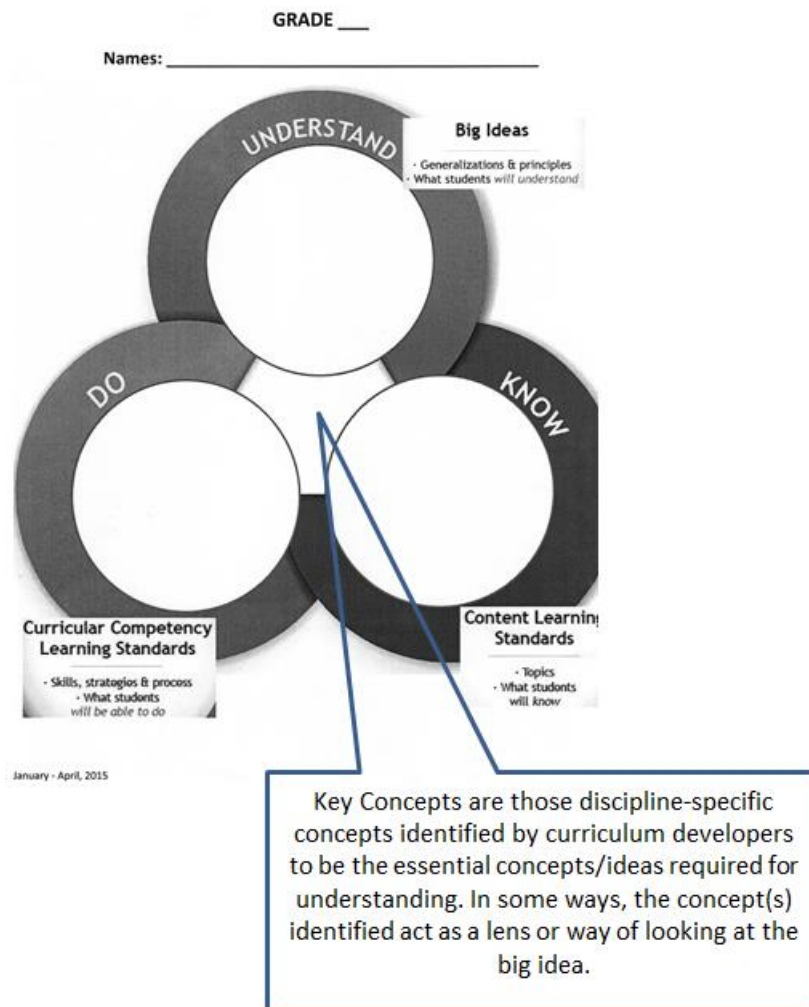
statements. Teachers are required to teach defined content so it just makes sense to start with the required topics and skills and then draw out the concepts.

Adopting this bottom-up approach as part of the curriculum revisions could also help address the three needed changes noted above as follows:

- Content would be clearly defined as the topics and facts students are expected to know at a given grade level in a given area of learning; concepts would no longer be part of the content standards
- The curricular competencies (skills and processes) would define what students will be expected to do in the area of learning in applying the mandated content through inquiry and other activities; curricular competencies are thus seen as the processes, and not the skills objectives, that can be paired with content to lead to the generalizations specified in the big ideas. This model enables teachers to choose the pairing of content and process, thereby ensuring them greater flexibility in classroom instruction
- The big ideas can be seen more clearly as the generalizations that students discover or reach through the “doing of” the area of learning as they pair content with processes to lead to conceptual understanding.

Each curriculum team determined ways to test the connections among key concepts and the three elements: big ideas, curricular competencies and content. Using formats such as the following assisted in clarifying the connections among the three elements and the key concept(s).

Figure 10.4.



11. The Role of Epistemic Knowledge

Epistemic knowledge is a foundational backdrop to each area of learning and the curricular competencies are where these attributes are manifested and expected to be developed in students.

The curriculum rationale for each area of learning is a statement that explains why the area of learning is part of the BC curriculum and includes the importance of the area of learning to students themselves (benefits to students – i.e., values and habits of mind that develop such as thinking like a scientist or a historian). It is here that the role of

epistemic knowledge is articulated and it is through the curricular competencies that the learning standards are relevant. For example:

11.1. Arts Education

- The redesigned Arts Education curriculum reflects the following artistic habits of mind
 - Exploring with artistic curiosity
 - Creating with artistic intellect
 - Reasoning through considerations and possibilities
 - Reflecting on choices and imagining opportunities
 - Communicating ideas and perspectives
 - Documenting artistic growth and understandings
 - Connecting with themselves, artists, artworks, and the world
 - Expanding artistic capacity through perseverance
- Curricular Competency learning standards are structured around the following curricular organizers.
 - Exploring and creating
 - Reasoning and reflecting
 - Communicating and documenting

11.2. Science

- Scientific habits of mind are important for equipping students with the thinking skills necessary for engaging in the pursuit of discovery and innovation, as well as for understanding science. In addition, when students approach learning with scientific habits of mind, science learning is exciting and includes a knowledge base that is constantly refined and expanded and is relevant to the modern world. Developing scientific habits of mind provides students with the thinking skills to effectively participate in society as scientifically educated citizens and invites them to explore further studies in science. Scientific habits of mind include:
 - A sustained intellectual curiosity — the desire to continually learn more about something of interest
 - An openness to new ideas and consideration of alternatives — an attitude of wonder and interest in new concepts, coupled with a willingness to rethink notions and form new opinions based on evidence
 - An appreciation of evidence — an understanding of what proves or disproves a scientific theory
 - An awareness of assumptions and a questioning of givens — mindful questioning about something accepted as true without evidence
 - A healthy, informed scepticism — challenging the truth of a claim by requiring additional evidence
 - A desire to seek patterns, connections, and understanding — the ability to make connections in information and interpret meaning from the patterns

- A consideration of social, ethical, and environmental implications — a willingness to think about personal, societal, moral, and environmental impacts of actions
- Curricular Competency learning standards are structured around the following curricular organizers.
 - Questioning and Predicting
 - Planning and Conducting
 - Processing and analysing data and information
 - Evaluating
 - Applying and innovating
 - Communicating

11.3. Mathematics

- Mathematical values and habits of mind go beyond numbers and symbols: they help us connect, create, communicate, visualize, reason, and solve. Using mathematical thinking allows us to analyse novel and complex problems from a variety of perspectives, consider possible solutions, and evaluate the effectiveness of solutions. When developed early in life, these habits of mind generate confidence in our ability to solve everyday problems without doubt or fear of math. Students who have developed mathematics habits of mind exhibit expertise in:
 - persevering and using mathematics to solve problems in everyday life
 - recognizing there are multiple ways to solve a problem
 - demonstrating respect for diversity in approaches to solving problems
 - choosing and using appropriate strategies and tools
 - pursuing accuracy in problem solving
- Curricular Competency learning standards are structured around the following curricular organizers.
 - Reasoning and analysing
 - Understanding and solving
 - Communicating and representing
 - Connecting and reflecting

11.4. Social Studies

- In social studies there is now a greater emphasis on acquiring and developing key disciplinary thinking skills (e.g., thinking like a historian). These skills are built around six major historical and geographical thinking concepts:
 - Significance
 - Evidence
 - Continuity and change
 - Cause and consequence
 - Perspective
 - Ethical judgment

12. The Role of Procedural Knowledge

There is a relationship between epistemic knowledge and procedural knowledge as both involve active involvement in learning. With the emphasis towards competencies, all areas of learning have a greater focus on “the doing”. The curricular competency learning standards in each curriculum include the procedural knowledge for that subject area. They are the key skills and processes of the area of learning.

Also, as part of the introduction to each curricular area, information is provided that describes how place-based, applied, and experiential learning are manifested in the subject area.

Examples of procedural knowledge provided by OECD 2030, such as design thinking and system thinking, are found in the Applied Design, Skills, and Technologies (ADST) curriculum. The ADST curriculum has been seen as somewhat of a catalyst for change in BC and it is an area that integrates well with other areas of learning. In fact, at grades K-5 the competencies must be applied with content in other curricular areas with the intent that students will develop foundational mind-sets and skills in design thinking and making. The competencies of design thinking as articulated in ADST include: understanding context, defining, ideating, prototyping, testing, making and sharing/reflecting on design thinking and processes.

13. Summary

BC’s curriculum is based on a conceptual “theory of knowledge” model, with an emphasis on curricular competencies. It is considered a Know-Do-Understand model or a three dimensional model of curriculum.

BC’s redesigned curriculum supports inquiry based models, place-based learning, and has an emphasis on applied, experiential learning or “the doing”.

BC’s model recognizes that both disciplinary and interdisciplinary approaches are important and it enables both. Teachers in BC own the methodology (the how), whereas the province sets out the standards (the what). The curriculum design principles and resulting curriculum model also imply that interdisciplinary approaches can only come from having disciplinary models to start from. The difference however, is that BC’s disciplinary-focused curriculum has been lifted to a conceptual level.

BC’s curriculum has been well received by teachers particularly when they realize the freedom it brings to teaching and learning.

One area of untapped potential is the explicit identification of concepts to help teachers see and make connections across curricular areas. Some work has been started but has not been completed (see attached Appendix 2). Future curriculum design could start from

a distillation of the key cross-cutting concepts across all areas of learning, forming a frame for curriculum and assessment development.

Work now occurring in classroom assessment is moving towards distilling key criteria categories from the curricular competencies. These developments may also have implications for future curriculum revisions.

Appendix 1: Relationship between Core and Curricular Competencies in Science

The Core Competencies — Thinking, Communication, and Personal and Social — are embedded in the Curricular Competencies. The Curricular Competencies introduced in Kindergarten are again expanded in a developmental continuum focused on the “doing” of science learning.

