Organisation for Economic Co-operation and Development

EDU/PISA/GB(2024)10

Unclassified **English text only**

26 March 2024

DIRECTORATE FOR EDUCATION AND SKILLS
PROGRAMME FOR INTERNATIONAL STUDENT ASSESSMENT

Governing Board

PISA HIGH PERFORMING SYSTEMS FOR TOMORROW: EDUCATION FOR HUMAN FLOURISHING

57th meeting of the PISA Governing Board

17-19 April 2024
Valletta, Malta

The PGB is invited to **NOTE** the report.

Andreas Schleicher, Director for Education and Skills and Special Advisor on Education Policy to OECD's Secretary-General (andreas.schleicher@oecd.org)

JT03540306

Table of contents

PISA High Performing Systems for Tomorrow: Education for Human Flourishing

1. Introduction

1. *High Performing Systems for Tomorrow* (HPST) was established in 2018 for jurisdictions that achieve outstanding results in PISA and share a commitment to exploring the next frontiers in education, for their countries and the world.

2. In its first phase, 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.

3. In its second phase, beginning in February 2022, an expanded set of jurisdictions are considering Education for human flourishing in greater detail, again through the process of policy dialogue. They are seeking to create a single, coherent narrative that can inform policy development in secondary education and steer the long-term direction of PISA.

4. This document represents an evolving synthesis, prepared by the OECD, to support the jurisdictions. Its origins lie in a baseline paper published in 2022 (Education for Human Flourishing, Centre for Strategic Education) (2022[1]). The current iteration aims to strengthen and deepen the foundational arguments. Why and how should education purposes change? What exactly do we mean by Education for Human Flourishing? And what is its relationship to the evolution of artificial intelligence?

5. Education for human flourishing takes inspiration from the OECD Education 2030 Learning Compass. The compass helps young people navigate a volatile and ambiguous world in pursuit of well-being. It comes with tools and methodologies, including a voice for each learner in designing their own learning and overarching, transformational competencies that can be taught, measured and assessed. Education for Human Flourishing builds on this inheritance in four ways. First, it proposes a set of principles for addressing the weaknesses of the current education paradigm. Second it foregrounds the challenge and opportunity of AI and related technologies. Third, it develops some key concepts: in particular, flourishing is distinguished from well-being; agency is specified as discovering one's purpose in life through a series of innovative learning experiences; and adaptive problem solving, ethical decision making and aesthetic perception are presented as specific competencies that enable people to flourish and discover their purpose. Fourth, it provides important perspectives on metrics and system design.

2. Education Purposes

6. The origins of education lie in the ancient world. In many of the major cultures, 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.

7. Modern education systems, since their emergence in the 18th Century, have continued to value the fulfilment, authenticity and autonomy of the individual. 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.

8. As the industrial era developed, a central responsibility of education systems became 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 (Goldin and Katz, 2010[2]).

9. This is the Human Capital Theory on the aims of education, pursued by policymakers around the world since the 1970s. They have used 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.

10. Progress has been mixed. The supply of educated people has continued to lag behind advancing technologies, as flatlining results in science between PISA 2006 and 2015 starkly demonstrate. Most countries have struggled to close the equity gap. More broadly, the Human Capital theory has itself been progressively undermined. The HPST group has reflected on three particular critiques.

11. First, that the drive for economic growth, on which the Human Capital theory is premised, has been secured at too high a price. In many countries, we see widening wealth gaps, disruptive migrations and increasing social fragmentation. Despite international efforts to check fossil fuel emissions, current trends in global warming suggest that parts of the world will soon become uninhabitable or at least hostile to life. Consumption far exceeds the capacity of the earth's remaining natural resources to sustain it. And the continuing destruction of living species has caused a collapse in biodiversity. The economic model for which education systems have been providing human capital has caused damage to societies and the planet itself.

12. The second critique concerns the role of education in differentiating between people. The supply of human capital has been regulated by academic examination and progression. Schools have long served as a gateway to tertiary education by sifting students through testing. Recently, in many countries, college degrees have in turn become a signaling system, enabling employers to sort and remunerate applicants according to the prestige of the institution from which they graduate. In this way, Sandel argues, 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 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 don't succeed in education form the electoral base of populist politicians (2020[3]). Wooldridge defends meritocracy. It is right, he argues, that people get ahead 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 because the main measure of merit itself, ability in cognitive skills, is excessively narrow (2021[4]).

