

Yidan Prize
— 丹 獎

WORLDWIDE EDUCATING FOR THE FUTURE INDEX 2018

Building tomorrow's global citizens



Produced and written by

The
Economist

INTELLIGENCE
UNIT

Contents

| | |
|---------------------------------------------------------------------------------------------------|----|
| About the research | 1 |
| Executive summary | 3 |
| Introduction. Widening the aperture: The Worldwide Educating For the Future Index, year two | 5 |
| Box I. Wealth and complacency: Comparing index scores and GDP per head | 7 |
| Box II. Spotlight on Shanghai: China's education champion | 9 |
| Chapter 1. Thinking outside the policy box | 10 |
| Box III. Putting the work into study: Aligning education to the jobs of tomorrow | 13 |
| Chapter 2. Continuous learning in the face of change | 15 |
| Box IV. I, robot teacher: The role of AI in teaching for tomorrow | 17 |
| Box V. Toppling the Tower of Babel: The importance of language learning in future education | 18 |
| Chapter 3. Better students, better citizens | 21 |
| Box VI. Calls to action: Educating for civic initiative | 22 |
| Conclusion. A passport to global citizenship | 24 |
| Appendix. Index methodology | 25 |

About the research

This report is based on the findings of the Worldwide Educating For the Future Index, which was first created by The Economist Intelligence Unit in 2017 and has been fully updated. The report and index have been commissioned by the Yidan Prize Foundation. The analysis is also based on in-depth interviews conducted with 17 global experts on education. The index was developed to assess the effectiveness of education systems in preparing students for the demands of work and life in a rapidly changing landscape. It focuses on the 15-24 age band in 50 economies around the world.

Our thanks are due to the following individuals for their time and insights:

- Rajika Bhandari, senior adviser, research and strategy, Institute of International Education
- Jennifer Blanke, vice-president, agriculture, human and social development, African Development Bank
- Sarah Brown, president, Their World, and executive chair, Global Business Coalition for Education
- Jaime Casap, chief education evangelist, Google

- Steven Cohen, professor, School of International and Public Affairs, Columbia University
- Vicky Colbert, founder and director, Fundación Escuela Nueva
- Dorothy Gordon, consultant (former director-general, Ghana-India Kofi Annan Centre of Excellence in ICT)
- Allan Goodman, president and CEO, Institute of International Education
- Kei Kawashima-Ginsberg, director, Center for Information and Research on Civic Learning and Engagement, Tufts University
- Jim Knight, chief education adviser, TES Global
- Simon Marginson, professor of higher education, department of education, Linacre College, University of Oxford
- Ong Ye Kung, minister for education, Government of Singapore
- Brajesh Panth, chief, education sector group, Asian Development Bank
- Frank Reichert, research assistant professor, faculty of education, University of Hong Kong

- Jaime Saavedra, senior director, education, World Bank
- Wang Yi, founder and CEO, Liulishuo
- Christine Min Wotipka, associate professor (teaching) of education and (by courtesy) of sociology, Stanford University

The index development was also informed by input from an advisory panel of four experts, who provided feedback on indicator selection and other factors. We would like to thank the following people for their time and contribution:

- Paul Comyn, senior skills and employability specialist, International Labour Organization
- Simon Marginson (see before for affiliation)
- Robert Tijssen, chair, science and innovation studies, Leiden University
- Christine Min Wotipka (see before for affiliation)

The report was written by Denis McCauley and edited by Michael Gold. Trisha Suresh and Michael Frank designed the index and oversaw the data compilation, with research support from Shreya Mukarji.



Executive summary

As educators seek to identify the right skills and teaching approaches to ready students for tomorrow's challenges, the ground is shifting beneath their feet. Projections of future job markets and work environments vary widely. New technologies give rise to both optimism and trepidation about their impact on the workforce. Climate change appears to be accelerating. Political headwinds against globalisation and all it entails are gaining strength. And in many parts of the world, once firmly held assumptions about the virtues of democracy, civil freedoms and respect for diversity are being questioned.

In this context, the urgency is clear about the need to adapt education systems to deliver problem-solving, collaboration, creative and other skills that will help tomorrow's adults address such challenges. No less urgent is ensuring that newly adapted curriculum and teaching methodologies reinforce the virtues of civic awareness and participation—in local, national and global initiatives—that can counter nativism and intolerance. The index was created to assess the readiness of education systems around the world to deliver such future-oriented skills. In this, its second year, the index has been expanded in both geographic and thematic scope.

Among the 50 economies the index now covers, Finland emerges in 2018 as the leader in providing future-

skills education, followed closely by Switzerland. Both systems are strong in all three index categories, but they particularly excel in their policy environment—in, for example, the formulation of future-skills strategy and attention to curriculum and assessment frameworks. These and other small, wealthy economies in Europe and Asia dominate the upper tier of the index.

Other findings of the research include the following:

- **Wealth is not all-important when it comes to future skills.** There are some index overachievers among lower-income economies. Ghana, for example, punches well above its weight when measured against GDP per head, performing strongly in future-skills strategy and assessment. Mexico, Colombia and the Philippines merit favourable mentions for their work in policy areas, as does Costa Rica for its efforts to adapt teaching to the demands of tomorrow. There are also underachievers when comparing index scores with income levels—including Norway, the US, Israel and Spain.
- **Reviews are essential amid constant change.** Future-skills strategy, curriculum and assessment frameworks should be reviewed periodically to keep pace with workforce and societal change. Most

education systems in the index have reviewed their future-skills strategy in the past year, but fewer than half have done the same for curriculum and the assessment frameworks. Some high-income economies haven't reviewed these in the past three years.