	K	3	6	10
Thinking	Demonstrate curiosity and a sense of wonder about the world	Demonstrate curiosity about the natural world	Demonstrate a sustained curiosity about a scientific topic or problem of personal interest	Demonstrate a sustained intellectual curiosity about a scientific topic or problem of personal interest
Communication	Share observations and ideas orally	Represent and communicate ideas and findings in a variety of ways, such as diagrams and simple reports, using digital technologies as appropriate	Communicate ideas, explanations, and processes in a variety of ways	Communicate scientific ideas, information, and perhaps a suggested course of action, for a specific purpose and audience, constructing evidence-based arguments and using appropriate scientific language, conventions, and representations
Personal and Social	Contribute to care for self, family, classroom, and school through individual approaches	Contribute to care for self, others, school, and neighbourhood through individual or collaborative approaches	Contribute to care for self, others, and community through individual or collaborative approaches	Contribute to care for self, others, community, and world through individual or collaborative approaches

Appendix 2: Exploring Concepts in BC's Redesigned Curriculum

13.1. Definitions Relevant to Concepts in BC Curricula

Concepts: In their most basic sense, concepts are simply ideas or thoughts; to think is to use concepts, concepts are the abstract, mental representations of the concrete world. Those concepts essential for understanding a particular discipline are generally identified in provincial curricula – sometimes categorized as essential vocabulary and sometimes identified as concepts.

13.2. Concept Development

How students' ideas (concepts) develop over time is central to instructional and assessment designing. It is through frequent experiences in a variety of contexts that students develop concepts. As such, concepts are woven into the whole fabric of the curriculum. Concept development is seldom linear and may be represented best by concept maps as in the Science Literacy Maps developed by AAAS Project 2061: <http://strandmaps.dls.ucar.edu/> In this site, the tutorial videos provide ideas about how student understanding typically progresses. In BC, some curriculum coordinators have investigated how particular concepts develop in their area of learning, see table below: Development of the Concept of Identity in Arts Education and ELA curricula and Big Ideas Continuum in Science

13.3. Crosscutting Concepts

To date, most of the work on crosscutting concepts has been in the area of science education. However, work in BC suggests that the concept of crosscutting can be applied more generally to all areas of learning. We can look at crosscutting concepts in two ways.

- *Crosscutting concepts have application across the disciplines that compose a single area of learning.* For example in BC, science curriculum is composed of the disciplines of biology, chemistry, physics and earth/space sciences. The table titled, Interdisciplinary Science Concepts, illustrates that there are two levels of concepts to consider – those that are discipline-specific (e.g., physics or chemistry) and those that cut across the set of disciplines (e.g., physics, chemistry, biology and earth/space science).
- *Crosscutting concepts can provide links across several areas of learning.* As shown in the table, Concepts Within Curriculum, some concepts cut across some or all of areas of learning.

Key Concepts: Key concepts are those discipline-specific concepts identified by curriculum developers (Curriculum Teams) to be the essential concepts required for the development of understanding within each area of learning.

The following are examples of concept work done by various groups who were exploring concepts while working on the redesign of BC curriculum.

Development of the Concept of Identity in Arts Education and English Language Arts

Ministry staff investigated the how certain concepts developed in early drafts of Arts Education and English Language Arts. The following is their work investigating the concept “identity,” which appeared in most curricula (either explicitly or implied).

Figure

Identity	ARTS EDUCATION	ENGLISH LANGUAGE ARTS
Definition of IDENTITY:	unique personal, behavioural or cultural characteristics by which a person, group or thing is recognized; or being close in similarity or identical to an individual or group; or the imaginative role taken on by an artist in an artistic work.	the set of characteristics that somebody recognizes as belonging uniquely to themselves and constituting their individual personality sense of self and belonging unique personal, behavioural, or cultural characteristics by which a person is recognized
Describe how the concept develops in the area:	<p>The concept of “identity” is woven throughout the Arts Education curriculum and can be found in at least one Big Idea in each grade (K-8).</p> <p>Students are introduced to the concept of “identity” in Kindergarten. Through the creative process, they explore artistic expressions of self, community and culture. Students are immersed in a variety of artistic works to express who they are and explore their sense of belonging through dance, drama, music and visual art.</p> <p>By the middle years, students use creative expression to convey their personal and cultural identity. Creativity enables students to connect their unique perspectives and experiences to those of others through works of art. Each subsequent grade offers opportunities for students to expand and deepen their awareness of self. They explore relationships between identity, place, culture, society and belonging through the arts.</p> <p>By Grade 8, the four disciplines in arts education offer unique yet interrelated opportunities for creative expression. For example, as students’ knowledge and experiences increase over time, so does their capacity to take on an imaginative identity through drama performance. Students’ creative growth requires a readiness to take risks and try new</p>	<p>The concept of “identity” is a constant in the Big Ideas and Learning Standards of the English Language Arts for each Grade K-9.</p> <p>Grade K-2: Big Ideas Engaging with story and text shapes and reflects our understanding of self and others. In K-2, students explore the concept of “identity”, as they engage with a variety of people and texts to: Develop an understanding of self, others, and the world through exploration and play Explore stories from a variety of cultures, including Aboriginal cultures, to gain an appreciation of identity, family, and community Create a variety of texts to deepen understanding of self, family, and community</p> <p>Grade 3-5: Big Ideas Making meaning and connecting with story and text through curiosity and inquiry deepens our understanding of self, identity and others. In 3-5, students investigate and expand their understanding of “identity”, as they: Explore a rich variety of texts, including story, to deepen learning and develop a broader understanding of self, family, community and the world Consider different perspectives, beliefs, and points of view in Aboriginal, Canadian and other cultural texts Create a variety of texts to explore self, family, and community</p>

approaches in the arts. High-level thinking takes place as students challenge the status quo and find new ways to express their identity by combining elements, processes, materials and techniques in their artistic works. Thinking critically about identity can lead students to a deeper level of understanding and self-discovery.

Grade 6-7: Big Ideas

Engaging in inquiry, making meaning, and connecting with our own and others' experiences through stories and texts deepens our understanding of self, identity, and others.

In 6-7, students expand and deepen their understanding of the concept of "identity", as they:

Make meaningful personal connections with a variety of texts to increase understanding of self and others

Consider multiple perspectives, voices, values, beliefs, and bias in texts from a variety of cultures, including Aboriginal ones

Compare ideas encountered in a variety of texts and genres

Grade 8-9: Big Ideas

Inquiry, curiosity, and thoughtful reflection in story and text deepen our understanding of self, identity, and humanity.

In 8-9, students develop a thoughtful, informed, and increasingly sophisticated understanding of the concept of "identity", as they:

Make meaningful personal connections with a variety of texts to increase understanding of self and others

Examine text in relation to social, historical, and cultural contexts

Demonstrate an understanding of how story supports the well-being of the self, the family, and the community in Aboriginal and other cultures

Big Ideas Continuum in Science

The science coordinator and curriculum team displayed all the big ideas in a chart to investigate how ideas (concepts) developed from K-9 in each of the disciplines of science.

Figure

Grade	Biology	Chemistry	Physics	Earth/Space
K	The basic needs of plants and animals are observable through their features.	Humans interact with matter every day through familiar materials.	The motion of objects depends on their size, shape, and material, and the amount of push/pull.	Daily and seasonal changes affect daily life.
1	Living things have features and behaviours that help them survive.	Matter is useful because of its properties.	Light and sound can be produced and their properties can be changed.	Observable patterns and cycles occur in the sky and landscape.
2	All living things have a life cycle that includes birth, growth, reproduction, and death.	Materials can be changed through physical and chemical processes.	Forces influence the motion of an object.	Wind and water change the shape of the land.
3	Classification organizes diverse organisms into groups based on their characteristics. Living things and their environment are interdependent.	Matter and energy flow through ecosystems. Matter has mass, takes up space, and can change phase.	Heat can be produced and transferred.	Water is a vital resource that cycles through the environment.
4	Living things sense and respond to stimuli in their environment.	All matter is made of particles. Different kinds of matter have different particles and therefore different properties.	Energy comes in a variety of forms that can be transferred from one object to another. Energy cannot be created or destroyed, only transformed.	Rocks, minerals, and soils are formed by processes that occur over a variety of time scales
5	Living things are comprised of cells, tissues, organs, and organ systems. Multi-cellular	Solutions are homogeneous mixtures.	Machines are devices that transfer force and energy.	Earth's rotation and orbit and the Moon's orbit cause observable patterns.

	organisms have organ systems that enable them to survive and reproduce.			
6	Multicellular organisms rely on internal systems to survive and interact with their environment.	Everyday materials are often homogeneous (solutions) and heterogeneous mixtures.	Newton's three laws of motion describe the relationship between force and motion. The fundamental force of gravity affects all objects with mass.	The solar system is part of the Milky Way, which is one of billions of galaxies.
7	The theory of evolution by natural selection provides an explanation for the diversity of living things.	Matter can be classified as pure substances and mixtures. Elements consist of one type of atom, and compounds consist of atoms of different elements chemically combined.	The fundamental force of electromagnetism produces both electricity and magnetism. Electricity is a key energy source for people because it is readily transformed into other forms of energy.	Fossil records provide evidence of geologic and environmental change.
8	Cell theory explains the fundamental nature of life.	The kinetic molecular theory and the theory of the atom explain the behaviour of matter.	The wave model can be used to account for the behaviour of light.	The theory of plate tectonics is the unifying theory that explains Earth's geologic processes.
9	Humans live in constant interaction with micro-organisms.	An element's properties are related to the arrangement and energy of its electrons and to its atomic size. The interaction of electrons allows atoms of different elements to form compounds.	The four fundamental forces govern the interactions of matter. Quantum theory is based on electromagnetic radiation behaving like both a particle and a wave.	Earth is composed of four interacting spheres through which matter cycles.

Concepts within BC Curriculum

The following chart is based on a quick review of all draft curricula available last year and a discussion with Coordinators. The highlighted concepts are those that cut across more than three areas of learning in the draft curricula. These can be considered crosscutting concepts across curriculum areas. It was noted that there is a need to define each concept to compare how they are used within each discipline. As well, it was apparent that some concepts are stated while some are implied.