13. The third critique is that education is failing to address a new and urgent problem. In surveys, many people say their lives lack meaning. Less secure in allegiances to place, community, gender and faith, and less confident in the prospects for long-term employment and prosperity, they lack a sense of what their lives are for – the foundation of well-being and mental health. Lene Rachel Anderson (Andersen Rachel, 2019[5]) suggests that competing and unreconciled belief systems are a major reason for weakened human moorings. The indigenous view emphasises tribe, myth, order and the integration of human beings into the natural world. The pre-modern view subordinates the individual to religious and community norms. The modern view balances the needs of individuals and society: within a framework built on science, democracy and nation states, it provides the institutions that continue to shape our world. And the post-modern view exposes the arbitrariness and hidden structures of those institutions – but offers no replacements. She concludes that shared ways of seeing and interpreting the world have been fatally corroded. This is not to say that the root cause of corroded beliefs and loss of meaning is the Human Theory of Capital, rather that corroded beliefs and loss of meaning ask new and important questions of education. How can education provide an epistemology for the 21st Century, around which people of all beliefs and no beliefs can rally?

14. For the first time in many years, the purposes of education are being widely discussed. The HPST group suggests three principles around which future purposes should be built.

- Education should offer new ways of seeing, sensing and interpreting the world, in ways that reconcile competing beliefs and values, rebuild meaning in people's lives and restore well-being.
- Education should provide opportunity and fulfilment for everyone, respecting and nurturing a broader range of strengths, including dispositions for caring and creativity.
- Education should equip people to design and establish the next set of economic, societal and organisational models. Many countries are already adjusting their economic perspective, recognising, as Kate Raworth puts it, that the space for economic activity lies between a social foundation beneath which no one should fall and an ecological ceiling above which the Earth will be further degraded (2017[6]). Productive work will continue to be the engine of our societies and economies, but in support of broader goals.

15. Educators often say that with the pace of change so rapid, and the understanding of what lies ahead so limited, the best they can do is help students develop a reliable compass and tools to navigate uncertainty. But in the face of such profound challenges, are a compass and tools to navigate really enough? In recasting education purposes, the HPST group is looking to link education to human flourishing, rebalancing it in the service of a broader idea: to nurture, in all of us, a balanced suite of distinctive human capacities, that equip us not only to flourish as individuals but contribute to flourishing societies and economies, in harmony with the planet.

3. Education for Human Flourishing

16. How should flourishing be conceptualised? What would education that enables people to flourish look like? And would it pass the tests that we have set it?

3.1. An Aristotelian perspective

17. The High Performing Systems for Tomorrow project has adopted an Aristotelian perspective on human flourishing, drawing on the work of Kristján Kristjánsson (2019[7]). Kristjánsson has recently contributed further thinking to the project, locating Aristotle in a range of western and non-western traditions (Hinton, Hill and Yemiscigil, 2023[8]).

18. Reflecting a recent analysis by De Ruyter et al (2022[9]), Kristjánsson shows that in the European tradition flourishing is assessed mainly according to objective criteria relating to facts about a person's life; is intrinsically worthwhile; optimises human potential over life as a whole through ongoing activities that pursue objective goods; and is possible only when a set of preconditions, such as family, health, safety and material comfort, are in place. The major flourishing accounts are Aristotelianism, liberalism, positive psychology, and self-determinism theory.

- Aristotle, the Greek philosopher, saw flourishing as the intrinsically desirable, ultimate end of human beings. Flourishing is what human beings do when they achieve their full potential. It involves virtuous activity, suitable and peculiar to human beings, achieved over a whole life.
- The positive psychology account developed by Seligman foregrounds five dimensions of the flourishing life: positive emotion, engagement, meaning, relationships and accomplishments (PERMA). Seligman argues that all five dimensions are underpinned by character and virtue (2012[10]).
- The liberal account, originating in the political philosophy of Locke, presents the flourishing life as one in which the individual develops their autonomously chosen capabilities, emphasising the role of the state in creating the enabling background conditions.
- Self-determination highlights three needs that humans must satisfy in order to flourish: autonomy, relatedness and believing oneself to be competent.

