

Education for human flourishing

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Contents

- 2 Introduction
- 3 Education purposes
- 6 Conceptualising education for human flourishing
- 8 Education for human flourishing – competencies and assessment
- 11 Where has this taken us?
- 12 Education for human flourishing – how people learn
- 14 Education for human flourishing – trajectories for system design
- 17 Conclusion



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Introduction

The High Performing Systems for Tomorrow (HPST) project was established in 2018 for jurisdictions that achieve outstanding results in the Programme for International Student Assessment (PISA), and which share a commitment to exploring the next frontiers in education, for their own countries and the world. The project proceeded through two complementary strands:

- comparative research into existing learning systems; and
- policy dialogues, for Permanent Secretaries or their equivalent, on the implications of artificial intelligence for the future of education.

A key outcome of these dialogues, encapsulated in a series of OECD papers, was new thinking on the purposes of education. Broadly, countries concluded that education in the 21st century should support the concept of human flourishing.

In the second phase of the project, beginning in 2022, an expanded set of jurisdictions will consider education for human flourishing in detail. Why should education purposes be re-thought?

How might learning, teaching and assessment be reshaped to help fulfil these new purposes? How should education systems evolve as a result? The aim is to create a robust conceptual framework that informs policy development in secondary education for interested countries and steers the long-term direction of PISA.

This paper synthesises the thinking in Phase One and provides a focus for Phase Two. After an opening reflection on societal goals and the priorities for education systems, it presents the concept of Education for Human Flourishing. It then discusses underpinning orientations; three competencies that people might need; the opportunities for assessment; and potential directions for how people should learn. The final section suggests trajectories for education system design.

Developments in artificial intelligence (AI) will continue to shape this work. AI is already helping us to strengthen the **processes** of education, in the classroom and other settings. More fundamentally, it is challenging us to broaden the **human repertoire**.

Education purposes

The origins of education lie in the ancient world. In both the western and eastern traditions, education equipped a small minority of people with knowledge and understanding, capacities to contribute to the civic sphere and the interests and accomplishments that make life fulfilling.

Modern education systems, since their emergence in the 18th century, have continued to recognise the value of individual fulfilment. At the same time, by nurturing shared understandings of citizenship, interdependence and mutual interest, they have sought to build cohesive societies: democratic values and processes and inclusive social and economic institutions are the legacy of education's 'nation-building' function.

Education and employment

In the industrial era, a central responsibility of education systems has been to equip people for the labour market. In their classic analysis of education and the economy in the United States since 1900, Goldin and Katz examine the capacity of the American system to ensure that the supply of educated people outstrips the demand for educated people caused by technological advances. They note that a corollary goal of education, reflecting its egalitarian 19th-century origins, has been to spread opportunity and narrow economic inequality across the population. They show that when education outstripped technology, between 1900 and 1975, economic inequality decreased, but when technology outstripped education, between 1975 and 2000, economic inequality increased. They point to a similar trajectory in other major economies (*The Race between Education and Technology*, 2009).

Over the last forty years, policymakers around the world have sought to increase

the supply of educated people, through a broadly shared approach: an orientation toward science, mathematics and problem solving within a broad curriculum, a commitment to helping all students perform well irrespective of background (equity), and the expansion of higher education.

Those years have seen remarkable economic growth, but at the expense of the earth's climate, natural resources and biodiversity. Economic inequality has increased. Flatlining science results in PISA 2006 and 2015 suggest that the supply of educated people has not kept pace with technological advances. Most countries have struggled to close the equity gap.

A related problem has emerged. Schools have long served as a gateway to tertiary education by sifting students through examinations. Recently, in many countries, college degrees have themselves become a signalling system, enabling employers to sort and remunerate applicants according to the prestige of the institution from which they graduated.

In this way, Sandel argues in *The Tyranny of Merit* (2020), education determines winners and losers in a starkly divisive meritocracy. Those who succeed may have applied themselves and, to that extent, merited their success, but they are also fortunate to be born with the skills that society values. He notes that in the United States and other countries, in protest against excessive inequalities, the decline of their communities and a personal loss of social esteem, those who do not succeed in education form the electoral base of populist politicians.

In *The Aristocracy of Talent*, Wooldridge (2021) absolves the **principle** of meritocracy. People should get ahead, he argues, not through nepotism or patronage but their natural talents, with a system that provides education for all, forbids discrimination and awards jobs through open competition. But he concedes that the recent **implementation** of meritocracy has

been flawed, not only because educated elites have proved effective in engineering opportunities for their children, but also because the measure of merit has become excessively narrow, strongly favouring cognitive skills above caring and craft skills.

Education is at a crossroads. Commentators agree that the promises of fairness, equity and social mobility have not been kept, but whereas some call for the reinvention of education processes and institutions, others make the case for discipline, memorisation and other recipes that have succeeded in the past.