Figure

	ELA	Arts Education	Social Studies	Science	HE/PE	Mathematics	FRALP
Adapt/Adaptation			X	X			
Authority			X				
Balance		X					
Cause and Effect/ Consequence			X	X	X		
Change		X	X	X	X	X	
Choice			X		X		
Classify/ Classification				X	X	X	
Cooperation			X		X		
Community		X	X	X			X
Conflict/Crisis		X	X		X		
Contact			X				
Culture	X	X	X	X			X
Cycles			X	X			
Ecosystems				X			
Energy		X	X	X	X		
Environment			X	X			X
Ethics		X	X	X			
Evolution			X	X			
Forces				X	X		
Form	X	X	X	X	X		X
Form and Function				X			
Genre	X						X
Harmony		X					
Identity	X	X	X		X		X
Innovation			X	X			
Interactions		X	X	X	X		
Interdependence			X				
Matter and Energy				X			
Meaning	X	X					
Motion		X		X	X		
Needs			X	X			
Order			X	X			
Organize			X				
Pattern		X	X	X	X	X	
Place	X	X	X	X			
Point of View/ Perspective	X	X	X				
Power			X				
Processes		X	X	X			
Probability						X	
Properties				X			

	ELA	Arts Education	Social Studies	Science	HE/PE	Mathematics	FRALP
Relationship		X	X		X	X	
Resiliency			X				
Resources			X				
Responsibility		X	X		X		
Role	X	X	X		X		X
Society		X	X				
Space		X		X		X	
Stories	X	X	X				
Systems and Structures	X	X	X	X			X
Sustainability			X	X			
Time	X	X	X			X	
Traditions		X	X	X			
Transform		X		X		X	
Unity		X					
Voice	X	X					
Worldviews		X	X				

Interdisciplinary Science Concepts

The first team of teachers working on science curriculum developed this chart as they investigated how ideas (concepts) developed in science. They noted that there are two levels of concepts – some crosscutting all disciplines of science and some specific to each discipline that compose the science curriculum.

Figure

Crosscutting (Interdisciplinary) science concepts			
Change Patterns Cycles Order Systems Form and function Matter and energy Interactions Evolution			
Biology concepts	Chemistry concepts	Physics concepts	Earth/space concepts
Basic needs of living things	Matter	Motion of objects	Daily and seasonal changes
Features of living things	Properties of matter	Light and sound properties	Observable patterns and cycles in the sky and landscape
Life cycles	Physical and chemical change processes	Forces influence on motion	Wind and water change the shape of land
Classification	Matter and energy in ecosystems	Heat transfer	Water cycle
Interdependence of living things and their environment	Properties and phases of matter	Energy transfer	Rock cycle
Living things response to stimuli	Particles of matter	Transforming energy	Earth and moon movement patterns
Composition of living things	Homogeneous mixtures	Machines	Solar system
Multi-cellular organisms	Heterogeneous mixtures	Laws of motion	Galaxies
Theory of evolution	Pure substances	Gravity	Fossil records
Cell theory	Elements and compounds	Electromagnetism	Theory of plate tectonics
Humans interaction with micro-organisms	Kinetic molecular theory	Electricity	Interacting spheres of Earth
		The wave model	
		Fundamental forces	
		Quantum theory	

Cross-cutting Concepts in Science

The following is from:

<http://www.nextgenscience.org/sites/ngss/files/Appendix%20G%20-%20Crosscutting%20Concepts%20FINAL%20edited%204.10.13.pdf>

“Crosscutting concepts have application across all domains of science. As such, they are a way of linking the different domains of science. They include: Patterns, similarity, and diversity; Cause and effect; Scale, proportion and quantity; Systems and system models; Energy and matter; Structure and function; Stability and change. The Framework emphasizes that these concepts need to be made explicit for students because they provide an organizational schema for interrelating knowledge from various science fields into a coherent and scientifically-based view of the world.”

Crosscutting concepts have value because they provide students with connections and intellectual tools that are related across the differing areas of disciplinary content and can enrich their application of practices and their understanding of core ideas. — Framework p. 233

1. Patterns. Observed patterns of forms and events guide organization and classification, and they prompt questions about relationships and the factors that influence them.
2. Cause and effect: Mechanism and explanation. Events have causes, sometimes simple, sometimes multifaceted. A major activity of science is investigating and explaining causal relationships and the mechanisms by which they are mediated. Such mechanisms can then be tested across given contexts and used to predict and explain events in new contexts.
3. Scale, proportion, and quantity. In considering phenomena, it is critical to recognize what is relevant at different measures of size, time, and energy and to recognize how changes in scale, proportion, or quantity affect a system’s structure or performance.
4. Systems and system models. Defining the system under study—specifying its boundaries and making explicit a model of that system—provides tools for understanding and testing ideas that are applicable throughout science and engineering.
5. Energy and matter: Flows, cycles, and conservation. Tracking fluxes of energy and matter into, out of, and within systems helps one understand the systems’ possibilities and limitations.
6. Structure and function. The way in which an object or living thing is shaped and its substructure determine many of its properties and functions.
7. Stability and change. For natural and built systems alike, conditions of stability and determinants of rates of change or evolution of a system are critical elements of study.

Significant Themes (Concepts) Identified by Curriculum Groups

- Sustainability
- Nature
- Freedom
- Citizenship
- Globalization
- Order and chaos
- Change
- Responsibility
- Balance
- Perspective
- Identity
- Equality

- Energy
- Justice
- Heritage
- Turning points
- Place
- Culture
- Well-being
- Interactions
- Power and Authority
- Systems

Defining Values and Attitudes in the Context of Learning and Well-Being

Helen Haste (Harvard Graduate School of Education/University of Bath)

1. Introduction

Values, attitudes and the beliefs that frame our preferences permeate our lives. It is appropriate to regard them as essential components of well-being and human flourishing. They derive from our cultural contexts and reflect both direct learning and the process of ‘catching’ learning. Learning in general requires more than the acquisition of knowledge and skills. Furthermore, even objectively-assessable knowledge is not purely fact-based nor value-free; what we choose to include in learning agendas depends on what we see as desirable for individual and societal flourishing and these priorities vary across geography and time. All effective learning also depends on individual motivation and how people and cultures define and value achievement goals.

There is considerable diversity and variation between (and within) societies about what values, and attitudes should be prioritized. Furthermore, there is considerable variation in how these values and attitudes are interpreted in different contexts and understood to be developed; even where there appears to be commonality in terminology, what is meant by the concept names by the associated terms, and so what is emphasised in fostering learning, may be very different. What will teacher Ms. Wong in Shanghai think to be important to prioritize in education? What will Mr Ngoro in Nairobi? Will Ms Baskins in the US Bible Belt be able to – or want to - promote the same learning agenda as Mr Robbins in liberal North London? Also, we need to determine what a particular value means in different contexts. ‘Respecting one’s elders’ will mean different things to the students in Ms. Wong’s class from Mr. Robbins’ and these different interpretations will also have different implications for what kind of actions and relationships are required of students and teachers.

These variations are likely to have considerable implications for discussion and dialogue. A further sensitive issue arises from the connotations that exist in many cultures regarding certain concepts. ‘Civic’ for example is not an acceptable term in China; instead, education for values may be described as ‘moral’ (“deyu”, which covers a number of areas that in other countries would come under ‘civic’). ‘Political’ education is an explicit curriculum, however, in which the ideological foundations of ‘Communism with Chinese characteristics’ are conveyed both as a form of analysis and as a

prescription for values.¹ ‘Socialism’ is a mainstream concept (and system) in most democracies but it is a term highly problematic to many people the United States.

A further example of the same terms connoting different meanings in different contexts occurs in how lay people and scholars use terms associated with values and attitudes. ‘Morality,’ for example, is a term which for some people covers all matters of right or wrong; for others, morality only refers to the private domain of individual processes and not, for example, to ‘civic’ matters. ‘Ethics’ in some cultural contexts covers moral processes especially involving reasoning but may also extend to motivation and action. ‘Character’ is a lay term used to cover moral and ethical actions, motives, and qualities, which is also being explored in scholarship as an eclectic concept in which there are debates as to what counts as ‘morality’ and what counts as ‘facilitating moral agency.’²

The antecedents of values; different theoretical models

The foregoing lays out an argument for making transparent the explicit and implicit connotations of terms used in the discussion of values and attitudes, in order to facilitate dialogue and the perspective-taking that enables effective deliberation of complex issues.

Two further dimensions of potential conflict and misunderstanding are a) the underlying models of what comprises well-being in the context of values and attitudes and b) the underlying models of how development of values and attitudes takes place. These models are informed by social science and philosophy and they have different implications for both informal and formal education. Three broad perspectives offer rather different explanations of development, forefront different aspects of values and attitudes and have different implications for social order.

1. Value development, identity, and well-being rest on *emergent habits, skills and predispositions*, which are seen as enduring and predictable attributes of the person. They are established through practice and role modelling and are strongly linked to a sense of oneself as being or becoming a certain type of person. The effective wide fostering of such habits in the population is an integral part of maintaining good interpersonal and community relations and social responsibility towards the polity.
2. Values, beliefs and attitudes, especially those relating to ethical or moral judgment, depend on *reasoning and justifications based on principles and intention-based evaluation*. Maturity and skill, whether in the ethical domain or in other areas of life choices and decision-making, rest on the cultivation of good reasoning abilities including critical deliberation. Both individual wellbeing and social order, including the capacity to challenge social institutions based on principles, rest on effective education for these cognitive skills.

¹ Kennedy, K. J., Fairbrother, G., & Zhao, Z. (2013). *Citizenship education in China: Preparing citizens for the "Chinese century"*. Routledge.,

Jacka, T., Kipnis, A. B., & Sargeson, S. (2013). *Contemporary China: Society and social change*. Cambridge University Press.

Xiang, B., & Yan, Y. (2011). The individualization of Chinese society. *Journal of Biosocial Science*, 43(1), 126.

Lee, W. O., & Ho, C. H. (2005). Ideopolitical shifts and changes in moral education policy in China. *Journal of Moral Education*, 34(4), 413–431. <https://doi.org/10.1080/03057240500410160>

² Althof, W & Berkowitz, M.W (2006) Moral education and character education; their relationship and roles in citizenship education. *J. Moral Education* 35(4), 495-518

3. Values and attitudes, and the motivations to act in accordance with them, depend also on *emotional factors*. These include both the emotions associated with the values and the emotions aroused in specific situations which prompt action; for example, disgust is associated with *beliefs about* negatively-balanced situations or phenomena but is also aroused when *encountering* that phenomenon. Emotional empathy is valued positively as a response and empathic skills are also to be cultivated. Promoting well-being and an identity that is motivated towards the acquisition of, support for and action within a value system rests on emotional moderators such as guilt or shame, or the education of emotions such as compassion (or indeed, culturally-relevant disgust).

It is important to recognize the ways in which these models of development may have very different implications for defining ‘well-being’ and especially, how socialization requires rather different strategies. There are different emphases on how values and attitudes develop, and therefore on what psychological and social processes should be prioritized for maximising individual and social capital.