19. For the High Performing Systems for Tomorrow project, there are two justifications for building on Aristotle. First, Aristotle places special emphasis on what people should learn in order to flourish, in a way that opens up all the central issues for education, including not only curriculum but pedagogy and assessment; whereas the liberal and self-determination accounts avoid – and are defined by this avoidance – a directive approach to what people should learn. Second, Aristotle's thinking in the mid-4th Century BCE corresponds in interesting ways to Seligman, the contemporary psychologist. The correspondence lies not only in their reliance on character but in the dimensions of flourishing in which they are interested.

Aristotle (Nicomachean Ethics)	Seligman (Flourishing, 2015)
Pleasure	Positive emotion
Activity	Engagement
Friendship	Relationships
Contemplation/use of the mind	Meaning/Purpose
Prosperity and success	Accomplishments

Source: Chart adapted from Humanity 2.0, Project Vision White Paper, (Sullivan, 2019[11])

20. Kristjánsson's account of Education for human flourishing is Neo Aristotelian, in the sense that it also takes account of modern social science. He says it should consist of three components: moral, reason-infused, emotionally driven, activities that are meaningful to the individual and have some consequence in the world; contemplation; and awe-struck enchantment (2019[7]). He explains that only the first and second components come from Aristotle. The third borrows on 19th Century Romanticism, as well as Humanistic and Positive Psychology. What Aristotle meant by contemplation is the intellectual capacity to derive principles from observation of the physical world (wondering about the world). This leaves space for awe (wondering at the world, from sublime sunsets to crystals seen through a microscope).

21. What kind of education proposition is this? It is a description of activities people should learn to undertake in order to be and to act in distinctively human ways. At its centre stands a double objective: the development of human cognition, exercised according to moral principles and informed by scientific reasoning; and the development of human meaning, both through one's personal contribution in the world and one's sense of something bigger and more mysterious.

22. But if it is to be compelling in the 21st Century, it should address two other profound concerns: well- being and what we owe to others.

3.2. Well-being

23. Aristotle was primarily interested in the objective features of flourishing. Modern writers such as Seligman focus on its subjective features too. The growing realisation that large numbers of students are unhappy, and that the pandemic made things worse, places student well-being at the heart of research and policy-making in education.

24. Student well-being has been defined as a dynamic state characterised by psychological, social, physical, cognitive and material factors that enable students to live well (Borgonovi and Pál, 2016[12]). Building on this definition, the Harvard Human Flourishing Program has contributed to High Performing Systems for Tomorrow a study of how education practices, in areas including relationships, character skills, health and meaning, contribute to student well-being (Hinton, Hill and Yemiscigil, 2023[13]).

25. There is an important difference between the Neo-Aristotelian account of education that supports human flourishing and accounts of education that support student well-being. What is central to Neo Aristotelianism is education that enables objective flourishing over the lifetime. What is central to student well-being accounts is the subjective happiness of individuals currently in education. The first relates more to positive education outcomes. The second relates more to positive education experiences.

26. Nevertheless, reconciling education for human flourishing and education for student well-being is vital to developing new and expanded aims of education. There is every reason to place an Education for human flourishing programme in a carefully designed learning environment, where the learning principles, pedagogies and practices support both objective flourishing and subjective well-being.

3.3. What we owe to others

27. The emphasis on individual flourishing should not suggest that the flourishing of others does not matter. Looking at three non-European approaches to flourishing, Kristjánsson underlines the central importance of caring for and about others.

- In Ubuntu, he notes, selfhood is realised through others. It is only by caring for others' needs that one cares for one's own. Education is the process of "learning to participate in socio-moral projects that have communal value".
- Confucians pursue harmonious relationships through a process of continuous transformation. The goal of education, emphasising empathy and compassion, is to integrate the capabilities of both the individual and the group in service of the community.
- Buddhists reject the concept of individual selfhood. The goal of education is to overcome egoistic craving, anger and intellectual illusions; and become compassionate toward all living beings and the natural environment.

28. Kristjánsson concludes that all three approaches are inherently relational and other-entwined. Education for human flourishing concerns one's own flourishing and the flourishing of others.