- **Teachers must also engage in continuous learning to stay ahead of the curve.** "Lifelong learning" is becoming an imperative in a variety of professions—teaching foremost among them. Teaching methods must be continuously updated, as future-skills requirements are fluid. Yet this challenge is not being met: only nine index economies currently require in-service training of upper secondary teachers that includes future-skills training. The use of emergent technologies such as artificial intelligence can hasten the shift toward different teaching methods by, for example, freeing teachers to spend more time guiding students' group-based projects rather than engaging in rote drills.
- **Diversity and tolerance should be instilled as universal values.** Every culture is different, but some values—notably diversity and tolerance—are universal and should be reflected in the classroom and extra-curricular activities of young people everywhere. They help foster a liberal worldview in general, which is reflected in index

indicators such as attitudes toward immigration, religious freedom, and lesbian, gay, bisexual and transgender (LGBT) individuals and rights.

- **Rigid approaches do not suit future-skills learning.** Policymakers around the world, and in East Asia in

particular, are realising that the rigid, exam-based approach to learning has been taking a toll on students, their families and wider society. Emphasis is shifting in some education systems toward other measures of attainment, and inculcating 21st-century skills is now part of that strategy. It remains

to be seen whether the continuing pursuit of national economic competitiveness—a major motivator behind the test-based achievement systems prevalent in much of the world—will conflict with this push toward different modes of learning.



Introduction. Widening the aperture: The Worldwide Educating For the Future Index, year two

In the inaugural edition of this index, we found that most national education systems are struggling to equip young people with future-oriented skills. There is recognition among many policymakers of the need to foster leadership, entrepreneurship, creativity, communication, global awareness and civic education skills among students, as well as digital skills. But acting on that recognition is proving an enormous challenge. For example, many governments explicitly target the aforementioned skills as priority areas in their national education strategies and set milestones for progress. Far fewer have yet taken steps to adapt curriculum accordingly or develop the appropriate assessment frameworks.

Gaining a more nuanced understanding of where economies are struggling in this effort is a major motivation behind the changes made to the index. Five new indicators and 11 new sub-indicators have been added across the same three broad domains of policy environment, teaching environment and socio-economic environment. Many existing ones have been revised, which allows for consideration of factors such as strategy and curriculum reviews, and the role of foreign-language learning, extra-curricular activities and international education. An important change is the expansion of indicators relating

to cultural diversity and tolerance, as well as to civic freedom. These are in recognition of the universality of certain societal values, and their importance to shaping the global citizens of tomorrow.

Capturing more people is the other key objective in this update. Fifteen economies have been added to the index, all but two in the middle- or low-income category. The index now covers 50 economies, representing 89% of the world's population and 93% of global GDP.

Top of the class

Finland emerges as the world leader in future skills education, followed closely by Switzerland. Both particularly excel in the policy environment category, and specifically in terms of formulation of future-skills strategy, the periodic review of strategy and the assessment frameworks to support future-skills training. Although the previous iteration's top two of New Zealand and Canada have fallen back a couple of places, both remain among the top performers in each category—and are within the top five in terms of their teaching environment and socio-economic environment for future-skills education. (The fact that their overall scores are lower in this iteration of the index is explained more by the

larger number of economies, rather than deterioration in actual performance.)

The top tier is predictably dominated by the education systems of rich-world economies, although a detailed look into the index categories reveals several examples of developing-world economies performing admirably—often better than developed ones—in specific areas. Examples can be found in Latin America, where Costa Rica earns comparatively high scores in aspects of its teaching environment (teacher training, school administration) and its socio-economic environment (notably in the diversity and tolerance sub-category). Mexico and Colombia outrank the likes of South Korea and the US in terms of the policy environment. Elsewhere, Kazakhstan, the Philippines and Ghana emerge favourably in comparison with several richer economies in their policy approaches to future-skills training and in the quality of teacher training (see box I).

It is also worth noting that the largest economies in the index by population are not among the leaders in any future-skills category. Of the ten largest, only the US and Mexico squeeze into the overall top 20. This is probably a reflection of the difficulties that governments face in implementing any type of change across sprawling education systems, some of which—as

Figure I. Back to the future

Worldwide Educating For the Future Index 2018 scores, overall and by category (out of 100)