... as humanity moves into the mid-21st century, we face profound, specific challenges. Are a compass and tools to navigate enough? Is it time to recast the purposes of education – and link it back to human flourishing?

It would be wrong to imply that schools are standing still. In many countries, the learning experience they offer has evolved significantly, with important new emphases on a broader interdisciplinary curriculum, the development of social and emotional skills, and the acquisition of attitudes and values. Since the pace of change is so rapid and our understanding of what lies ahead necessarily limited, it is no longer appropriate to see education as an instrumental process preparing students for a known future. Instead, schools are increasingly helping them develop a reliable compass and useful tools to navigate through uncertainty.

However, as humanity moves into the mid-21st century, we face profound, specific challenges. Are a compass and tools to navigate enough? Is it time to recast the purposes of education – and link it back to human flourishing?

Education for human flourishing

First, we need to prepare young people to re-orient themselves to the world that has emerged in recent decades. The creation of wealth through productive work will continue to be the engine of our societies and economies. But as Raworth argues in *Doughnut Economics* (2017), the moral space for economic activity has narrowed: it lies between a social foundation beneath which no one should fall and an ecological ceiling above which the earth will be further degraded.

Second, we need to prepare young people for a world in which artificial intelligence may equal and perhaps surpass our own.

Artificial intelligence is the defining technology among a family of technologies, spanning robotics, the Internet of Things, nanotechnology, biotechnology, materials science, energy storage and quantum computing.

An AI system is a machine-based system that can, for a given set of human-defined objectives, make predictions, recommendations or decisions influencing real or virtual environments. It uses real or machine-based inputs to perceive real or virtual environments, abstract such perceptions into models; and uses model inference to formulate options for information or action ... AI take up is accelerating rapidly in sectors where it is possible to detect patterns in large volumes of data; and model complex, interdependent systems to improve decision making and save costs.

(OECD, 2019, *Artificial Intelligence in Society*)

It is machine learning that has galvanised AI. If the definition of intelligence is the capacity to achieve one's objectives, then it is thanks to machine learning that robots can now achieve the objectives that humans set them in defined fields of

activity (Russell, in his *BBC Reith Lectures* series, 2021). The near-term impact may prove dramatic, on work and on what it means to be a human.

The impact of automation on livelihoods is disputed. Some argue that jobs are usually automated only in part and that the effect of partial automation is both to increase the productivity of the original job and create new jobs altogether. Others contend that newer forms of automation, such as Amazon's storage and delivery revolution, **replace** economic activity, with little compensatory job creation.

The impact of AI on the way we make decisions is likely to be transformative. In the political sphere, algorithms are already used to target specific categories of voter with specific messages. In *Homo Deus*, Harari (2015) suggests that future citizens may delegate their political rights to an artificially intelligent agent, which remembers their prior choices and the circumstances in which they were made, interprets them in the light of patterns in **everyone's** choices and circumstances – and casts a vote accordingly. In the consumer sphere, he envisions an agent that remembers every product preference ever expressed – and makes the next purchase for us.

AI, then, is already encroaching on important dimensions of personhood – but this is merely Narrow AI, the capacity of machines to solve the problems humans set them in defined fields of activity. General Purpose AI, the capacity to learn, generalise and apply knowledge across multiple fields of activity, would significantly accelerate these effects. Harari foresees an inflection point in human history.

An external algorithm that monitors each of the systems that comprise my body could know exactly who I am, how I feel and what I want – replacing the voter, the customer and the beholder ... People will no longer see themselves as autonomous beings

running their lives according to their wishes and instead become accustomed to seeing themselves as a collection of biochemical mechanisms that is constantly monitored and guided by a network of electronic algorithms.

(Machine Learning and Human Intelligence: The Future of Education in the 21st Century)

This is a bleak picture, but it is not inevitable. After all, the effects of digital technologies are not pre-determined: it is our collective response to disruptions that will determine their outcomes. We have the power to shape AI, to align it to human purposes and priorities, and to address with its help precisely the societal challenges described above.

How might humans develop their intelligences, not only to exceed machines but direct and complement them? Luckin argues that both humans and machines deploy cognitive/analytical intelligence to solve problems, but that only humans understand that knowledge is dependent on context and that different viewpoints must be evaluated in order to reach conclusions. Humans differ fundamentally from machines in our social intelligence (the capacity to know others) and our meta-intelligence (the capacity to understand oneself, as a learner and in relation to others, the situation and the environment) (Luckin, 2018).

Here then is a second perspective on education for human flourishing. Education should enable us to flourish in the coming age of machines.

Education for human flourishing does not replace the education we have today. It rebalances it in the service of a broader idea: to nurture, in every human being, a suite of distinctive human intelligences, which equip us not only to flourish as individuals but also to contribute to flourishing societies and economies, in balance with the planet.