29. The crisis of the planet extends these obligations. First, it insists on our responsibilities to other living species. Second, it prompts us to consider the interests of future lives. MacAskill argues that the number of past and present lives will be far exceeded by the number of future lives that could be lived before the natural extinction of the earth. History shows us that we can shape future lives, for good or ill. Education should develop the values and capabilities in today's generation to ensure that the interests of future generations are given full weight (MacAskill, 2022[14]).

3.4. Summary

30. Conceived in this way, Education for human flourishing embodies the three principles on which future education systems should be built. It encourages a broader range of capabilities, spanning the academic, the caring and the creative. It nurtures the designers of fair and sustainable models for the future. And it restores meaning to people's lives.

31. In a later section of this paper, we will develop an Education for human flourishing orientation. We will explore ways in which people could find their purpose through three successive processes of learning: sensing and making sense of the world around them, reflecting on their own deepest motivations and capacities; and prototyping solutions to problems bearing on humanity's future.

32. From there we will go on to present and analyse three Education for human flourishing competencies, designed to equip people both to find their purpose and to fulfil it over the course of their lives. These are adaptive problem-solving, ethical decision making and aesthetic perception.

33. 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.

34. 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.

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

36. All three competencies combine specific knowledge, skills, attitudes and values. They build on prior disciplinary and interdisciplinary learning, in the sciences, social sciences and humanities; and prior development of social and emotional skills including resilience, empathy and collaboration.

37. They are neither strictly substitutive, in the sense that students learn them instead of other things, nor additional, in the sense of making significant new demands on time and teaching in an already-crowded curriculum. Rather, they are emergent properties of the curriculum as a whole. As students learn and mature, there is an opportunity to help them interpret and shape what they have learned so far, to ensure the competencies become embedded.

38. Adaptive problem-solving, ethical decision making and aesthetic perception are also malleable. We will explore a range of guided, active and experiential pedagogies designed to foster them. Finally, they are measurable and assessable. In all three cases we will put forward effective approaches: closer to traditional practices in the case of aesthetic perception, more novel in the case of ethical decision making and aesthetic perception.

39. But before we move to the orientation and competencies, we pause to consider what may be an inflection point in human experience. The search for education purposes to support human flourishing coincides with the rapid development of artificial intelligence. Will AI inhibit or facilitate human flourishing? In particular, how might AI impact on attempts to broaden human capabilities, develop a generation of young people capable of designing new solutions and restore meaning to individual lives?

4. Education for Human Flourishing and Artificial Intelligence

40. 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[15])*

41. 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, 2021[16])

42. As a contribution to High Performing Systems for Tomorrow, the Australian Department of Education has synthesised cross-government perspectives on the evolution of AI, presenting a careful assessment of its significance for individuals, societies and economies. A striking feature of this work is how AI offers both opportunities and threats, differently balanced in each sphere.

- In the individual domain, AI systems could relieve us of humdrum tasks that demand our time and attention, from shopping to diary management. But at the same time, the automation of our personal lives could further undermine self-worth, identity and meaning.
- At the societal level, deep analysis of large data could accelerate increased social mobility and reduced inequality. But we already see how AI is fueling the misuse of power in improper sale of data; the growth of hidden surveillance; interference in democratic processes; fraud, theft and extortion; and the creation and distribution of false and misleading information.
- The economic calculus is finely balanced. AI offers opportunities to enhance productivity and innovation. But workers in many sectors and at all levels may see the rapid automation of their skills, leading at best to a period of painful disruption. ChatGPT, an instant revolution in aggregating and communicating knowledge, vividly demonstrates how quickly this might happen.

43. How do these threats and opportunities relate to the principles for future education?

4.1. AI and broadening human capabilities.

44. It is often said that AI will drive us to extend and diversify our human capabilities, in areas that AI will not reach. But those areas are likely to be few and far between. AI has already made inroads into human cognitive processes, not least in achieving perfect scores in PISA assessments. The AI Research Roadmap, guiding researchers and policymakers in the United States, suggests that by 2040 AI will be effective in critical thinking, creative thinking, ethical reasoning, flexibility and collaboration. The OECD's Artificial Intelligence and Skills project predicts that AI will in due course be capable of all tasks,

barring only those involving visual input, complex motor movement and the resolution of unstructured problems.