Colour key High score Medium score Low score

| RANK | ECONOMY | OVERALL SCORE | POLICY ENVIRONMENT | TEACHING ENVIRONMENT | SOCIO-ECONOMIC ENVIRONMENT |
|------|--------------|---------------|--------------------|----------------------|----------------------------|
| 1 | Finland | 80.9 | 96.7 | 67.6 | 90.6 |
| 2 | Switzerland | 80.3 | 93.6 | 69.5 | 87.6 |
| 3 | New Zealand | 79.3 | 88.2 | 69.7 | 90.1 |
| 4 | Sweden | 78.1 | 89.5 | 66.5 | 89.8 |
| 5 | Canada | 77.9 | 76.5 | 74.5 | 88.3 |
| 6 | Netherlands | 76 | 71 | 75.4 | 85.1 |
| 7 | Germany | 74.8 | 77.4 | 69.7 | 83.8 |
| 7 | Singapore | 74.8 | 94 | 66.9 | 65.7 |
| 9 | France | 74.2 | 83.4 | 67.1 | 77.9 |
| 10 | UK | 74.1 | 72.6 | 70.7 | 84.8 |
| 11 | Australia | 74 | 78.3 | 68 | 82.7 |
| 12 | Japan | 68.4 | 70.3 | 68.9 | 64.4 |
| 13 | Chile | 65.3 | 76.9 | 56.5 | 69.8 |
| 14 | Norway | 65 | 57.8 | 58.9 | 91 |
| 15 | Hong Kong | 63.7 | 61.8 | 66 | 60.7 |
| 16 | South Korea | 63.2 | 59.8 | 67 | 58.5 |
| 17 | Taiwan* | 59.7 | 69.6 | 48.7 | 72.3 |
| 18 | US | 58.9 | 56.4 | 53.9 | 75.1 |
| 19 | Mexico | 58.8 | 70.1 | 55 | 51.1 |
| 20 | Colombia | 57.4 | 65.4 | 49.7 | 64.7 |
| 21 | Costa Rica | 57.3 | 48.7 | 55.2 | 75.7 |
| 22 | Italy | 56.6 | 59.9 | 53 | 60.9 |
| 23 | Israel | 55 | 49.4 | 53.8 | 66.4 |
| 23 | Spain | 55 | 46.4 | 54 | 70.2 |
| | AVERAGE | 54.1 | 58.2 | 49.6 | 59.4 |
| 25 | Ghana | 53.9 | 71.4 | 42.7 | 55.5 |
| 26 | Russia | 52.9 | 60.7 | 53.3 | 40 |
| 27 | Poland | 52.5 | 41.9 | 55.2 | 61.9 |
| 28 | Philippines | 52.2 | 73.6 | 37.5 | 57.2 |
| 29 | UAE | 51.5 | 70.2 | 37.4 | 58.6 |
| 30 | Malaysia | 51.3 | 47.8 | 52.3 | 54.1 |
| 31 | Brazil | 50.4 | 54.9 | 42.8 | 62.5 |
| 32 | Kazakhstan | 50.3 | 76.2 | 36.9 | 44.9 |
| 33 | South Africa | 50 | 47.1 | 47.4 | 60.7 |
| 34 | Peru | 48.7 | 56.9 | 40 | 58.1 |
| 35 | Argentina | 47.3 | 62.5 | 32.3 | 62.3 |
| 36 | Thailand | 45.1 | 43.2 | 45.8 | 46.3 |
| 37 | Vietnam | 44.2 | 51.6 | 42.7 | 36.8 |
| 38 | Turkey | 43.2 | 51.3 | 40.4 | 38 |
| 39 | China | 42.5 | 43.7 | 44.6 | 35.5 |
| 40 | India | 41.2 | 61.5 | 32.2 | 33.3 |
| 41 | Kenya | 39.6 | 42.8 | 36.7 | 42.1 |
| 42 | Saudi Arabia | 38 | 33.9 | 38.6 | 42.8 |
| 43 | Indonesia | 36.8 | 47.6 | 26.9 | 45.3 |
| 44 | Ethiopia | 32.6 | 29.9 | 33.4 | 34.7 |
| 45 | Bangladesh | 28.2 | 30.8 | 26.3 | 28.9 |
| 46 | Egypt | 28 | 19.5 | 31.8 | 31.3 |
| 47 | Nigeria | 27 | 27.5 | 21.7 | 39.5 |
| 48 | Algeria | 26.7 | 13.5 | 30.4 | 37.3 |
| 49 | Iran | 24.3 | 15.5 | 29.8 | 23.9 |
| 50 | Pakistan | 19.9 | 20.3 | 15.4 | 30.9 |

Source: The Economist Intelligence Unit

is the case in the US—are relatively decentralised. Within them, however, can be found pockets of progress; China, for example, earns a high score

for university-industry collaboration. It has also rolled out reform in some geographic pockets, like Shanghai, which has scored highly on the Programme for

International Student Assessment, a test of educational achievement administered by the OECD (see box II).

* The use of country and territory names in this report is based on the conventions used by The EIU and not an endorsement or otherwise by Yidan Prize Foundation.

Box I. Wealth and complacency: Comparing index scores and GDP per head

Logic might dictate that the wealthier and more developed a country is, the better positioned its education system will be to provide its young people with future-oriented skills. The index performance of some middle- and low-income economies, however—including Chile, Kazakhstan, Ghana and the Philippines—appears to challenge that assumption, as conversely does

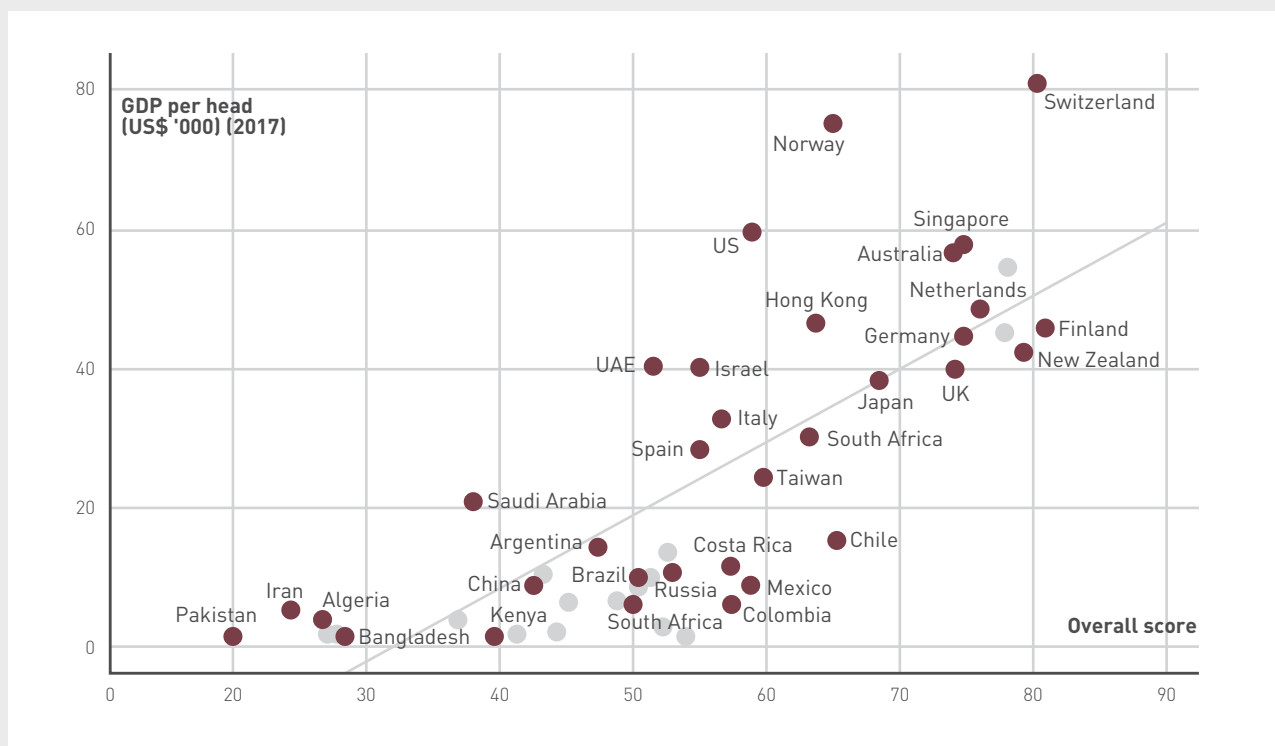
the performance of some high-income ones, including the US.