Conceptualising education for human flourishing

Kristjan Kristjansson, a leading authority on Aristotle, makes two important claims in *Flourishing as the Aim of Education* (2019): that human flourishing is the purpose of our existence; and that human flourishing consists of

- moral, reason-infused activities that are meaningful to the individual and have some consequence in the world
- contemplation, and
- awe.

In emphasising meaningful activities and contemplation, Kristjansson follows Aristotle directly. His emphasis on awe is an interpretation of Aristotle's wider thinking.

The argument for combining scientific and moral reasoning has a special resonance in our times: many of our problems intertwine the two. What Aristotle meant by contemplation is the intellectual capacity to derive principles from observation of the physical world (wondering **about** the world). Kristjansson thinks contemplation leaves space for awe (wondering **at** the world, from sublime sunsets to crystals seen through a microscope). From a modern perspective, however, two dimensions of human flourishing still need adding to the picture.

The first concerns what a flourishing person **is**, as opposed to what a flourishing person **does**. A flourishing person is

achieving their highest potential – being the best that they can be. They may do so by the exercise of moral and scientific reasoning, contemplation and awe, but they choose where and how to apply these processes, in a specific setting or role with a personal goal. In Maslow's Hierarchy of Needs (1943), this is 'self-actualisation'.

The second dimension concerns the relationship between individual and societal flourishing. Recent crises and controversies show how nuanced the relationship has become.

- Some people flourish by denying equality of opportunity, support – and ultimately social justice – to people of other races, as Black Lives Matter has underlined. Flourishing individuals help ensure that **everyone flourishes, today**.
- Biotech could restrict physical and mental enhancement to only the rich, unless we regulate now to make it widely available. Here, there is a burden on the flourishing individual to help ensure that **everyone flourishes, tomorrow**.
- During the industrial age, humans have burned the earth's resources, causing climate change. In this case, flourishing individuals help ensure that everyone flourishes tomorrow by **giving equal weight to human and planetary flourishing**.

Human flourishing is the purpose of existence in the modern world only to the extent that situational values are in harmony with collective, sustainable values.

Orientation

The OECD 2030 learning framework, published in 2018, sets wellbeing as the goal of education and co-agency as the guiding orientation. Agency, a concept borrowed from the social sciences, refers to the capacity of individuals to act independently and to make their own free choices. It encompasses the ability to draw appropriately on past patterns of thought, to imagine possible future trajectories of action and to make good judgements about which course to choose, according to the situation. Co-agency indicates that individuals should, where possible, think and act with others. The value of the concept in education is clear. It moves the centre of gravity from knowing to doing, and specifically to doing good.

Human flourishing is a more aspirational term than wellbeing. Is there a related orientation that builds on co-agency but better reflects the challenge of fulfilling one's highest potential, so that young people are equipped not only to foresee and forestall urgent problems but also to imagine, envision and shape a world in which humans continue to flourish?

The challenges that confront 21st century societies are existential. Is the flourishing person someone who finds their highest potential in helping to resolve them? This goes beyond *future readiness* and even *futures literacy*. It is a capacity to support *future transformation*.

Leadbeater sees co-agency in education as finding one's purpose through learning. Students should go to school to become 'purposeful, reflective and responsible' people, who can see what needs to be done and set about doing it.

Purpose is a bridge between identity and interest ... a real sense of purpose is anchored in identity (who we are, what matters to us), intent (what change we want to bring about) and action (how can we make this change actionable?).

(Leadbeater, 2021, *Learning on purpose*)

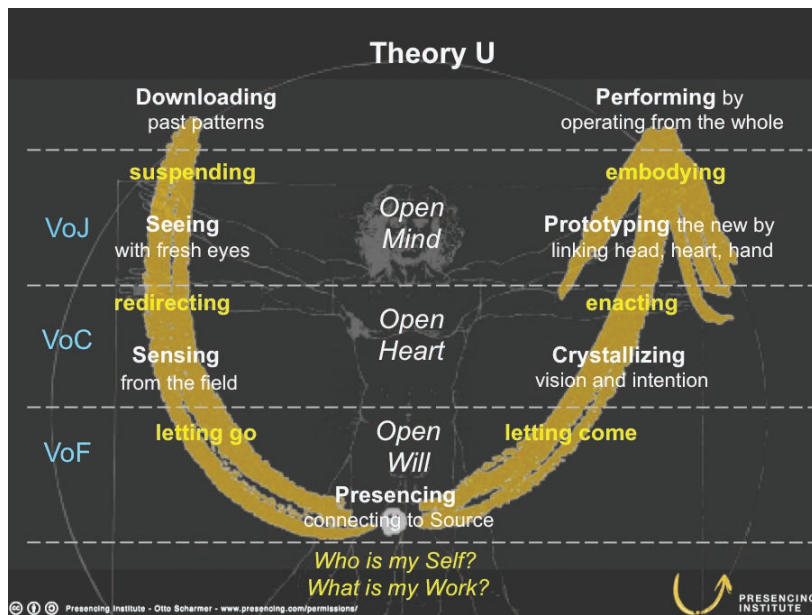
Here, agency is individual, collaborative and collective and, although the primary suggestion is that people make a greater difference in the world when they work with others, there is also an implication that educators should equip not only individuals with the competencies they need, but groups, communities and societies too: in other words, that educators should build collective competency.