45. But the progress of AI should not condemn us to a long withdrawal. Humans bring a holistic approach. We are at our best not when we segment what we do into discrete, potentially automatable tasks, but when we look across an activity as a whole, deploying an integrated suite of cognitive, metacognitive and socio-cognitive skills in its design, evaluation, communication and execution. What AI does imply is that important human capabilities should not be left under-developed. If the current education paradigm gives greater weight to the cognitive and insufficient weight to the socio-cognitive and the meta-cognitive, the new education paradigm should redress the balance. It is for this reason that the HPST group sees socio-cognitive and meta-cognitive capabilities becoming central pillars of education over coming years.

4.2. AI and developing new models for the future.

46. AI further weakens our existing societal, economic and organisational models. Economic crime, surveillance capitalism and democratic interference all undermine the models we have today, making them less fair and less sustainable.

47. AI therefore adds urgency to the search for new models. But it can potentially facilitate their development. Policy makers, scientists, researchers and designers will harness AI not only to build solutions but also ensure that specific groups are not disadvantaged and that environmental effects are positive.

4.3. AI and restoring meaning to individual lives.

48. Will AI encroach on what it is to be a person, further damaging our sense of purpose, identity and meaning? The issue is sharpest in relation to work and to autonomy.

49. The impact of AI on work and livelihood is contested. Russell argues that it will inevitably replace humans over time. In the short to medium term, employment may remain stable, as AI addresses new areas of need and demand. But eventually, most existing tasks will be automated; and, in nearly all areas, demand will be satisfied with very few humans required. He recalls Keynes's prediction.

> *For the first time since his creation, man will be faced with his real, his permanent problem – how to use his freedom from pressing economic cares, how to occupy the leisure which science will have won for him, to live wisely, agreeably and well (Keynes, 1930[17])*

50. On the other hand, as suggested above, we should resist the assumption that as AI becomes more competent, humans will be forced to abandon areas of work, ceding successive sectors and professions to machines. It may also be that the work we do in future becomes more meaningful, if we succeed in developing societies, economies and organisations that are fairer and more sustainable.

51. The risk that AI will curtail our autonomy is more clearcut. In the political sphere, algorithms are already used to target specific categories of voter with specific messages. Harari 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 (2015[18]).

52. At the very least, therefore, the growing influence of AI, in these and other areas, suggests that humans should both seek to limit its impact on activities that provide meaning and develop new sources of meaning by nurturing broader capabilities and finding deeper purposes.

4.4. The next horizon?

53. Narrow AI, the capacity of machines to solve the problems humans set them in defined fields of activity, is widely seen as the gateway to General Purpose AI, the capacity to learn, generalise and apply knowledge across multiple fields of activity. General Purpose AI is another country.

54. Bostrom argues that General Purpose AI sits alongside whole brain emulation, brain/computer interfaces and cognitive enhancement as a possible – and the most likely – route to superintelligence. He presents superintelligence as both a defence against existential risk, natural and man-made, and a creator of existential risk, in the form of a totalitarian future.

> *A single AI agent designs better and better versions of itself, quickly developing abilities far greater than the abilities of all humanity combined. Almost certainly, its aims would not be the same as humanity's aims. And in order to better achieve its aims, it would try to gain resources and try to prevent threats to its survival. It would therefore be incentivised to take over the world and eliminate human beings or permanently suppress them (2014[19]).*

55. Bostrom sees the essential task of our age as steering the development of AI, by slowing it to advance other technologies first and focusing it on problems that contribute positively across multiple scenarios and are acceptable from a range of viewpoints. He sees this as "a morally exploratory world".

56. The likelihood of General Purpose AI and superintelligence, whether achieved in a few decades or longer, poses challenges to humanity of a different order. Education for human flourishing, in broadening and rebalancing human capabilities, restoring meaning to human lives and creating fair and sustainable models for the future, may be our best shot at controlling it – and so securing, in Bostrom's words, "the attainment of a civilisational trajectory that leads to the compassionate and jubilant use of humanity's cosmic endowment".

5. Education for Human Flourishing – Orientation

57. The OECD 2030 learning framework, published in 2018 ([20]), sets well-being 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 judgments 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.