Thus, discussions about the role of values, beliefs and attitudes in learning that contributes to well-being need to attend to, first, a discussion about the terminology used in both scholarly and lay language in order to be clear about what meaning is intended, and what assumptions about the psychological and social processes involved in learning (or ‘catching’) underlie the terms’ usage. Second, it is necessary to attend to cultural variation – which may be considerable - in how these terms are utilised, and how and which values and attitudes are seen as enabling individual and social flourishing and well-being. The paper addresses such definitions, assumptions and implications in current theoretical and empirical research.

2. Terms and Definitions

2.1. Attitudes

“An “attitude” may be defined as the overall mind-set which an individual adopts towards an object (e.g. a person, a group, an institution, an issue, a behaviour, a symbol, etc.) and typically consists of four components:

1. a belief or opinion about the object,
2. an emotion or feeling towards the object,
3. an evaluation (either positive or negative) of the object, and
4. a tendency to behave in a particular way towards that object.” Council of Europe (2016)³

Attitudes are extensively studied in social psychology, usually by the use of scales rating agree-disagree⁴. Typically, several attitude items are collated to create a picture that

³ Council of Europe (2016), *Competences for Democratic Culture: Living Together as Equals in Culturally Diverse Democratic Societies*, Strasbourg: Council of Europe.

enriches the scope; for example, ‘rightwing political attitudes’ might include items relating to several aspects of or targets of opinion, on race, social control, religion, economic policy. An attitude measure therefore assumes that it is not capturing a single opinion but a spectrum of beliefs that have subjective internal consistency within the culture studied, and that underlying this spectrum is a common psychological theme; for example, ‘conservative’ political attitudes may be associated with a general anxiety about change, ‘liberal’ attitudes with an openness to new ideas⁵.

In some theoretical frameworks, attitudes are seen as enduring and predict both other attitudes and also behavior. Therefore, fostering the development or learning of particular attitudes may be seen as a foundation for both individual well-being (certain attitudes enhance self-confidence, efficacy or sense of purpose) and social well-being (the widespread and normative presence of particular attitudes promoting the pursuit of justice, responsibility to the community, diversity, trust in institutions, etc.). Similarly, in times of social crisis or disruption we see the promotion of alternative attitudes to act as counter perspectives to those regarded as unhelpful to the current cultural agenda. We currently for example see the deliberate promotion of entrepreneurial attitudes and competition by the Chinese government in the transition from a community and collective oriented society⁶. We also see a widespread reaction to examples of emergent populism and nationalism, in which it seems apparent that the dominant ‘liberal’ ethos of many countries, normative codes of diversity, anti-discrimination and globalization, is being contested.

Other theoretical perspectives see attitudes as less enduring, more subject to a variety of pressures to change, and often contingent on situational factors. There is a huge body of research, over nearly a hundred years, that demonstrates the conditions under which attitudes are malleable. Needless to say, in a democracy, the power of public opinion to influence change, and elections themselves depend on persuading significant numbers of people to change their attitudes. Commerce and the market depend on successful attitude (and behavioural) change. Factors which affect change include the persuasive power and credibility of communicators, the extent to which the beliefs that underpin attitudes can either be undermined, or attached to a different target (for example that Party X seems now more consistent with my personal beliefs than Party Y), or that new elements in the individual’s personal experience or perception of social issues emerge.

2.2. Values

A “value” may be defined as “one’s judgement of what is important in life” (Oxford English Dictionary) or it “may be defined as a general belief that an individual hold about the desirable goals that should be striven for in life; values transcend specific actions and contexts, have a normative prescriptive quality about what ought to be done or thought in

⁴ Jost, J.T., & Hardin, C.D. (2011). On the structure and dynamics of human thought: The legacy of William J. McGuire for social and political psychology. *Political Psychology*, 32, 21-57.

⁵ Carney, D.R., Jost, J.T., & Gosling, S.D. & Potter, J. (2008). The secret lives of liberals and conservatives: Personality profiles, interaction styles, and the things they leave behind. *Political Psychology*, 29, 807-840.

⁶ Kipnis, A. (2011). *Governing educational desire: Culture, politics, and schooling in China*. University of Chicago Press. Keane, M. (2001). Redefining Chinese citizenship. *Economy and Society*, 30(1), 1–17.

different situations, and may be used to guide individuals' attitudes, judgments and actions." (Council of Europe 2016).

These definitions encompass a range of elements. For example, while some values have ethical or moral connotations and are supported by principles that justify them, or impose obligations, other values are to do with aesthetic qualities or ideas of civilized behavior and personhood such as good manners. They may, however, exert an equally strong pressure on one's identity and obligation to conform. Values fuel our goals and motives, and are associated with identity, the kind of person one aspires to become, and the qualities and behaviour in others that one admires or repudiates. Values are underpinned by implicit theories of well-being and social capital; why a particular preference will serve one's best interests and happiness, or why certain values are desirable for general social capital or human flourishing.

We can distinguish domains of values: *Personal values*, *Social values* and *Societal Values*:

1. Personal values relate to goals for the self – what kind of person does one wish to be, what does one wish to strive for.
2. Social values relate to social interactions and one's community; what qualities of human interaction are desirable, and why, what kind of relationships does one see as beneficial and in what depth, what codes of trust, mutual responsibility need to be fostered (and how and on what criteria inclusion and exclusion should be managed)? Into what social skills should children be reared? Community-oriented or collectivist societies, for example, have different expectations, goals and skills than individualistic societies.
3. Societal values relate to maintaining (or critiquing) social institutions, codes and practices, which may also include causes or organizations that I may actively support. Societal values often have strong ethical connotations, for example relating to principles like justice, equity, compassion, sustainability, the rule of law. However, they may also be aesthetic values, such as protecting heritage, or the quality of a particular environmental space, or economic values around the allocation of resources.

Values are heavily embedded within cultural contexts, including whether a particular value is seen as ethical or not. For the purpose of productive discussion, it is particularly important to unpack the assumptions, principles and implicit theories behind a value; am I a vegetarian because I regard meat as unhealthy or because I morally object to how animals are reared for food? Do I not eat dogs because they are beloved pets or because they are unclean, taboo creatures? Or do I eat dogs? Is competition among children in school to be encouraged because it leads to healthy achievement motivation that benefits both the individual and society, or discouraged because it interferes with the important development of collaborative skills? Or because it institutionalizes hierarchy and difference?

Values underpin attitudes, as noted above. They are also inevitably a mixture of emotional responses, beliefs, and are, or can be, supported by reasoned justifications. They can be interpreted as enduring attributes of the person, with habit-like qualities, laid down early and maintained, or they can be seen as relatively transient; most writing assumes the former. Perhaps because of the rather vague and broad nature of the concept, there has been much less work done on values within psychology than there has been on attitudes. There are methodological issues; while attitudes can be encapsulated by short items and quantifiable scales, values are more difficult to capture. The main work on

values has been on how they form patterns, and what can be deduced from these. Rokeach's classic study, for example, grouped values according to whether they reflected an open-minded or closed-minded worldview, and he applied this to political beliefs in the United States; conservatives tend to be more closed-minded and less tolerant of change, liberals more open-minded and open to change⁷. Other studies suggest however that extreme ideologies on both Left and Right reflect closed minded cognitive styles; however, this work is largely done within the United States context.

Culture and values

Other work on value clustering focuses more on cultural factors. The World Values Survey (WVS) attempts to classify moral, social, economic and political values; their underlying agenda is to explore a 'developmental' trajectory towards more democratic systems; how do nations' dominant values change as they approximate more closely to Western-style democratic structures? The authors⁸, Inglehart and Welzel, explicitly claim that 'people's beliefs play a key role in economic development, the emergence and flourishing of democratic institutions, the rise of gender equality and the extent to which societies have effective government.'⁹ . ().

The WVS identifies two dimensions along which nations can be classified: *traditional versus secular-rational values*, and *survival versus self-expression values*. Sweden and Japan score highest on Secular-rational values; Ghana, El Salvador and Puerto Rico highest on Traditional values. Scandinavian countries and Canada score highest on Self-Expression values, and some former Soviet bloc countries and some African countries score highest on Survival values; but these ratings have varied over several waves of the WVS.

The WVS makes a strong claim also that emancipative values, which combine 'an emphasis on freedom of choice and equality of opportunities...priorities for lifestyle liberty, gender equality, personal autonomy and the voice of the people', act towards 'human empowerment. Once set in motion, this process empowers people to exercise freedoms in their course of action.' The WVS therefore appears to claim that individual values precede, and implicitly cause, social and cultural change.

More qualitative and ethnographic studies of social values describe patterns existing within cultures which may account for ways of describing, prescribing, and proscribing behaviours and highlight their dominant themes and explanatory justifications. One consequence of such studies has been to emphasise the importance of cultural processes in normalizing particular values, and challenging the assumptions of 'universal' human values. Anthropological and historical work in the 19th and early 20th centuries elaborated the very diverse ways in which people in different cultures, and different times, made sense of experience and social order. Some recent examples include Shweder's work, initially in India, which identified three different 'ethics' or value patterns; autonomy, community and divinity (sanctity)¹⁰. The ethic of autonomy prioritizes individual choice and self-determination, the ethic of community emphasises one's relationship with the community and the need to place community needs above one's individual needs. The

⁷ Rokeach, M. (1973) *The nature of human values*. New York: Free Press.

⁸ Inglehart, R. & Welzel, C. (2005). *Modernization, Cultural Change, and Democracy: The Human Development Sequence*. Cambridge University Press

⁹ <http://www.worldvaluessurvey.org/WVSContents.jsp?CMSID=findings>

¹⁰ Shweder, R. Mahapatra, M. & Miller J.G. (1987) Culture and moral development. In Kagan, J. & Lamb, S. *The emergence of morality in young children*, Chicago; University of Chicago Press. 1-82.

ethic of divinity or sanctity defines actions and objects in terms of pollution, taboo or observance of religious codes. The importance of Shweder's work lies especially in the fact that these ethics *coexist* in the Indian society in which he worked, thus obviating the need to classify a culture in terms of one versus another ethic. Individuals were entirely skilled in knowing in what terrains of life each ethic was applicable.