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Theory U¹ is a conceptual framework for leaders, inviting them to close the ecological, social and spiritual divides between self and planet, self and others, and self and self. Grounded in the theory and practice of awareness-based system change, it proposes that changing the self is a means to changing systems; that the system is not an extraneous entity but us ourselves; and that the most important change occurs in underlying paradigms of thought. Listening is a fundamental tool: especially empathic listening, which puts the listener in the other person's shoes; and generative listening, when new understandings are conceived through the process of listening together (Scharmer, 2016, *Leading from the Emerging Future*).

Theory U contrasts ‘absencing’ and ‘presencing’. The first is characterised by ignorance and bias, hatred and cynicism, and fear and fanaticism; the second by curiosity, compassion and courage. Presencing (see Figure 1) accesses deeper sources of personal creativity in order to co-sense and co-direct the emerging shape of the future.

Figure 1. The U process of co-sensing and co-creating – Presencing



Source: en.wikipedia.org/wiki/Theory_U.
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Leaders are invited to actualise their highest future possibility by journeying, with others, through processes of deep observation, self-reflection and rapid prototyping, in order to create the organisational models of the future.

For leaders, read learners. The same creative and spiritual journey could both characterise a young person’s education as a whole and provide a culminating, project-based learning experience. Finding individual and collective purpose through learning, to help support future transformation, can orient education for human flourishing in the contemporary world.

Education for human flourishing – competencies and assessment

The next step is to identify some specific, assessable competencies that could equip people to flourish as individuals and, through an orientation to future transformation, contribute to flourishing societies. The original PISA definition of competencies provides support for this approach.

Competencies contribute to valued outcomes for societies and individuals; help individuals meet important demands in a variety of contexts; and are not just for specialists but for all individuals. They combine knowledge, skills, values and attitudes.

(OECD, 2005, *Description and Selection of Competencies*)

At the same time, we are looking for competencies that draw on distinctive human intelligences, either singly or in combination, allowing us to exceed, direct and complement machines.

The assessment of these competencies should enable continuing understanding of the learning of each student, to guide that student’s ongoing development. Teachers are more likely to build competencies into their teaching if they are confident of being able to assess them in the classroom; new technologies are emerging that facilitate such assessment; and it could scaffold assessment at school, national and international levels. At its best, assessment is **useful** because it allows learners, educators and employers to recognise precisely what level of competence has been achieved, potentially evidenced by micro-credentials; **integrated** in the sense that it is embedded in a digital learning

environment; and, above all, **rigorous**, in that it proceeds by asking the following series of questions, within a framework known as ‘principled assessment design’.

- What knowledge, skills and attitudes do we want to assess?
- What are their measurable features?
- What criteria and rubrics can be designed to score them?
- What kinds of tasks elicit or probe them?
- What task specifications guide assessment assembly and administration?

The High Performing Systems for Tomorrow project has identified three potential competencies, each with a suggested approach to assessment, which might underpin education for human flourishing. They are

1. adaptive problem solving
2. ethical decision making, and
3. aesthetic perception.

Adaptive experts are capable of varying their behaviours and understanding to address new challenges and situations. They do this by applying what they have learned in one context to another context, drawing on higher-order thinking and decision-making skills, in order to solve complex problems.

The first reflects Aristotle’s emphasis on rationality and contemplation of the external world; the second his commitment to moral thinking; and the third his interest in nurturing a sense of awe. These competencies together hold out the prospect of a life that is meaningful to the individual and contributes significantly to better societies and economies. They all draw on intelligences that are and may remain the domain of humans: higher cognitive intelligence, social intelligence, and meta-intelligence.

Adaptive problem solving

The OECD Survey of Adult Skills has incorporated adaptive problem solving in its current cycle. The PISA Governing Board is considering a proposal to assess adaptive problem solving as an Innovative Domain.

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The PISA assessment strategy would explore the extent to which students, drawing on ICT skills, can mobilise multiple competencies in tandem to solve problems. They could be asked to

1. solve a design problem, to demonstrate creative thinking, critical thinking, decision making and self-regulation
2. research, verify and communicate a series of statements, to demonstrate critical thinking and synthesis skills in evaluating information, and
3. judge when and how to collaborate with others, to demonstrate interpersonal skills.

Principled assessment design and a digital environment would be integral to constructing this assessment. Dividing it into different challenges, to demonstrate different knowledge, skills and attitudes, would facilitate the use of micro credentials.

Ethical decision making

Ethics is central to human flourishing, equipping us to evaluate and respond to the claims that others make on us. An ethical perspective combats prejudice against people with identities different to our own and balances the needs of the

human race with the rights of other species and the planet itself. It is the ability to make altruistic choices that distinguishes human decisions from those made by machines.