58. Human flourishing is a more aspirational term than well-being. 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?

59. Leadbeater sees co-agency in education in terms of 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, 2022[21]).*

60. Here, agency is individual, collaborative and collective. And though 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.

61. 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*.

62. Theory U 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 we ourselves; and that the most important change occurs in underlying paradigms of thought. Listening is a fundamental tool: especially empathetic 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[22]).

63. 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 accesses deeper sources of personal creativity in order to co-sense and co-direct the emerging shape of the future. Leaders are invited to actualise their highest possible 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.

64. 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.

6. Education for Human Flourishing - Competencies and Assessment

65. 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[23])*

66. 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.

67. 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 a 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 kind of tasks elicit or probe them?
- What task specifications guide assessment assembly and administration?

68. The High Performing Systems for Tomorrow project has identified three potential competencies, each with a suggested approach to assessment, that might underpin education for human flourishing. They are adaptive problem-solving, ethical decision making and aesthetic perception. 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.

6.1. Adaptive problem-solving

69. 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.

70. 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.

71. The PISA assessment strategy would explore the extent to which students, drawing on ICT skills, can mobilise multiple competences 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.

6.2. Ethical decision making

72. 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.

73. The Wisdom Task Force, 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.

74. 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.

75. 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.

6.3. Aesthetic perception

76. 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.

77. 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. 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. (2011[24])

78. 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, there are 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: 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: 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?

79. 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 comparing their responses to hypothetical answers. The assessment might consider not only verbal but also emotional and physiological responses.

80. 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.

81. 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?

7. Education for Human Flourishing - How People Should Learn

82. 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[25]).

- It recognises the 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 programmes 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.

83. 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.

84. 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, contends that active learning is better suited than guided or experiential learning to supporting human development (2020[26]). 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 therefore be structured around 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

85. 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.

86. 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).

87. 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, but experiential learning may be equally important, especially in giving opportunities to students to engage creatively, emotionally, socially, and physically.

8. Education for human flourishing – Trajectories for System Design

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

89. 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 Centre on Education and the Economy (2020[27]).

90. 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.

91. 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? And what would it take to reconcile them within a single strategy?

8.1. Equity

92. 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. 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 (2021[28]).

93. 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.

94. 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 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).

95. 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 purpose through learning, combining aspirations and distinctively human competencies in order to make a different, personal contribution to future transformation.

8.2. AI-based education technologies

96. 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.

97. 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.

98. 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.

99. Luckin argues 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 (2020[29]).

100. Shute is more cautious but believes 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….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" (2021[30]).*

8.3. Eco-systemic approaches to education

101. 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.

102. In Back to the Future of Education: 4 OECD scenarios for schooling (2020[31]), 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."*

103. 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.

104. 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, that 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 well-being; and renewed trust and civic engagement (Global Education Futures, 2020[32]).

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

106. For example, AI-based education technologies could either strengthen equity and opportunity or undermine them. Holon IQ 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 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[33]).

107. 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.

108. 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.

9. Conclusion

109. 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 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. And 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 still provide a promising way forward for the human race.

References

Andersen Rachel, L. (2019), *Metamodernity*, Nordic Bildung. [5]

Borgonovi, F. and J. Pál (2016), "A Framework for the Analysis of Student Well-Being in the PISA 2015 Study: Being 15 In 2015", *OECD Education Working Papers*, No. 140, OECD Publishing, Paris, https://doi.org/10.1787/5jlpszwghvvb-en. [12]

Bostrom, N. (2014), *Superintelligence*, Oxford University Press. [19]

Dehaene, S. (2020), *How We Learn: The New Science of Education and the Brain*, Penguin Books Ltd. [26]

Fullan, M. (2021), *The Right Drivers for Whole System Success*, The Centre for Strategic Education, Victoria, Australia. [28]

Gardner, H. (2011), *Truth, Beauty, and Goodness Reframed: Educating for the Virtues in the é&st Century*, Basic Books. [24]

Global Education Futures (2020), , *Learning Ecosystems*, http://www.joshuacubista.com/uploads/7/8/9/8/7898654/learning_ecosystems_2020.pdf. [32]