Wealthier economies, to be sure, generally perform better than poorer ones in adapting to future-skills needs. Part of this may be because debates about future skills are a luxury in many parts of the developing world, according to Jennifer Blanke

of the African Development Bank. African nations, she notes, have made massive strides in the past several years in getting children into primary education, but the basics are still a challenge in terms of quality. “There is still a significant amount of illiteracy, particularly among women,” she says. In the poorer parts of the world, according to Jaime Saavedra of the

Figure II. Poor today, rich tomorrow?

Relationship of overall scores to GDP per head



Source: The Economist Intelligence Unit

World Bank, “the number-one priority is improving learning outcomes in basic education, which is the foundation for future skills.”

Bucking the trend

Some education systems in the developing world, however, have paid

considerable attention to future-skills education despite resource constraints. Chile is a case in point: its GDP per head of only US\$17,000 belies its 13th-place rank, ahead of considerably wealthier places such as Norway, the US, Israel and Spain.

A handful of lower-income economies punch above their weight in different

index categories. Kazakhstan, for example, a middle-income economy, ranks 11th in policy environment. China performs as might be expected given its income level and outranks the US and other wealthier economies in some teaching environment indicators, such as quality of teacher education. Perhaps more impressive are the 12th- and 14th-place policy environment ranks of the Philippines and Ghana, respectively, both classed as low-income economies. Both receive relatively high marks, for example, for their attention to future skills in national education strategy as well as the assessment frameworks they are building to support future-skills training.

Figure III. Rise of the underdogs

Overall rank in relation to rank by GDP per head (difference)

| TOP OVERACHIEVERS | | TOP UNDERACHIEVERS | |
|-------------------|------|--------------------|------|
| Ghana | +21% | Saudi Arabia | -20% |
| Colombia | +16% | UAE | -17% |
| Mexico | +13% | US | -15% |
| Philippines | +13% | Norway | -13% |
| Chile | +10% | Iran | -11% |

Source: The Economist Intelligence Unit

Box II. Spotlight on Shanghai: China's education champion

In Shanghai, China harbours what has been one of the world's top-performing school systems, judging by previous Programme for International Student Assessment test results.¹ As one of four regions accorded special administrative privileges by the central government, Shanghai's educators have pursued reforms over the past decades that have shifted national goalposts for what is considered academic success. Some of the region's achievements create a solid foundation to deliver future-oriented skills, locally and potentially nationally, should policymakers eventually implement Shanghai's reforms elsewhere.

Shanghai's greatest strength is its teachers, and the support and guidance they receive from regional administrators. International experts have praised Shanghai's approach to developing and managing teachers, which involves rigorous qualification standards, extensive in-service training, the widespread use of mentor teachers and a well-developed performance evaluation system.² Shanghai's teaching standards are one reason why China as a whole achieves a relatively high rank of 13th in the index when it comes to quality of teacher education. (It also on a par with several high-income economies, including

Australia and the US, in the quality of school administration.)

According to the World Bank, Shanghai's educators recognise the need to move beyond academic performance and help their students improve their social and emotional wellbeing, their environmental consciousness, their creativity and, ultimately, their appreciation of what global citizenship means.³ Should this translate into concrete action, Shanghai could prove a pioneer for China's future-skills education efforts.



¹ Shanghai students posted the highest mean score globally for maths, science and reading in both 2009 and 2012 (in 2015 the OECD grouped it with three other Chinese regions to form a composite national score). See *PISA 2009 Results: Executive Summary* and *PISA 2012 Results in Focus: What 15-year-olds know and what they can do with what they know*, OECD

² See, for example, Nick Morrison, "What We Can Learn From The Success of Shanghai's Schools", *Forbes*, February 5th 2014

³ *How Shanghai Does It: Insights and Lessons from the Highest-Ranking Education System in the World*, The World Bank, 2016

Chapter 1. Thinking outside the policy box

Of the different stakeholders involved in any type of education reform, policymakers bear the lion's share of responsibility for setting the ship on the right course. So it is when it comes to the teaching of future skills: virtually all education systems are guided by a national education strategy. Few such strategies, however, currently prioritise the teaching of the types of future skills covered in this research. In the index, just six economies—Finland, Canada, Chile, New Zealand, Singapore and Sweden—earn perfect marks for the coverage and importance their national education strategy affords 21st-century skills. In the rest of the index economies, the education strategy covers some but not all skills, or has yet to address them at all.

As we prepare our students for the future, it is critical that we also strengthen our values-based education. We want our students to learn socio-emotional skills, such as communication, perspective-taking and active listening, that enable them to engage in meaningful dialogue, appreciate diversity and develop respect for one another.

ONG YE KUNG

Minister for education, Singapore

Articulating future-skills objectives in strategy is just a first step to meeting them. Supportive curriculum and assessment frameworks must also be in place. In both these areas, the index focuses not just on the scope of future skills covered but also on the extent to which the frameworks emphasise problem-based learning—an approach in which students are challenged to solve difficult problems through self-directed learning, in the process broadening their knowledge. Such frameworks are extensively developed in Finland and Switzerland, as well as in Singapore and Sweden.

Agile policy

Another important attribute of the future-skills policy environment is flexibility, for the simple reason that skills requirements will continue to change and must be constantly adapted. “There are occupations that haven’t emerged yet,” explains Jim Knight of TES Global, an education services provider. “We can’t possibly anticipate all of them now and put them into a traditional curriculum. We have to think flexibly about how we have a more agile curriculum that focuses on the basics and creates the mind-set of continuous adaptation.”