This pluralist model is important because it enables us to recognise the coexistence of multiple value patterns, and that cultures may both privilege some patterns in certain contexts, and also ensure that members of the culture are fully socialized into the depth and diversity of these patterns and the behaviours and responses required within them. In the context of moral development with a model of reasoning, Kohlberg developed a theory of morality that rested, in the Kantian tradition, very much on both the universalizability of principles and a core ethic of justice¹¹. His coding was based on data from boys in Chicago, whom he followed up over 20 years from 1956. It emerged from international studies that in other, non-Western, countries justice was not the dominant ethic, but filial piety or honour were. Coding these data created problems; specifically, when Kohlberg's team were asked to code the obviously complex reasoning of Shweder's senior participants, they could not adequately capture this complexity. Further, Gilligan, working with US women and girls, found that an ethic of care and responsibility was often preferred to justice¹². After further research, it appears that an ethic of care and responsibility coexists in American culture with an ethic of justice, and that in addition to possible gender effects, the moral dilemma itself prompted different ethics; personal dilemmas for both sexes tended to invoke a care ethic, whereas more abstract dilemmas evoked justice reasoning¹³.

Haidt's work on 'moral foundations' elaborates these pluralist arguments¹⁴. Haidt, building on Shweder, identified at first five, then six, 'foundational' value patterns among American respondents. Each emphasises a different value as a basis for prioritizing aspects of a moral decision. The conclusion drawn is that these 'moral foundations' coexist within American culture but that other value factors influence which one(s) are preferred. Haidt and colleagues have explored the relationship between political orientation and moral foundations; they found initially that people self-defining as 'liberal' gave greater weight to the foundations, or ethics, of *justice* and *care*, downplaying *authority*, *sanctity/purity*, and *loyalty*. In contrast, 'conservatives' give more equal weight to all five. When Haidt and colleagues introduced a sixth foundation, liberty, they found that libertarian conservatives prioritized this over all. The extent to which moral foundations accurately maps value patterns in non-US cultures is still uncertain; however, the message that cultures contain parallel and coexistent values is clear, and the need for unpacking the underlying assumptions in any discussion of values is evident.

2.3. Beliefs

'Beliefs' underpin attitudes and are intertwined with values, which is where they have been mainly researched. A belief may be factual or may be a conviction. The point about

¹¹ Colby, A. & Kohlberg, L. (1987) *The measurement of moral judgment*, New York: Cambridge University Press

¹² Gilligan, C. (1982) *In a different voice*, Cambridge, MA: Harvard University Press

¹³ Walker, L.J. (1984) Sex differences in the development of moral reasoning; a critical review. *Child Development* 35, 677-691

¹⁴ Haidt, J.(2014) *The righteous mind*, New York: Pantheon Books

beliefs for our purposes is that they justify value positions because they are part of narratives of cause and effect. If I believe that, *factually*, capital punishment reduces crime, this knowledge is likely to affect my values regarding its use. If I believe in the existence of a divinity and an afterlife that depends on my lifetime actions, this belief is likely to influence my values regarding many areas of morality, and also how I evaluate my actions. If I believe in the importance of promoting a particular value, or value-related practice, for the well-being of society, even without drawing on facts in justification, I am expressing a conviction based on an underlying theory of what makes for well-being – as for example is implied in moral foundations.

For the above reasons, ‘beliefs’ are largely subsumed by the arguments and research presented under the heading of ‘values.’ For the purposes of effective discussion, it is useful to unpack and make explicit not only whether a belief is fact-based but how that fact is seen as validating particular value conclusions. If a belief is a conviction, rather than fact-based, its justification is likely to rest upon an implicit theory about why and how what is believed contributes to well-being. Ultimately this must be a matter of respect for different points of view, worldviews, or foundational values.

2.4. Principles

These are the core beliefs that underlie values, the fundamental concepts behind what it is important to forefront or cultivate for well-being overall: examples would be justice, equality, freedom, dignity, discipline, compassion. Principles are a foundational element of reason-based moral theory. It is a criterion of some moral theories that principles, to count as such, should be universalisable¹⁵. However, as we have seen, social science research around how humans actually behave, in a cultural and time-bound context, indicates that we treat as a ‘principle’ any value that we perceive to be in effect a core belief – that all life is sacred, that we should treat others equally, that promises should be kept. While Haidt’s moral foundations cover some core principles, they do not include all that currently apply across cultures.

In discussions about values, the use of principles needs to be considered in terms of how core beliefs are being used to justify or select value choices, and the extent to which they are generalizable (even if not universalisable). One of the characteristics of higher stage – more complex – reasoning within Kohlberg’s moral stage theory was that this involved appeals to basic principles not opinion or moral preference. However, relatively few people reach this moral stage – less than 10% of his longitudinal sample by their mid-thirties. On the other hand, studies of people showing extraordinary moral responsibility or courage do not necessarily score high on Kohlbergian moral stage measures, but speak of their motivation and moral commitment in terms of core principles by which they define their identity¹⁶.

2.5. Virtues and Character:

Virtue-based ethics and morality are conventionally associated in the West with Aristotle and in the East with Confucius. Virtues are personal qualities that are assumed to be enduring and consistent, disciplined habits of responses and behaviour that enable good

¹⁵ Hare, R.M. (1963) *Freedom and reason*. Oxford: Clarendon Press

¹⁶ Colby, A. & Damon, W, (1992) *Some do care*, New York: Free Press,
Walker, L.J. & Frimer, J.A. (2007) Moral personality of brave and caring exemplars, *J. Personality & Social Psychology*, 93 (5) 845-860.

relationships and social order. Their foundations are laid down early in life and are strengthened by habit. The theoretical traditions that forefront virtue consider virtues to be the basis of both individual and societal well-being. Living a good life means doing the right things in the right way at the right time. The good life benefits the community as well as the individual. A core concept is moderation; choosing the mean not extremes. Reason plays a crucial role in virtues but virtues are more than reasoning.

Aristotle identified four cardinal virtues; prudence or practical wisdom, temperance or self-regulation, courage, and justice or fair dealings with people. Over the centuries, numerous other virtues have been added to cultural definitions of good character. They vary in the extent to which they reflect moral obligation or principles or are qualities which contribute to ‘gentlemanly’ behaviour and polite social relations in a harmonious society¹⁷.

Aristotle shared with Confucius, who was roughly a contemporary, the concept of the ‘gentleman’ as the goal of self-development and personal morality¹⁸. His core concepts also were skilled judgment, knowledge and sincerity, and following moral exemplars. Li means following appropriate reverence of ancestors, social etiquette and actions contributing to building the ideal society. Yi means doing the right thing for the right reason, for the common good. Ren is about fulfilling one’s responsibilities to others; through benevolence, empathy and diligence. Confucian principles are being revived in contemporary Chinese thinking about character.

Character and virtues and the idea of a ‘good person’ have a strong appeal in lay thinking, to the extent that the idea of morality comprising reasoning from ethical principles is resisted as incomplete; one may after all be able to reason but if this does not translate into action or good habits it does not make one a good person. However early research on ‘character’ failed to find a consistent relationship between the various elements.

Recent work on character and virtues attempts to find integration. Berkowitz, Bier and McCauley (2017)¹⁹, for example, define character as ‘a set of psychological characteristics that motivate and enable one to function as a moral agent, to perform optimally, to effectively pursue knowledge and intellectual flourishing and to be an effective member of society’. These include moral reasoning as a ‘core’ moral process, but also the attributes of perseverance, loyalty and courage which support moral agency. Damon offers a generic concept to underpin character development; the cultivation of a sense of purpose²⁰. Most approaches to character education include critical thinking. Character Counts, a group dedicated to promoting core values, identifies six ‘pillars of character’: trustworthiness, respect, responsibility, fairness, caring and citizenship.²¹

The Jubilee Centre at the University of Birmingham focuses on virtues but with a meta-perspective of practical wisdom which entails ‘considered deliberation, well-founded judgment and the vigorous enactment of decisions... foresight... being clear sighted and far sighted about the ways in which actions will lead to desired goals’²². The proposed ‘moral’ virtues are compassion, courage, gratitude, honesty, humility. Integrity, justice

¹⁷ Aristotle (1955) *The ethics of Aristotle*, Harmondsworth: Penguin

¹⁸ Confucius (1979) *The analects*. Harmondsworth: Penguin

¹⁹ Berkowitz, M.W., Bier, M. & McCauley, B (2017) *Towards a science of character education; frameworks for identifying and implementing effective practices*

²⁰ Damon, W. (2008) *The path to purpose; how young people find their calling in life*. New York: Free Press

²¹ <http://charactercounts.org>

²² <http://jubileecentre.ac.uk>

and respect, but the model also included intellectual virtues ‘traits necessary for discernment, right action and the pursuit of knowledge, truth and understanding’; civic virtues: ‘citizenship, civility, community awareness, neighbourliness, service, volunteering’ and performance virtues: ‘confidence, determination, motivation, perseverance, resilience, teamwork’.

Accounts of character are therefore eclectic. In common they have lists of virtues which can be seen as morally obligating and serving moral purposes of interpersonal responsibility. They also include virtues which are more to do with sustaining action, motivation and self-regulation which may serve many purposes (including academic performance). There are variations in emphasis, in the extent to which virtue development is seen as contributing to the good life of the community and society in general, or to the capacity of the individual to develop autonomy and self-determination.

2.6. Moral reasoning

Fore-fronting reasoning as the basis for morality derives from the Kantian view that something can only be moral if it is based on reasoning from universalisable principles. Moral reasoning has also been seen as the basis for being able to reflect upon and critique moral situations with the purpose of moral improvement – whether of the self or the wider society. It has been linked to core principles of democracy.

The major body of research carried out on morality in the late 20th century was done on moral reasoning, especially arising from the work of Lawrence Kohlberg on moral stages²³. Based on his longitudinal study over 20 years, he identified six stages of increasing complexity in moral reasoning. The complexity depended upon perspective-taking, the number of actors or persons of interest incorporated into the reasoning (from one, through to a hypothetical social order), and upon the extent to which the reasoned could draw on principles in making a judgment. As noted earlier, the core system of principles that the theory drew upon was justice, which created problems with cultural variation. However, subsequent research did support the sequence of stage development, with the point noted earlier that very few adults in fact reach ‘post-conventional’ reasoning (Stage 5), and are able to reason from principles beyond exemplars found in current society; and that Stage 6 is largely a hypothetical construct based on very exceptional individuals.

Two important education applications from this theory were that moral reasoning is enhanced by extensive open-ended discussion in a democratic environment, and that a climate that not only encouraged democratic discussion but also explicitly enacted democratic practices (a ‘just community’) was particularly beneficial²⁴. These findings have parallels in work which show that a democratic school environment is conducive to the development of critical thinking more broadly.