Goldin, C. and L. Katz (2010), *The Race between Education and Technology*, Harvard University Press, https://doi.org/10.2307/j.ctvjf9x5x. [2]

Harari, Y. (2015), *Homo Deus*, Harvill Secker. [18]

Hinton, C., B. Hill and A. Yemiscigil (2023), *Evidence-based Interventions and Initiatives to Support Student Well-being in Schools*, OECD. [13]

Hinton, C., B. Hill and A. Yemiscigil (2023), *The New Flourishing Agenda*, OECD. [8]

HolonIQ (2018), , *Education in 2030: Five scenarios for the future of learning and talent*, https://comms.holoniq.com/hubfs/Education/Asset%20downloads/HolonIQ%20Education%20in%202030.pdf. [33]

Keynes, J. (1930), *Economic Possibilities for our Grandchildren (1930)*, https://www.hetwebsite.net/het/texts/keynes/keynes1930grandchildren.htm. [17]

Kristjansson, K. (2019), *Flourishing as the aim of education*, Routledge. [7]

Leadbeater, C. (2022), *Learning on purpose*, Centre for Strategic Education, Victoria, Australia, https://static1.squarespace.com/static/6098eb1bb86d9454e6f1a0e6/t/62569081136c17791592e7e0/1649840258658/CSE%2BLeading%2BEducation%2BSeries%236-1%2B%281%29.pdf. [21]

Luckin, R. (2020), "AI in education will help us understand how we think", *Financial Times*, https://www.ft.com/content/4f24adca-5186-11ea-8841-482eed0038b1. [29]

MacAskill, W. (2022), *What We Owe The Future*, Oneworld Publications. [14]

NCEE (2020), *Blueprint for a High-Performing Education System*. [27]

OECD (2021), *Building the Future of Education*, https://www.szbxnet.com/pdf/future-of-education-brochure.pdf. [34]

OECD (2020), *Back to the Future of Education: Four OECD Scenarios for Schooling*, Educational Research and Innovation, OECD Publishing, Paris, https://doi.org/10.1787/178ef527-en. [31]

OECD (2019), *Artificial Intelligence in Society*, OECD Publishing, Paris, https://doi.org/10.1787/eedfee77-en. [15]

OECD (2018), *OECD Learning Framework 2030*, https://www.oecd.org/education/2030/E2030%20Position%20Paper%20(05.04.2018).pdf. [20]

OECD (2017), *The OECD Handbook for Innovative Learning Environments*, Educational Research and Innovation, OECD Publishing, Paris, https://doi.org/10.1787/9789264277274-en. [25]

OECD (2005), *THE DEFINITION AND SELECTION OF KEY COMPETENCIES*, OECD Publishing, https://www.oecd.org/pisa/definition-selection-key-competencies-summary.pdf. [23]

Raworth, K. (2017), *Doughnut Economics*, Random House Business. [6]

Russell, S. (2021), *Living with Artificial Intelligence*. [16]

Ruyter, D. et al. (2022), "Education for flourishing and flourishing in education", in *Reimagining Education: The International Science and Evidence based Education Assessment*, UNESCO MGIEP, https://doi.org/10.56383/xbxz7711. [9]

Sandel, M. (2020), *The Tyranny of Merit*, Farrar, Straus and Giroux. [3]

Scharmer, O. (2016), *Theory U: Leading from the Future as It Emerges*, Berrett-Koehler Publishers. [22]

Seligman, M. (2012), *Flourish: A Visionary New Understanding of Happiness and Well-being*, Atria. [10]

Shute, V. et al. (2021), "Machine learning", in *International Encyclopedia of Education(Fourth Edition)*, Elsevier, https://doi.org/10.1016/b978-0-12-818630-5.14013-8. [30]

Stevenson, M. (2022), *Educaiton for Human Flourishing*, Centre for Strategic Education, https://www.cse.edu.au/publications/leading-education-bundles/. [1]

Stevenson, M. (2019), *An OECD Learning Framework 2030 (in Bast, Caryannis, Campbell (Eds) The Future of Education and Labour)*, Springer. [35]

Sullivan, E. (2019), *Humanity 2.0, Project Vision White Paper*, ANGELICUM. [11]

Wooldridge, A. (2021), *The Aristocracy of Talent*, Allen Lane. [4]