This fluidity of workforce skills requirements means that strategy, curriculum and assessment frameworks

should be reviewed periodically; these reviews constitute a new set of indicators in this iteration of the index. When it comes to the future-skills elements of strategy itself, most governments covered by the index have conducted a review in the past year (even if those elements are not yet fully developed). Fewer than half have done the same for future-skills curriculums and assessment frameworks, however.

Here, too, lower wealth levels need not hamstring policy flexibility. Policymakers in Ghana, India, the Philippines, Vietnam and other low-income economies have reviewed the curriculum framework for future skills in the past year. Brazil, Colombia, Ghana, India, Kazakhstan and the Philippines have done the same for their assessment frameworks. Conversely, some high-income economies—such as Canada, France, Israel and South Korea—have reviewed neither their curriculum nor their assessment framework in at least three years.

Releasing the pressure valve

Such reviews can serve economies seeking to rebalance their education models away from a rigid, exam-based focus toward one that emphasises other forms of learning. It helps explain why Singapore, for example, has recently conducted reviews across all the key policy areas, and in general is devoting

Figure IV. Look again

Time elapsed since reviews of education strategy, curriculum and assessment were last conducted, in years.

- 1** Review conducted within the past year
2 Review conducted within the past two years
3 Review conducted within the past three years
3+ Item not reviewed in more than three years, item does not exist or item is not publicly available

| RANK | ECONOMY | STRATEGY REVIEW | CURRICULUM REVIEW | ASSESSMENT FRAMEWORKS REVIEW |
|------|--------------|-----------------|-------------------|------------------------------|
| 1 | Finland | 1 | 1 | 1 |
| 2 | Switzerland | 1 | 1 | 1 |
| 3 | New Zealand | 1 | 1 | 1 |
| 4 | Sweden | 1 | 1 | 1 |
| 5 | Canada | 1 | 2 | 3+ |
| 6 | Netherlands | 1 | 3+ | 1 |
| 7 | Germany | 1 | 2 | 1 |
| 7 | Singapore | 1 | 1 | 1 |
| 9 | France | 1 | 2 | 2 |
| 10 | UK | 1 | 1 | 1 |
| 11 | Australia | 1 | 1 | 1 |
| 12 | Japan | 1 | 1 | 3+ |
| 13 | Chile | 1 | 2 | 2 |
| 14 | Norway | 1 | 1 | 3+ |
| 15 | Hong Kong | 1 | 1 | 3 |
| 16 | South Korea | 1 | 3 | 2 |
| 17 | Taiwan | 1 | 1 | 2 |
| 18 | US | 1 | 2 | 2 |
| 19 | Mexico | 1 | 3 | 1 |
| 20 | Colombia | 1 | 1 | 1 |
| 21 | Costa Rica | 2 | 3 | 2 |
| 22 | Italy | 1 | 1 | 3+ |
| 23 | Israel | 1 | 2 | 3+ |
| 23 | Spain | 2 | 3 | 1 |
| 25 | Ghana | 1 | 1 | 1 |
| 26 | Russia | 1 | 1 | 1 |
| 27 | Poland | 1 | 1 | 3+ |
| 28 | Philippines | 1 | 1 | 1 |
| 29 | UAE | 1 | 1 | 1 |
| 30 | Malaysia | 2 | 3 | 3+ |
| 31 | Brazil | 1 | 2 | 1 |
| 32 | Kazakhstan | 1 | 1 | 1 |
| 33 | South Africa | 3 | 1 | 2 |
| 34 | Peru | 2 | 2 | 2 |
| 35 | Argentina | 2 | 3+ | 1 |
| 36 | Thailand | 1 | 3+ | 3+ |
| 37 | Vietnam | 1 | 1 | 2 |
| 38 | Turkey | 1 | 2 | 3 |
| 39 | China | 1 | 1 | 3+ |
| 40 | India | 1 | 1 | 1 |
| 41 | Kenya | 3+ | 1 | 3+ |
| 42 | Saudi Arabia | 3 | 3+ | 3+ |
| 43 | Indonesia | 1 | 3+ | 2 |
| 44 | Ethiopia | 3 | 3+ | 3+ |
| 45 | Bangladesh | 3 | 3+ | 3+ |
| 46 | Egypt | 3+ | 3+ | 3+ |
| 47 | Nigeria | 2 | 3+ | 3+ |
| 48 | Algeria | 3+ | 3+ | 3+ |
| 49 | Iran | 3+ | 3+ | 3+ |
| 50 | Pakistan | 3 | 3+ | 3+ |

Source: The Economist Intelligence Unit

considerable attention to future-skills policy. “We recognise the downside of an over-emphasis on grades and exams, and are taking steps to dial it back,” says Ong Ye Kung, Singapore’s education minister. This includes, he says, changing the scoring system for school-leaving exams, and enabling university admissions to be determined by more than just exam grades.

More broadly, governments in East Asia are realising the detrimental effects that high-stakes exams are having on children, according to Christine Min Wotipka of Stanford University. “They’re also realising that there are other prices to pay for this heavy exam focus,” she adds, such as inequality bred when not all families can afford to pay for exam courses on weekends and in evenings.

What businesses can do

The private sector has a role to play in shaping future-skills learning, often filtered through partnerships with non-governmental organisations (NGOs) or individual educational institutions. University-industry collaboration is well developed in Europe, North America and East Asia (including China), where design of new university courses is often the result of consultation with business groups, or even individual companies. Germany and the UK score highest in this index indicator.

Education policymakers, however, do not often engage directly with business leaders for advice on future-skills needs. Several experts interviewed for this report think that they should. One is Jennifer Blanke of the African Development Bank: “In Africa and everywhere else, economies are changing fast, and the private sector has a much better idea of what sorts of skills they will need. You’re shooting yourself in the foot if you’re not bringing them into the discussion.”