2.7. Conscience

Conscience is a concept widely understood in many cultures as the criterion of moral competence and the primary regulator of moral performance; it is considered an emotionally powerful organ of self-criticism and regulation. It frequently has strong religious connotations. Arousing one’s conscience usually involves a disjunction

²³ Colby & Kohlberg (1987) *op.cit*

²⁴ Power, F.C. (1988) The Just Community approach to moral education. *J. Moral Education*, 88(3) 195-208

between what one believes (reasons) to be right, how one thinks of oneself as a moral person (identity) and performing a transgressive act. However, it is in the power of the painful emotion that the moral process resides. Both guilt and shame – though in somewhat different ways – rest on the operation of conscience.

In educational terms, and in many cultural contexts historically and currently, cultivating guilt and/or shame has been seen as the primary educational route to moral competence development. Manifestly, although guilt, shame and conscience are experienced in highly personal ways, the social and cultural norms with which they are associated have large implications for civic and societal norms, order and social control – including powerful affective reactions when social changes challenge widely-held values associated with conscience and lead to expressions of moral distress.

Despite the force of conscience in public and common sense moral perspectives, there has been relatively little research on this concept. Freud developed the theory of the Ego, Superego, Ego Ideal and Id which captured and promoted the culturally widely described subjective experience of the ‘inner voice’ which judges one when one departs from standards associated with one’s ego ideal, and the accompanying pain. Conscience is therefore a core element of self-regulation as well as the internalisation of cultural moral norms. More recent work has tended to focus on the conditions under which young children acquire self-regulatory guilt²⁵.

2.8. Civic Values

Traditionally ‘civic’ referred to obligations regarding governance in the public domain especially around voting or duty to the community. Increasingly it is recognised that individual civic participation, civic responsibility and goals for societal well-being, are driven by values, ethics, and related motives so the boundary between ‘civic’ and ‘moral’ has blurred²⁶. Civic education is a sensitive issue in many cultures, as noted earlier, and there is a tension, even within societies, between whether it should be serving to train more active participation in the existing social order, maintaining the system, or whether it should be fostering critical thinking and the skills to challenge the system. Many would argue that a healthy democracy needs both kinds of skills, but there is considerable controversy around these issues²⁷.

The emergent research and thinking suggest that the following strands of skills and competence contribute to the effective citizen: *civic knowledge and understanding*; *civic skills*; *civic values, motivation, and identity*; and *civic action*.

Civic Knowledge and Understanding: Citizens require knowledge about political structures but also about controversial issues, intergroup relations, local and community affairs. However civic knowledge alone is not enough; an active civil society requires also skills for reflective and responsible action, willingness to engage, and commitment to democratic values.

Civic Skills: These include intellectual, participatory, and socio-emotional skills; to make sound political choices, to take part in collective decision making, conflict resolution, and

²⁵ Kochanska, G., Gross, J.N., Lin, M-H & Nichols, K. (2002), Guilt in Young Children: Development, Determinants, and Relations with a Broader System of Standards *Child Development*, 73(2), 461–482

²⁶ Carretero, M., Haste, H. & Bermudez, A. 2016) Civic education. In L.Corno & E. M. Anderman (Eds) *Handbook of educational psychology*. 3rd edition, (pp. 295-308) New York: Routledge.

²⁷ Hess, D. & McAvoy P. (2015) *The political classroom*, New York: Routledge

negotiation, to discuss controversial social and political issues, or monitor government action on behalf of public interests. Civic skills are procedural – ‘knowing how’: to analyse, evaluate, reach conclusions, take and defend positions. Participatory skills include working with others, building coalitions, and managing conflict. Other skills include communication, organization and collective decision making. Socio-emotional and interpersonal skills include healthy relationships with family, peers, and community members.

Civic Values, Motivation, and Identity: These comprise values, motives, and identities that promote effective democratic practices, such as taking responsibility voting and helping others, upholding the law, monitoring current affairs in the media, tolerance and respect for diversity, and concern with rights, welfare, freedom, or justice. Moral values motivate civic action because they make issues personally relevant and contribute to a sense of personal responsibility. Civic identity includes feeling that one is responsible to one’s community, having confidence in one’s ability to take action and achieve results.

Civic Action: Research has found that real-life authentic civic action experience contributes to civic motivation, purpose, responsibility, and efficacy. Learning opportunities may include standing up against prejudice, discrimination, and harassment. Student government within schools, for example, affords opportunities for civic voice. Families, peer groups, and social media can be sites for discussing controversial issues. Youth organizing and community-based civic action are found to be particularly salient as site for civic education among members of marginalized communities.

3. Points to consider:

1. The foregoing is a basis for understanding what is behind different terminology and why it matters to make intended meaning and implicit assumptions transparent.
2. A great deal of research on values has been performed – and theorized – on US samples. Any conclusions that are drawn need to be carefully scrutinized before any generalization is made to other cultures, even within the West.
3. It is important to make explicit that some terms have loaded connotations in different cultural, political, or religious contexts and using the terms needs to be circumspect and transparent as to the concepts underlying them.
4. There some important differences in the theories and approaches about how, where, and with whom learning about values and attitudes should take place. These differences require careful scrutiny in interpreting arguments, explanations and models.

Anticipation and Agency

Peter Bishop (Teach the future Inc.)

1. Introduction

Student agency is becoming an increasingly important concept in education, both as a goal and as a process. The continuous cycle of “Anticipation-Action-Reflection” (“AAR”) is a learning spiral in which students can develop competencies through lifelong and life-wide learning. The intent of the paper is to review the current literature on “Foresight” and find out how it relates to the idea of Student Agency as set out in the OECD 2030 Learning Framework and supports “Anticipation” as a construct within “AAR” cycle.

2. Psychological Basis

Daniel Gilbert, a social psychologist, explored the neurophysiology of imagining (simulating) the future.

The brain combines incoming information with stored information to build “mental representations,” or internal models, of the external world. The mental representation of a past event is a memory, the mental representation of a present event is a perception, and the mental representation of a future event is a simulation. One way to predict the hedonic consequences of a future event is to simulate it, and the brain's frontal regions appear to play a critical role in that process...

People mentally simulate future events, but how do they use those simulations to predict the event's hedonic consequences? As the mere thought of eating a liver popsicle reveals, mental simulations of the future can elicit hedonic reactions in the present. People use their immediate hedonic reactions to simulations as predictors of the hedonic reactions they are likely to have when the events they are simulating actually come about. People do not imagine feeling anxious while having a colonoscopy so much as they imagine a colonoscopy, feel anxious, and then take this anxiety as an indicator of the feelings they can expect to experience during the procedure itself. Simulations allow people to “preview” events and to “prefeel” the pleasures and pains those events will produce. [1]

Albert Bandura, a noted social psychologist, wrote extensively about motivation and self-efficacy. While Bandura used different terms, he summarized the role that Anticipation plays in the motivation to Act.

The capability for intentional and purposive action is rooted in symbolic activity. Future events cannot be causes of current motivation and action because that would entail backward causation in which the effect precedes the cause. However, by being represented cognitively in the present, conceived future events are converted into current motivators and regulators of behaviour. Action is motivated and directed by cognized goals rather than drawn by remote aims. Forethought is translated into incentives and guides for action through the aid of self-regulatory mechanisms. [2]

3. Anticipation and Agency in Academic Institutions

3.1. Futures Studies at the University of Houston

Futures studies and foresight are about change. At the University of Houston, it begins with a discussion of change before the discussion of the future itself. The first distinction about change is where change and the future come from. Very simply, the future is a combination of what is changing in the world and it could turn out versus what the individual or enterprise is doing or will do in the future. This is known as the former Inbound change because it impacts us; the latter is called Outbound change because we are acting to influence the world. [3]

This distinction is the basis for the connection between Anticipation and Agency. We *anticipate* change from the world (Inbound) and act as active *agents* to influence change in the world (Outbound).

As a result, the field of futures studies or foresight¹ is divided into two divisions – Forecasting or Anticipation (what the world is doing now and might do in the future) and Planning or Action or Agency (what we are doing now or may do in the future to influence it).

A further elaboration is based on Hines and Bishop's *Thinking about the Future: Guidelines for Strategic Foresight* [4]. The book is a collection of more than 140 tips and techniques for practising foresight from three dozen foresight professionals. The materials received were further divided into six categories –

1. Framing – beginning a foresight project by establishing its objectives and parameters
2. Inbound – describing the expected and alternative futures at some time horizon in the future
 - a. Research – gathering information on which to base the forecasts
 - b. Forecasting – describing those futures and their implications for the enterprise
3. Outbound – influencing the future by intentional actions
 - a. Visioning – identifying the preferred future and goals that would head in that direction
 - b. Planning – organizing people and resources to achieve the goals

¹ The various names of this field will be covered in a subsequent section.

c. Action – implementing the plan in an iterative and reflective manner

Other Houston research used this same framework –

1. This process was written up in summary form by Hines and Bishop [5].
2. These categories were also the basis of an assessment of foresight practices called the Foresight Maturity Model. [6]
3. Finally, the process is the basis of two recent books for students: *What the Foresight: Your Personal Futures Explored. Defy the Expected and Define the Preferred*, by Alida Draudt and Julia Rose West [7] and *The Futures Thinking Playbook*, by Katie King and Julia Rose West (forthcoming) [8]

Of course, all of these sources are based on the Houston approach to foresight.

3.2. Futures Studies at other academic institutions

A comparison of the curricula from five academic foresight programs revealed roughly the same process. Dr. Peter Bishop published the results of a year-long series of teleconferences involving five academic programs in foresight in the *World Future Review* [9].

The academic programs involved were:

- Ontario College of Art and Design, Greg van Alstyne, Toronto ON
- Regent University, Jay Gary, Virginia Beach VA
- Swinburne University of Technology, Peter Hayward, Melbourne VC
- University of Hawaii at Manoa, Jim Dator, Honolulu HI
- University of Houston, Peter Bishop, Houston TX

Dator described the Manoa approach in 2009 [10]. Bishop and Hines described the Houston approach in *Teaching about the Future* [3] and then in article form [5]. Joseph Voros described the Swinburne approach [11].

The three approaches were remarkably similar as depicted in Table 3.1.