The Wisdom Task Force,² meeting in Toronto in 2019, embedded ethical decision making in its account of wisdom. The central idea is ‘perspectival metacognition’, combining

- intellectual humility
- the ability to balance diverse viewpoints, perspectives and contexts, and
- an orientation toward the common good and shared humanity.

The suggested strategy for assessing perspectival metacognition is to measure learners’ capacity to reason, in discussion with a trained expert, about personal dilemmas. To what extent do they exhibit humility; an ability to balance viewpoints, perspectives and contexts; and an understanding of conflict resolution and compromise? Expertise in handling personal dilemmas could lay a foundation for contributing to civic and political debate, on issues with an ethical dimension.

By comparison with adaptive problem solving, the conceptualisation and assessment of ethical decision making are at an early stage. It is not yet clear whether the difficulty of dilemmas could be adapted to different participants; what kind of associated data would best indicate the processes that participants follow in formulating their responses and their degree of persistence; or on what evidentiary basis the data might be interpreted. On the other hand, the presentation of the dilemma and the development of the participant’s responses could clearly take place in a digital learning environment; and specific skills and behaviours could be individually recognised with micro credentials.

Aesthetic perception

Through aesthetic perception we appreciate the sublime: what is magnificent, mysterious and greater than ourselves. By setting the everyday, however dismal, in perspective, the sublime consoles us. By opening up our spiritual selves it offers transcendence. By connecting us to the highest human achievements and the natural grandeur of the universe, it enriches our concept of human flourishing.

Gardner defines aesthetic perception in terms of appreciating (rather than creating) beauty. He sees beauty as a property of experiences. To count as beautiful, ‘an experience must be interesting enough to behold, have a form that is memorable and invite revisiting’. Looking at a picture, listening to a story or attending a concert are all examples. So too, potentially, are taking a shower or enjoying the walk home. In *Truth, Beauty and Goodness Reframed: Educating for the Virtues in the 21st Century*, he argues that, by training young people in aesthetic perception, we help them distinguish between categories of beautiful experience; build a personal, changing portfolio of beautiful experiences; and articulate their reasons for identifying these experiences as beautiful (Gardner, 2011).

Can aesthetic perception be deconstructed into knowledge, skills and attitudes?

Recent research investigates what people do when they engage with an artwork.

According to the Vienna Integrated Model of Perception (Pelowski et al, 2017), there are the following three distinct phases:

- Pre-classification. This is the viewer’s prior state on approaching the artwork: contextual knowledge, mood and emotions, and a sense of the significance of the experience ahead.
- Bottom-up processing. This involves identifying simple visual features such as colour intensity and basic structure;

combining core elements into cohesive patterns; and selecting aspects that evoke memories and suggest meaning.

- Cognitive mastery. This is about interrogating one's cognitive response to the artwork and attending to its impact on one's ideals, emotions and actions. To what extent is the way the artwork frames the world congruent with the viewer's framing of the world? And is it relevant to the viewer?

It would be possible to assess the quality of the viewer's engagement by asking them to articulate responses to the congruence and relevance questions, and by comparing their responses to hypothetical answers. The assessment might consider not only verbal but also emotional and physiological responses.

An assessment like this could be part of a credentialed learning process, where the learner comes to understand through a teacher's guidance how to engage with an artwork, or aesthetic experience, as a means of reflecting on the self. It could equally be embedded in a digital environment, where the learner responds to digital images, receives guidance and feedback, and provides process data.

Meeting the standards of principled assessment design could be more challenging. Is it possible to infer from what a learner says they think and feel about an artwork what they really think and feel? How would process data relating to emotions and physiological responses be related to what is said, and on what evidentiary basis?

Where has this taken us?

Starting from a conceptual framework for human flourishing based on Aristotle, we have now drawn out some initial implications for education in the 21st century: an orientation to finding one's purpose through learning in a way that supports future transformation; and three potential competencies (with related assessments approaches) that not only map on to Aristotle's analysis of what flourishing people do, but also mobilise distinctive human intelligences.

All three of the suggested competencies build on deep disciplinary knowledge, skills and attitudes, in the sciences, social sciences and humanities, and a range of cross-cutting skills, including the social and emotional. They are not substitutive. Equipped with competencies in adaptive problem solving, ethical decision making and aesthetic perception, young people can shape their prior learning and orchestrate it to serve broader objectives.

What basis is there for believing that people equipped with these competencies could contribute to the transformation of their communities, societies and economies? It may be this broader contribution that justifies the interest of education systems in the concept of human flourishing.

Adaptive problem solving is closely related to the idea of innovation as the route to new value. At different speeds and with different emphases, economies around the world have become more innovative and entrepreneurial, in pursuit of growth and increased productivity. Critical to their success will be people who think creatively about the development of new products, the introduction of new enterprises and the deployment of new business models.