Asian policymakers now realise that the focus should not just be on hard work and cognitive skills. Students need to change from being consumers to co-creators of the system from early on. This is where 21st-century skills such as critical thinking, creativity, collaboration and digital skills are gaining traction.

BRAJESH PANTH

Asian Development Bank

Vicky Colbert of Fundación Escuela Nueva, a Colombia-based NGO, believes that governments in Latin America do not sufficiently appreciate the constructive role that businesses

can play in understanding changing curriculum needs, and also in providing some future-skills training. “Education is so important that you cannot leave it in the exclusive hands of governments. The private sector and civil society can step in and compensate for some weaknesses of government in bringing about change in this area.” She offers as examples the provision of training in the arts or in English as a second language: “Ministries and education departments [in Latin America] would benefit from alliances with other entities that are more suited to designing this and can deliver it in a more ambitious way.”

Box III. Putting the work into study: Aligning education to the jobs of tomorrow

“Few education systems do well in aligning training and work,” says Simon Marginson of the University of Oxford. Most produce a miscellany of graduates for a miscellany of labour market roles, he maintains: “It’s rare that training specialisations fit closely with actual work content.”

A dearth of relevant information contributes to the difficulties educators face in achieving such alignment. “Students should know exactly what the labour market returns are by career and by type of training,” says the World Bank’s Jaime Saavedra. “There is very little information out there, and we need much more.”

As occupational roles and requirements change under the influence of technology advancement, it is not enough just to collect such information; it should be updated continuously. Almost all economies in the index maintain some form of national database on labour market outcomes for different types

and levels of educational attainment—among the new index indicators in the current iteration. However, in only seven economies are such databases updated at least monthly, and six semi-annually. In the rest, databases are refreshed no more than once a year, or they do not exist at all.

Plan ahead, but flexibly

Such information systems have a built-in limitation: they can only provide a picture of occupational outcomes today. What about future occupations and outcomes? Arguably such analysis can only be based on guesswork, but that is not deterring some policymakers from trying to ensure future alignment between training and outcomes. The Singapore government, for example, is including training and skills plans in the “transformation maps” that are meant to guide the long-term development of its main industries.⁴ “The education

ministry and our institutes of higher learning are constantly in touch with industries to develop curriculum, offer meaningful internships, and provide the right education and career guidance to students,” says Ong Ye Kung, Singapore’s education minister.

Worthy as such endeavours are, Mr Marginson is doubtful that a high level of alignment is achievable between education and future labour market needs. Individual pathways, he says, are often determined by factors such as personal networks, individual persistence, and even luck and timing, rather than by rational alignment between training and jobs. “Flexibility and adaptability are therefore essential,” he says, “and in this context, ensuring that graduates have good generic skills is very important.”

Sarah Brown of the Global Business Coalition for Education, a non-governmental organisation, emphasises that flexibility is paramount in seeking to understand future occupations. The organisation is involving business in efforts to shed light on those, and to advise governments on adapting education systems accordingly.⁵ Above all, she says, flexibility is required on the part of tomorrow’s workers: “Jobs will be constantly changing, and learning how to learn will be just as important a skill as any digital one.”

Figure V. Unfinished business
Databases on educational attainment and labour market outcomes

| UPDATED MONTHLY | | UPDATED SEMI-ANNUALLY | |
|-----------------|---------|-----------------------|------------|
| Canada | Finland | Australia | Kazakhstan |
| France | Germany | New Zealand | Poland |
| Netherlands | Sweden | South Korea | Spain |
| US | | | |

Source: The Economist Intelligence Unit

⁴ See, for example, Security Industry Transformation Map, SkillsFuture Singapore and Workforce Singapore, February 13th 2018
⁵ One manifestation of this is a report the organisation published in September 2018 in collaboration with Deloitte, a consultancy: *Preparing tomorrow's workforce for the Fourth Industrial Revolution*



Chapter 2. Continuous learning in the face of change

At School 21 in east London, oracy—the ability to speak fluently and grammatically—has been established as a core competency, equal to reading and writing. Students assess each other's oratory skills, and teachers are being trained to facilitate the open classroom environment necessary for this. According to the school's headmaster, students must learn how to argue and advocate with confidence, individually and in groups. In the UK—a strong performer in the teaching environment category of the index—the school is held up as a model for how to challenge conventional methods of teaching and learning.⁶

The challenges that teachers face in adapting to such new methods should not be underestimated, yet the ultimate success of future-skills education rests heavily on their ability to do this. "Updating curriculum should always be on the agenda," says Jaime Saavedra of the World Bank. "But it is incredibly urgent to invest in changing the behaviour of teachers and improving what happens inside the classroom."

For Ms Wotipka, this means moving away from the traditional lecture and rote memorisation format, where teachers sit at the front of the class and students sit at desks. "It means facilitating group work and team work. It involves students coming up with their own projects and using design thinking and a different, creative set of tools to tackle real-life

problems. It does not mean conveying bits of information to students, or teaching STEM (science, technology, engineering and mathematics), arts or other subjects in separate 50-minute blocks."

If you transport a doctor from a hundred years ago into a hospital today, that doctor will be lost because everything has been changed in medicine. If you put a teacher from a hundred years ago into a classroom today, he or she will find that not much has really changed.

VICKY COLBERT

Fundación Escuela Nueva

It is now almost axiomatic that young people's future career paths will need to involve continuous learning, and that they therefore need to "learn how to learn".⁷ Teachers are faced with similar demands. High-scoring economies in the teaching environment category are those such as Canada and New Zealand, where not only are teachers at upper-secondary level required to participate in in-service education programmes, but those programmes include training in the future-oriented skills that are the focus of this study.

Beyond school walls

Future-skills learning does not only happen inside the classroom. Extra-curricular activities, such as sport and academic competitions, are fertile ground for developing leadership, team work and other skills. Sport-mad New Zealand and Australia excel in a new athletics indicator and in the extra-curricular activities sub-category more broadly. Meanwhile, academic competitions such as Model UN are a common feature of education in many middle- and low-income economies as well as wealthier ones.