Table 3.1. Comparison of Hawaii-Manoa, Houston and Swinburne Foresight Processes

Framework Foresight (Houston)	A Futures Visioning Process (Manoa)	Foresight framework (Swinburne)
Framing Research, Scanning Forecasting (Expected future, Alternative futures)	Appreciating the past Understanding the present Forecasting aspects of the future	Inputs (see what's happening) Foresight Analysis (what seems to be happening?) Interpretation (what's really happening?) Prospection (what might happen?)
Visioning, Goal setting	Experiencing alternative futures	Outputs (what might we need to do?)
Planning Acting, Leadership	Envisioning the futures	Strategy (what will we do? how will we do it?)

They all begin with a consideration of how the world might appear in the future (Anticipation) and they end with what individuals, organizations or institutions can do about it (Agency).

4. Anticipation and Action in Futures Research

Jennifer Gidley is a well-known educational psychologist who has written extensively on the role that education can and should play in dealing with the future and particularly in creating the Agency that students need to be successful in the world.

She published one of the few empirical studies on images of the future, in this case, for students.

A pilot study with 14-15 year old high school students (N=51), investigated the effects of a cognitive intervention strategy of time projection, on hopelessness. Both control and experimental groups were pre-tested on hopelessness (BHS) and images of the future (Positive Future Scale). A four-session intervention program, called 'Creating Positive Futures', targeted the negative images of the future among the experimental group and attempted to promote more positive images of the future. The control group attended normal classes. After the intervention, both groups were post-tested on the same scales and a repeated measures analysis of variance was used to analyse the change and interrelationships. The intervention resulted in a statistically significant increase in positive future images ($p = 0.01$) of the experimental group compared with the control group relative to pre-test scores. Correlations between the BHS and the PFS were significant at both the pre-test ($p = 0.25$) and the post-test ($p = >0.001$) for the whole group. The Positive Future Scale (PFS) was also validated as part of the study. The study also indicated that the intervention had potential for reducing hopelessness, particularly in boys, though this did not reach statistical significance. [12]

Later she summarized her findings in a literature review on futures and education. Three key parts of her review are relevant for the connection between Anticipation and Agency.

1. Wilson's major study reflected other findings about the negativity, fear and feelings of powerlessness. However, he also stressed two other key issues, indicating that although this was a quantitative survey, his own underpinning paradigm was critical and empowerment oriented rather than positivist. His recommendations stressed:
 - the importance of giving students the opportunity to create alternative Scenarios
 - the necessity to work with empowerment of the youth to help them begin to feel that they can influence change in a positive way. (P 11)
2. Empowerment and futures education
Youth are part of the solution; they must have an education that empowers them to feel this. ... Many students in the study changed their attitudes to issues of ecology and the future as they began to see the connection between their attitudes and their actions. (p 21)
3. Futures Studies techniques can be extremely valuable in countering the fears that many young people have about the future. A number of Australian studies have engaged young people in working through their fears and beginning to activate their imaginations to envision their 'preferred futures'. The findings all indicate that this type of 'futures in education' can be very rewarding and even empowering for the participants. (p 21) [13]

David Hicks is a pioneer in advocating for teaching about the future at all levels of education. This is the extensive work of David Hicks in the United Kingdom summarized by O'Connor and Ramos.

Hicks [14] showed that learning about global futures triggered a distinct psychological process in a student and the five stages of the psychological process were: cognitive, affective, existential, empowered and action. In the first stage, he claimed that students intellectualized the dimensions of global futures, which included learning about concepts and ideas, such as globalization, global issues and challenges. As the student progressed, frustration ensued with the complexity of the issues, and sadness, worry and anxiety followed over the state of the world and their dystopic implications, which were constituted in the affective stage. This often led to re-assessment of the students' own place in the world and challenged their assumptions about their own lives. This existential stage was a potential turning point where students began to integrate their concerns about global futures into their lives. The empowerment stage was where students found sources of inspiration, innovation and renewal that gave them a sense of hope, motivation and direction. In the last stage, action, students were socially empowered to find new relationships, networks, practices, behaviours and projects that addressed their concerns about global futures. [15]

5. Anticipation and Action in Professional Practice

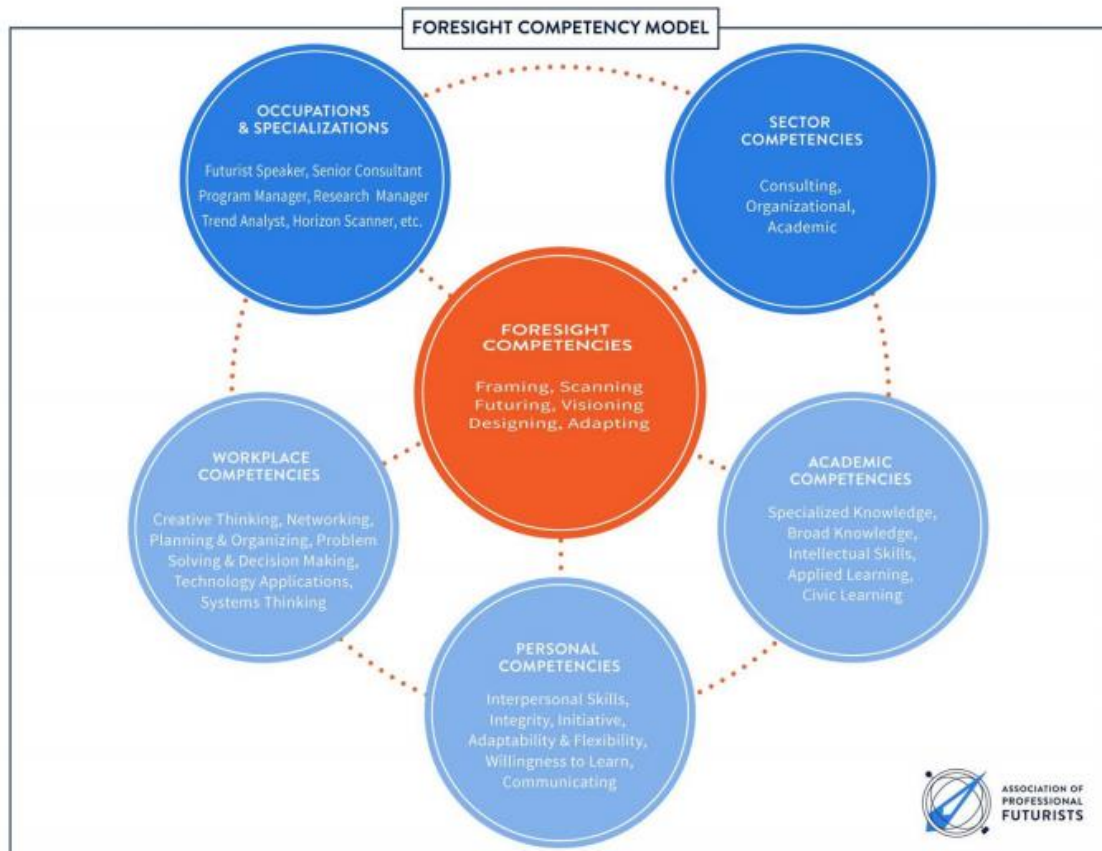
5.1. Association of Professional Futurists

The Association developed a competency model for foresight professionals that mirrors the approach taught in schools.

Figure 5.1.

Foresight Competency Model – 1.1

August 2016



Association of Professional Futurists
<http://www.apf.org>

The six Foresight competencies in the model are Framing, Scanning (Research), Futuring (Forecasting), Visioning, Designing (Planning), and Adapting (Acting). Although some of the terms are different, these are the same six categories in Hines [4].

Of course, these competencies are meant to describe the work of foresight professionals. Nevertheless, they can and should be the foundation for how everyone learns about dealing with the future. Everyone should know how to balance one's bank account, save money, and understand compound interest, though accountants know much more about money and finance than the public does. But they both should know and practice the same basic competencies. [16]

5.2. European Forum on Forward Looking Activities (EFFLA)

Figure 5.2.

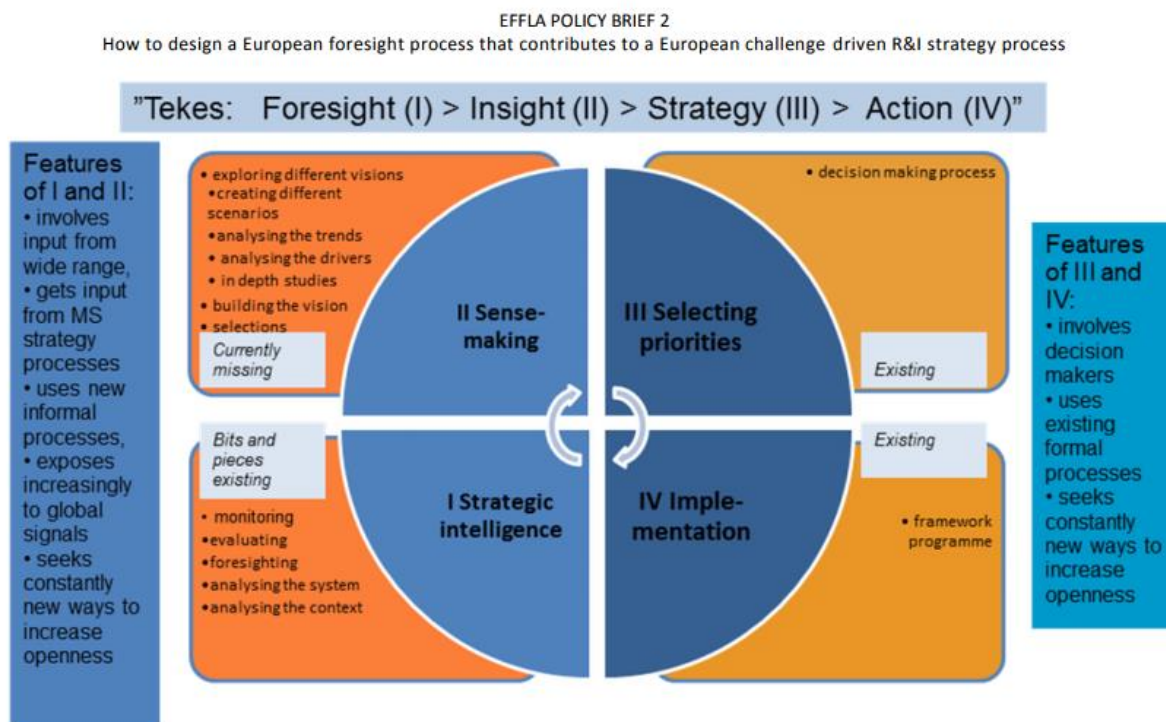


Figure 1. Necessary elements of the future EU strategic process².