The imperative of reconciling diverse perspectives and interests, in a structurally imbalanced world, will require young people to become ethical decision makers, adept in handling tensions, dilemmas and trade-offs. The sphere in which they do so may be the family; the community; or the workplace. An ethical perspective on relationships with customers, colleagues and competitors, on the social value of products and services and on the wider impact of producing them, will be an increasing dimension of economic activity.

For life and work, tomorrow's young people will need to be innovative, responsible and sensitive to the sublime. They will be the creators of the products, services and models of the future. They will be alert to the claims that others make on us. They will be open to the deepest emotions that human life confers.

A sensitivity to what is beautiful is the most 'inward' of the competencies. It will be a vital source of depth, perspective, compassion and awe: inner resources that strengthen the individual in dealing with the external world.

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Education for human flourishing – how people learn

The learning environment is

... an organic whole that embraces the experience of organised learning for given groups of learners around a single pedagogical core.

(OECD, 2017, *The OECD Handbook for Innovative Learning Environments*)

- It recognises learners as its core participants, encourages their active engagement and develops in them an understanding of their own activity as learners.
- It is founded on the social nature of learning.
- The learning professionals within it are attuned to the learners' motivations and the key role of emotions in achievement.
- It is sensitive to individual differences between learners, including their prior knowledge.
- It devises programs that demand hard work and challenge from all, without excessive overload.
- It operates with clarity of expectations and deploys assessment strategies consistent with these expectations; there is a strong emphasis on **formative** feedback to support learning.
- It strongly promotes horizontal connectedness across areas of knowledge and skills, as well as to the community and the wider world.

A learning environment that acknowledges the differences between learners, the impact on them of motivations and emotions, and the power of formative feedback encourages individual flourishing. A learning environment that emphasises social learning, and connects learners to the community and the world, enhances the individual's contribution to flourishing societies and economies.

The OECD Innovative Learning Environments project argued that students should learn through a mix of guided learning, active learning and experiential learning. Stanislaus Dehaene, on the other hand, in *How We Learn: the New Science of Education and the Brain* (2020), contends that active learning is better suited than guided or experiential learning to supporting human development. The brain, he says, adjusts the parameters of a mental model; exploits a combinatorial explosion; minimises errors; explores the space of possibilities; optimises a reward function; restricts the search space; and projects *a priori* hypotheses. Like a scientist, it chooses the theory that best accounts for the available data. Education accelerates brain development by monitoring the progress, difficulties and errors encountered in learning. The learning experience should

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therefore be structured around the following four processes.

- **Attention**, which amplifies the information the brain focuses on.
- **Active engagement**, which encourages the brain to test new hypotheses.
- **Error feedback**, which compares the brain's predictions with reality and corrects its models.
- **Consolidation**, which automates what we have learned.

This is **active learning**: within a rigorous conceptual framework and stimulated by rich inputs, students develop propositions and receive feedback in order to shape and refine their understanding.

A new generation of education software is deploying active learning approaches. Particularly in mathematics and sciences, intelligent tutoring systems use AI to offer individual students an optimal step-by-step pathway through learning materials and activities, providing feedback and adjusting the level of difficulty. These systems are sometimes criticised for providing a computerised version of guided learning. In fact, the best follow Dehaene's action learning sequence to the letter (attention, engagement, error correction and consolidation).

Active learning is clearly a powerful learning strategy in the sphere of adaptive problem solving. It may be valuable too in nurturing ethical decision making, as students develop personal frameworks and principles through trial and error. In the case of aesthetic perception, active learning could allow students to build their own portfolios of beautiful experiences. However, experiential learning may be equally important, especially in giving opportunities for students to engage creatively, emotionally, socially and physically.

Education for human flourishing – trajectories for system design

It remains to consider what education for human flourishing might mean for the design of education systems.

A number of recent frameworks conceptualise complex education systems by analysing their component parts and the relationships between them. An outstanding example is the work of the National Center on Education and the Economy (*Blueprint for a High-Performing Education System*, NCEE, 2020).

Equity policies would be designed less to help everyone achieve the same thing, expressed as a single set of minimum education requirements. They would be designed more to help everyone find their purpose through learning, combining aspirations and distinctively human competencies in order to make a different, personal contribution to future transformation.

Education for Human Flourishing is consistent with these analyses and builds on them, but it shapes the nature of some component parts and suggests priorities among them. For example, the proposed orientation, competencies, pedagogies and assessments shape the nature of the learning system and place even greater priority than before on the recruitment, training and development of teachers.

In addition, education for human flourishing implies some overarching trajectories, with consequences for the values, dynamics and ambitions of education systems. Among these are a re-examination of the concept of equity, a step change in the design and use of AI-based

education technologies, and the adoption of eco-systemic approaches to system thinking. Why might these be important in advancing education for human flourishing? What do they entail? What would it take to reconcile them within a single strategy?