"I can't stress enough the importance of extra-curricular activities, including athletics, for inculcating 21st-century skills," says Ms Wotipka. "I would even advocate encouraging school systems to become more like summer camp, where the focus is on kids learning while having fun and working together." She acknowledges that most education systems would hesitate to adopt this approach, as "it's not how we currently measure educational progress and success." A more realistic objective is encouraging a reduced focus on homework and more time allowed for after-school activities. Ms Wotipka cites schools in Palo Alto, California, in the heart of Silicon Valley, that are scheduling fewer classes and allowing students more time for other group activities such as athletics or working on the school newspaper.

⁶ See Helen Warrell, "School 21: 'free school' where circle time beats exam coaching", *Financial Times*, November 3rd 2015 and Toby Baker, "School 21: Doing things differently in East London", Nesta website, October 30th 2017

⁷ See, for example, "Lifelong learning is becoming an economic imperative", *The Economist*, January 12th 2017

Increased emphasis on non-class activities works not only for secondary-level students, according to Sarah Brown of the Global Business Coalition for Education. She points to the traction that after-school clubs, which cater to primary and secondary school students,

are gaining in the US and UK, including in high-poverty areas with low-performing schools, with some evidence of better school attendance and better academic results. In research published in 2016, UK experts found that attendance in such clubs is associated with positive

academic and social outcomes, particularly for disadvantaged children. Its findings also suggest that children who participate in organised sport and other physical activities have better social, emotional and behavioural skills than those who do not.⁸



⁸ Emily Tanner et al, *Can out of school activities close the education gap?*, National Centre for Social Research and Newcastle University, 2016

Box IV. I, robot teacher: The role of AI in teaching for tomorrow

Will machines powered by artificial intelligence (AI) replace human teachers in the classroom? Some educators believe this will come to pass as early as a decade from now.⁹ But if AI looks attractive to some education policymakers, one reason may be that a shortage of high-quality teachers at primary and secondary levels is causing headaches in the developing world and some parts of the developed one.¹⁰ Wang Yi of Liulishuo, an AI-based English-language learning platform for native Chinese speakers, has developed his platform to fill this gap.

Within the foreseeable future, AI is more likely to complement teachers than replace them, experts say. AI tools are emerging, for example, that enable teachers to create personalised

textbooks and other types of curriculum for individual pupils.¹¹ Brajesh Panth of the Asian Development Bank foresees a role for AI in teacher training, for example. He notes that education experts in Japan, for instance, are considering the use of tools designed to improve teachers' and students' social and emotional skills.

Far from robots replacing teachers, such uses of AI could help overly robotic teachers to break out of their rote-teaching straitjackets. There are also areas within the broad teaching profession in which AI could play more than an augmentative role, such as in teaching a foreign language, as Mr Wang's platform aims to do. "The AI teacher may not beat the best human teachers," says Mr Wang,

"but it certainly beats the average one." He notes that AI can also pick up students' mistakes more efficiently, and make recommendations on better vocabulary and pronunciation. Currently its key shortcoming, he says, is a lack of emotional intelligence: the ability to provide feedback to students with sensitivity.

Asia's traditional education systems in particular will need to become receptive to innovations such as these in order to teach future skills, such as STEM (science, technology, engineering and mathematics) and languages, more effectively (for more on languages, see box V). "There's no more room to teach or learn harder," Mr Wang says. "Instead, [teachers] have to teach and learn smarter."



⁹ See, for example, John von Radowitz, "Intelligent machines will replace teachers within 10 years, leading public school headteacher predicts", *The Independent*, September 11th 2017

¹⁰ "The world needs almost 69 million new teachers to reach the 2030 education goals", UNESCO Institute for Statistics, October 2016; see also "Why are people talking about a teacher shortage in New Zealand?", World Education Blog, April 4th 2018

¹¹ Matthew Lynch, "5 Examples of Artificial Intelligence in the Classroom", *The Tech Advocate*, August 22nd 2017

Box V. Toppling the Tower of Babel: The importance of language learning in future education

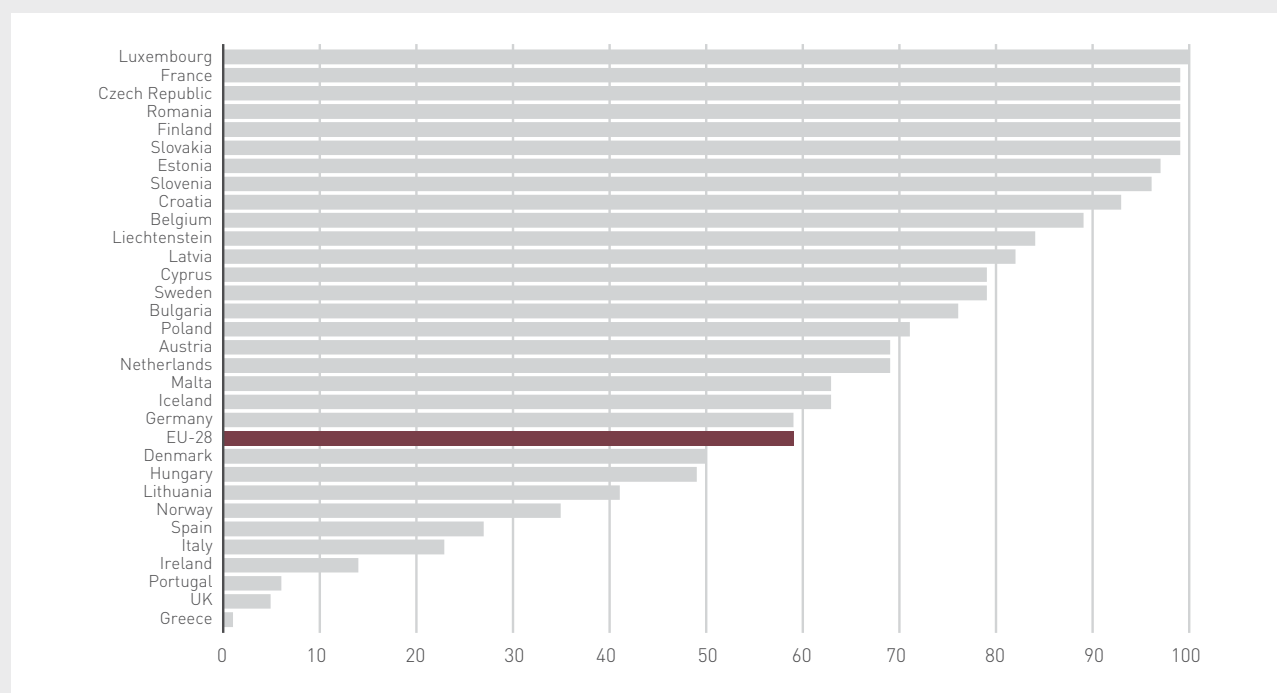
"A language is far more than a means of communication; it is the very condition of our humanity." These words were spoken by the UNESCO director-general Audrey Azoulay in February 2018 on the occasion of "International Mother Language Day", which was