Note: Tekes is a Finnish foresight and innovation agency. [17]

5.3. European Foresight Platform

“Three basic functions of Foresight methods can be distinguished:

- Diagnosis: Understanding where we are...
- Prognosis: Foreseeing what could happen...
- Prescription: Deciding what should be done...

“These functions may be confined within particular phases of the exercise so e.g. diagnosis will often be carried out in the beginning while prescription will be done towards the end of an exercise so an exercise might involve the following phases:

1. a phase to understand the current situation (Diagnosis)
2. to continue with a phase to explore what can happen (Prognosis)
3. and to end up the exercise with a phase to define recommendations about what can be done (Prescription)” [18]

Wendy Schultz, a Hawaii graduate, listed her five-step process this way:

- Identifying and monitoring change which is best developed through emerging issues analysis (also known as environmental scanning).
- Critiquing the impacts of change, which relies on the futures tool known as impact analysis.
- Imagining alternative futures which involves Incasting (the deductive forecasting of alternative possible futures).

- Envisioning preferred futures or ideals which involves visioning (an imaginative, idealistic or normative process which aids people in explicitly articulating their preferred future).
- Planning and implementing/achievement phase involves backcasting which bridges the gap between events in a possible future (usually a preferred future) and the extended present. [19]

Richard Lum listed the same process in his 4 Steps to the Future –

- – Past and Present: gathering evidence
- – Futures: using the evidence to forecast alternative futures
- – Aspiration: developing visions, goals and strategies for creating change [20]

6. Conclusion

Based on the review of the various literature, Anticipation and Agency are deeply embedded in the emerging discipline of strategic foresight and in other well-established disciplines. Foresight professionals and academicians in general believe that agents should take the world into account. It would be foolish to set off on a journey without first looking at a map. In the same way, it would be imprudent to attempt to influence the world in any significant way without first taking stock of where the world is and where it might be going. Not doing so assumes that what one knows (or what one thinks one knows) about the world will not change during the change project. That is a rather foolish assumption if the change is significant which will take some time to accomplish.

Annex .A. Naming the emerging field

Early names

As with most new fields, it takes some time for the practitioners and teachers in that field to settle on a common vocabulary, and futures studies is no different. The purpose of this section, therefore, is to explain the different terminologies that have been used to describe this field and to alert the readers to a new attempt to reframe or at least to rename the field as the Discipline of Anticipation.

Marquis de Condorcet, Sebastien Mercier, Jules Verne, and Edward Bellamy were among the first to write explicitly about the future beginning in the 18th century. H.G. Wells did the same in the early part of the 20th century and actually called for “professors of foresight,” but no one took him up on it.

Futures studies, Futures Research, Futurist

Futures studies was first seriously considered a discipline in Europe in the 1940s. Ossip Flechtheim originally called the field ‘futurology’ [22], which is a good title, similar to other ‘-ologies’ like sociology and biology, but it was never accepted. In the 1970s, Jim Dator established the Hawaii Research Center for Futures Studies, and the University of Houston-Clear Lake founded its M.S. program in Studies of the Future. So ‘futures studies’ and the term ‘futurist’ became fairly well established by the 1990s.

Foresight

However, graduates of these programs and others had begun practicing in the field. While many called themselves futurists, they didn’t think of themselves as working in the field of “futures studies.” ‘Studies’ might be a good academic title, like women’s studies and urban studies, but it was a poor title for working professionals. The Romance languages (French, Spanish, Italian, etc.) called the activity *prospective* (French) which is said to imply both aspects of futures studies—understanding of as well as acting on the future. English speakers had no such term so they re-purposed the term ‘foresight,’ which clearly means ‘seeing ahead,’ to include acting ahead as well.

So, by 2000, the field had three terms in common use—

- Futures studies – the academic study of the future
- Foresight or Strategic foresight – the professional practice of helping others understand and influence the future
- Futurist or Foresight professional – the occupation of those who practice foresight in a professional capacity [23]

Annex .B. The Discipline of Anticipation, Futures Literacy, Futures Literacy Laboratories

A new version of futures studies or a brand-new discipline has developed recently. Riel Miller at UNESCO, Robert Poli at the University of Trento, and Pierre Rossel at the Ecole Polytechnique Federal in Switzerland published a paper called “The Discipline of Anticipation: Exploring Key Issues.” [24] The paper was based on the work of Robert Rosen, a mathematical biologist, who developed a theory of anticipation that applied not only to humans, but to every living organism. Quite simply, he theorized that every living system uses an internal model of the world to anticipate future conditions. So even a tree uses the increasing daylight in the Spring to prepare for warmer weather ahead. [25]

As a result, the authors claimed that every academic discipline already had an approach to the future which was not necessarily the same as the futures studies approach. If anything, futures studies was just one way of dealing with the future. They labelled this new approach Anticipation. Poli invited academics from every discipline to a large, successful conference in Trento where they explained how they approached the future using Anticipation.

The DoA [= Discipline of Anticipation] covers all ways of knowing the later-than-now as anticipation, from those forms of anticipation that are observed, for instance, in a tree that loses its leaves in the Autumn to human planning that attempts to colonize the future and efforts to make sense of emergent novelty in the present by finding inspiration in systemically discontinuous imaginary futures. Looked at as a way-of-knowing the DoA addresses the codification of the myriad of systems of anticipation, both conscious and non-conscious. The DoA develops, sorts, and diffuses descriptions of the processes/systems of anticipation or how the later-than-now enters into reality. [...]

Specifically, the DoA provides ideas and tools that can alter and expand the role of anticipation in shaping what humans perceive, including our capacity to make sense of novelty. This is because the theory and practice of the DoA develops and extends the categories and methods of anticipation that can be used to improve discovery and sense making. [...]

Futures Literacy

Miller, Poli and others also associated this definition of Anticipation with Futures Literacy, a competency of “using the future” in three different ways.

The main strength of the Futures Literacy proposal is the distinction among different ways of using the future. As said, anticipation (either explicit or implicit) is a way of generating the of necessity imaginary futures on the basis of probabilistic or non-probabilistic thinking in order to understand and act in the present. Concerning explicit anticipation, three main uses can be distinguished: optimization, contingency, and novelty. [...] The point of distinguishing these three categories is to assist with the challenge of linking specific tasks to specific methods or approaches for both thinking about and shaping the future. Because optimization actively attempts to impose patterns from the past on the future it privileges causal-predictive methods, often implemented through formal (usually algorithmic) models running historical data. Contingency planning is how we try to prepare for already recognized possible surprises (often with the aim of surviving or continuing without systemic disruption). Using novel futures to discover new ways of making sense of the emergent present

provides one way of taking advantage of the unknowable as it starts to become knowable, enhancing the capacity to discover the present. Novelty includes objects and processes emerging from our activities and the subsequent actions we exert upon and with them. [...]

The distinction among the three ways of using the future is meant to be analytical. It does not imply that at any given time people, communities or institutions individually use only one of them. As a matter of fact, all the ways of using the future are usually employed together, in different proportions. The analytic distinction into three main types is a conceptual tool for better classifying and understanding the way in which communities and other relevant subjects use the future.

Futures Literacy Laboratories

A third element of this movement is the Futures Literacy Laboratory. Each Laboratory is a day-long exploration of the future with participants from or related to an institution that has an interest in the future. Topics have varied from education, to work, to governance. Miller has conducted more than 30 such labs through the world since 2012.

Futures Literacy in the title implies that all three ways of using the future would be covered. In fact, the agenda from at least two of these Labs in shows that the first two ways of using the future (optimization and contingency planning) are mentioned in a lecture, the real work of the laboratory is to use the third method, novelty.² The expected and preferred futures are covered in the beginning of the Laboratory, but more to put them aside so that the participants can investigate “another way” the future might occur that is unrelated to any of these or to any evidence or assumptions. The objective is a fresh look at the future to uncover assumptions and reframe the present.

Transforming the Future: Anticipation in the 21st Century

Miller and his colleagues at UNESCO are working on a publication that describes the Discipline of Anticipation, the concept of Futures Literacy, and the experience of the Futures Literacy Laboratories. The book and all of these elements are describes in this video – <https://www.youtube.com/watch?v=Q8Gee0IhksU>.

Conclusion

Any scholarly or professional work on the future is indeed welcome. However, there appears to be a sense in this initiative that the authors want to redefine the field of futures studies. Such a redefinition might be valuable, even necessary, but it might also create confusion about the difference between traditional foresight/futures studies and this new discipline /competence. Is there a difference? Are these elements really new?

This author, for one, believes that the two are actually quite similar.

² Bogata (http://4cf.pl/dokumenty/raport_unesco_fl.pdf); Bangkok

(http://www.unescobkk.org/fileadmin/user_upload/epr/Foresight_Workshop/Foresight_Workshop_Revise_d_Report_Dec21.pdf); Sao Paulo (<http://www.pucsp.br/icim/ingles/downloads/Workbook-Futures-Literacy-23072013.pdf>)

Table 2.

Discipline of Anticipation	Foresight and futures studies
Understanding ways that members of every discipline uses the future in that discipline.	Some disciplines do use the future in explicit ways. Most of those are based on scientific, mathematical models, such as engineering, medicine and economics. Business uses creativity techniques to produce novelty. Most others simply rely on the intuitive grasp of the future by smart and insightful people.

Table 3.

Futures Literacy	Foresight and futures studies
Three ways of using the future optimization, contingency planning and novelty	"Three futures" have been a core of futures studies since Roy Amara describe the probable, possible and preferable futures in <i>The Futurist</i> in 1981. [26]

Table 4.

Futures Literacy KnowLabs	Foresight and futures studies
Some introduction the Futures Literacy as described above, the point of the Lab, however, is to go beyond existing assumptions of a domain as a means to see that domain differently in the present and make better decisions and take more effective actions in the present.	Creativity and visioning workshops are a common practice of foresight professionals. One notable example was the Horizon Mission Methodology in which NASA engineers would imagine an "impossible" mission, and then work backwards to what research today would work toward accomplishing that mission. [27]

Dr. Miller and his colleagues have introduced serious thinking about the future to many people and institutions over the last few years. They also seem to be attempting to redefine the field of futures studies and strategic foresight. They well might do so using the prestige and power of UNESCO. Whether they do so and whether that ends up being beneficial to people who need to anticipate and influence the future is yet to be determined.

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