Equity

There is widespread agreement that equity policies in education, designed to provide a level playing field for all, irrespective of background, have fallen short. Between PISA 2009 and PISA 2018, only six countries narrowed the performance gap between their most disadvantaged and most advantaged students. In his 2021 paper for this CSE series, *The right drivers for whole system success*, Michael Fullan argues that simply investing more in interventions such as early years provision and targeted allowances will not be enough. He calls for 'equality investments', including redistributive macro-economic policies.

Education for human flourishing increases the moral onus on creating a level playing field: contemporary human flourishing is for everyone, or it is for no-one.

Education for human flourishing recognises and celebrates the diversity of human identities, in relation for example to race, indigenous populations, sex, gender and their intersections. Equity policies should maximise not only equality but also diversity, with an emphasis on fairness (treating people differently, according to need, in order that they can pursue their goals) and inclusion (countering disadvantage by connecting learners through integrated peer-groups and cross-group friendships).

Above all, education for human flourishing redefines what, irrespective of background, people might look to achieve on a level playing field. Equity policies would be designed less to help everyone achieve the same thing, expressed as a single set of

minimum education requirements. They would be designed more to help everyone find their own purpose through learning, combining aspirations and distinctively human competencies in order to make a different, personal contribution to future transformation.

AI-based education technologies

Education for human flourishing proposes challenging goals for what people should learn. The suggested competencies all depend on significant prior learning, in many disciplines, across a wide range of knowledge, skills, attitudes and values. Adaptive problem solving significantly extends current expectations in the area of problem solving. Ethical decision making and aesthetic perception represent major new directions. Placing these competencies at the centre of what people learn implies a step change in learning environment design and places a greater premium still on the expertise of teachers.

The competencies flow in part from the threats posed by AI to societies, economies and individuals. Yet, if it is true that we have the power to shape AI and align it to human purposes and priorities, then we have a particular opportunity to strengthen teaching and learning by shaping the development of AI-based education technologies.

The contribution of today's intelligent tutoring systems to personalised education, offering rigorous disciplinary learning in maths and science through action pedagogies and formative assessment, has already been discussed. These systems are algorithmic, but they do not yet capitalise on machine learning.

Rose Luckin from the UCL Knowledge Lab, has argued, in a *Financial Times* article, that machine learning will offer us a full 'intelligence infrastructure'. It may be possible to extend, develop and measure the complexity of human intelligence by

analysing how the student articulates a process such as photosynthesis; tapping into, evaluating and galvanising the student's meta-intelligence; and gauging the student's ability to deal with a complex social situation (Luckin, 2020).

Shute et al (2021) are more cautious but believe that the analysis of large volumes of student learning data could reveal the cognitive and behavioural patterns exhibited by successful learners, by competence. Subsequently, it could be possible to identify each student's learning processes and behaviours; diagnostically assess their strengths and weaknesses; and provide unique and individualised cognitive and affective supports as needed. In time,

Machine learning could also inform our understanding of effective education systems – and therefore benchmark and compare their relative performance – by analysing the relationships, processes and behaviours among different system actors. ML-powered systems could be used at group level for data-driven decision making purposes ... (and) ... in this scenario, the unit of analysis is not a student; rather it is a larger entity made up of students, teachers, educators, parents, administrators and other stakeholders. Data from all these sources could be used to develop ML-based models to inform policy makers' decisions.

(Shute et al, 2021, *Machine Learning*)

Eco-systemic approaches to education

Over the last twenty years, eco-systemic approaches to education, in support of knowledge building, innovation or learning, have been widely discussed. More recently, local (place-based) learning ecosystems have received renewed attention. They typically involve organisations with shared capacities in the provision of education, such as businesses,

museums, libraries and local government, uniting to provide pathways through formal, informal and non-formal learning, often using innovative pedagogy and credentialling.

Writing in *Back to the Future of Education: 4 OECD Scenarios for Schooling* (OECD, 2020), Tracey Burns presents the eco-systemic scenario as an alternative to schooling that retains current structures and processes, schooling that is outsourced to diverse, privatised and flexible providers, and ‘learn-as-you-go’, in which traditional schooling is replaced by everywhere, anytime learning using education technologies. She describes schools that take an eco-systemic approach as learning hubs.

Diversity and experimentation have become the norm. Opening the school walls connects schools to their communities, favouring ever-changing forms of learning, civic engagement and social innovation.

(OECD, 2020)

Learning ecosystems that already exist in OECD countries range from regional partnerships that support the traditional local school system (USA), through municipal networks linking schools, resource providers and cultural institutions via an integrated technology platform (Finland), to an integrated talent and innovation ecosystem under development in the north of England.

There are three reasons for supposing that local learning ecosystems might facilitate education for human flourishing. The first is that they bring to bear bigger, wider and more diverse resources, from the civic, cultural and business sectors, which could help people acquire exacting new competencies such as problem solving, ethics and aesthetics. The second is that they hold out the prospect of supporting a larger population of learners, who continue to learn throughout their lifetimes. The third is that they facilitate the pursuit of new social and economic goals, under the

umbrella of human flourishing. As Luksha shows in a recent survey of learning ecosystems, these goals may include secure and meaningful employment in priority areas of the economy; health and wellbeing; and renewed trust and civic engagement.

However, if each trajectory individually could contribute to education for human flourishing, there are nevertheless significant tensions between the three.

For example, AI-based education technologies could either strengthen equity and opportunity or undermine them. HolonIQ³ offer a range of perspectives on the future of learning and technology in the period up to 2030. The ‘No Change’ scenario would squander the chance to capitalise on technology’s unrealised potential. ‘Peer-to-peer Networks’ would be the most likely route to serving everyone; ‘Robot Revolution’ the least likely. The emergence of education technology giants, either globally or within-region, is not only a plausible scenario but also the one with the most uncertain outcomes. The provision of high-quality cognitive learning, in select subjects, targeted at different learner types and sold to parents on a strictly commercial footing, could put an end to education as a level playing field (HolonIQ, 2018).

Second, a decisive shift toward ecosystems could potentially weaken policymakers’ ability to guide the provision of education, precisely as they are seeking to refashion the learning system while balancing the equity principle and the use of technology.

These two considerations, in addition to others, suggest that in shaping the future of education, especially in support of human flourishing, policymakers should establish deeper partnerships with multiple stakeholders, orchestrating in particular a bolder and more inclusive approach to involving technology companies.

Conclusion

In reflecting on what education for human flourishing might mean for people in the middle years of the 21st century, this paper takes inspiration from both the ancient world and the future world. What the Greeks saw as the constituent parts of human flourishing are tested against developments in artificial intelligence that are already significant and may be transformational. Also, when the lens is widened, from individual to societal flourishing, we see that the Greeks' interest in rational thinking, ethical deliberation and awe in the face of the sublime, provides a promising way forward for tomorrow's human beings, by offering directions that only humans can take in an era of machine intelligence.

The paper builds on a series of OECD publications on how people might learn (the 2017 *Innovative Learning Environments*); what they might learn (especially the *OECD Learning Framework 2030*; and challenges for education systems (*Building the Future of Education*, 2021). These publications reflect a desire among OECD countries to strengthen and renew the value of education to countries, economies, and individual lives.

Synthesising a strand of thinking in the first phase of the High Performing Systems for Tomorrow initiative, the paper offers a foundation for the second phase, which involves a broader set of jurisdictions. There will be opportunities to validate and strengthen the thinking, but also to enrich it with new ideas and approaches, through research, dialogue and consultation.

Endnotes

1. Wikipedia: ‘Otto Scharmer, with colleagues at MIT, conducted 150 interviews with entrepreneurs and innovators in science, business and society, and then extended the basic principles into a theory of learning and management, which he calls Theory U. The principles of Theory U are suggested to help political leaders, civil servants and managers break through past unproductive patterns of behaviour that prevent them from empathising with their clients’ perspectives and often lock them into ineffective patterns of decision making.’
2. ‘The chief organiser of the Toronto conference, Associate Professor of Psychology at The University of Waterloo, Dr Igor Grossmann, convened the Task Force with the goal of establishing a common language and framework for researchers going forward.’ wisdomcenter.uchicago.edu/news/wisdom-news/toronto-wisdom-task-force-publishes-common-model-wisdom-guide-future-research and see Grossman, 2020.
3. The HolonIQ website, holonIQ.com, says it is ‘the world’s leading impact intelligence platform’ and that it ‘supports governments, institutions, firms and investors, with data insights to power decisions that matter.’

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Michael Stevenson leads innovation around the world on education purposes, policy and delivery.

He is Senior Adviser Education and Skills at the OECD, where he established and leads the High Performing Systems for Tomorrow initiative. Through policy dialogues at Permanent Secretary level, involving Australia, Canada, Estonia, Finland, Germany, Hong Kong, Singapore and the United Kingdom, the OECD is building a policy framework for countries interested in orienting their systems toward education for human flourishing.

As Vice President Global Education at Cisco Systems, 2007-2013, he co-founded the Global Education Leaders Partnership. Returning to GELP in 2020, as co-chair with Valerie Hannon, he has focused it on the design and implementation of local learning ecosystems.

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About the paper

Drawing on themes encapsulated in a series of OECD papers, the author explores new thinking on the purposes of education. After an opening reflection on societal goals and the priorities for education systems, he presents the concept of Education for Human Flourishing. He then discusses underpinning orientations; three competencies that people might need; the opportunities for assessment; and potential directions for how people should learn. In the final section he suggests trajectories for education system design and concludes that there will be opportunities to validate and strengthen this thinking, but also to enrich it with new ideas and approaches, through research, dialogue and consultation.