created by that body two decades earlier to celebrate linguistic diversity and the promotion of multilingual education.¹² Bilingualism and multilingualism (the latter defined as proficiency in three or more languages) are widely considered to be 21st-century skills, necessary

to enable people from widely different backgrounds to engage in dialogue and collectively address pressing global challenges. Almost by definition, then, a global citizen is one who speaks, or at least has proficiency in, two or more languages.

Figure VI. Speaking in tongues

% of upper-secondary students in Europe learning two or more foreign languages, 2015



Source: Eurostat

For this reason, a global language education indicator now forms part of the index, with the highest score reserved for systems that require upper-

secondary students to study at least one foreign language. For all but English-speaking economies, that compulsory second language should be English to

earn the top score. Twenty-two meet that criterion, although the emphasis on English is not without controversy.

¹² "UNESCO message for the International Mother Language Day", UNESCO website, February 21st 2018

Lingua angla?

Expert views differ on the virtue of pushing students to study English. Vicky Colbert of Fundación Escuela Nueva, a non-governmental organisation, believes that in Latin America, education systems have no choice, citing as one benefit wider exposure to international research in different fields. "In education, for example, many of the most important publications are in English. Many education faculties in Latin America only read books published in Mexico or Argentina. Those books may be good, but it's important to be exposed to international literature."

I'm very worried that the world's lingua franca is English, because it means that students in places like America won't learn foreign languages, and it's critical that our next generation is able to think inter-culturally.

ALLAN GOODMAN

Institute of International Education

For Rajika Bhandari of the Institute of International Education, the question of how forcefully to push English-language learning is complex. It's critical, she agrees, that students learn foreign languages. But requiring

study of English is, she says, a double-edged sword: "On the one hand, more provision in English makes education more accessible to everybody around the world. But will there be enough of an imperative for students to become competent in multiple foreign languages?"

There are also concerns that gaining English proficiency can hold some students back in their careers if it has been at the expense of learning in the native language. A 2016 report published by the Education Commission, a UN-sponsored panel, found that half of children in low- and middle-income economies are not taught in their mother tongue.¹³ According to Dorothy Gordon, formerly of the Ghana-India Kofi Annan Centre of Excellence in ICT, learning in one's native language helps students better grasp a range of different subjects. "Many parents in developing countries think that the earlier they put their children into an English-medium school the better, but they're seeing that later on in the educational system this gives children problems." Some academics believe the same is true in Europe.¹⁴



¹³ *The Learning Generation: Investing in Education in a Changing World*, The International Commission on Financing Global Education Opportunity, 2016

¹⁴ For a summary of such views, see Michele Gazzola, "Why teaching in English may not be such a good idea", *The World University Rankings*, November 22nd 2017



Chapter 3. Better students, better citizens

In our 2017 report, we emphasised the complementary relationship between the openness of societies and their ability to prepare youth for the challenges they will face in future. No economies are paragons of virtue in ensuring gender equality, environmental stewardship, intolerance of corruption and press freedom—to name a few of the indicators in the socio-economic environment category. The overall index leaders, however, do more than the rest to strengthen the legal and attitudinal norms of open societies. (Singapore is a partial exception, with relatively low scores in such indicators as press freedom and freedom of association.) This creates a solid environment in which their education systems can instil positive civic values in young people, including values of global citizenship. The Nordic economies, New Zealand and Canada earn the highest scores in this category.

Different yet the same

Every society is different, but some values—notably acceptance of cultural diversity and tolerance of people with different backgrounds, beliefs and sexual orientations—are universal. These should be reflected in classroom and extra-curricular activities of students everywhere. Young people's inculcation with such values is especially needed to combat the nativism and xenophobia

currently rearing their heads in many parts of the world. A handful of new diversity and tolerance indicators have been added to the index to reflect this, including those measuring attitudes toward immigrants, ethnic minority groups and LGBT individuals.

Fostering open attitudes towards diversity is, of course, not exclusive to Western societies. "Tolerance is not a Western value," says Dorothy Gordon, an education consultant in Africa. "It's something that has been traditionally emphasised in many African training systems. In Ghana, civics is taught from primary level onward, to foster nation-building and understanding of the values of different communities." This may explain why Ghana compares favourably with several Western economies in areas such as religious tolerance and attitudes toward immigrants, although the same cannot be said of its score in some other diversity indicators, such as attitudes toward LGBT people.

Civics courses have been the primary vehicle through which education systems have traditionally sought to foster community and global awareness in students. As such, civic education may be considered a safeguard of the different types of civic freedoms covered in the index. Measuring its outcomes is not straightforward, however, according to Kei Kawashima-Ginsberg of Tufts University. "Civics are hard to test on

paper. Much of it involves becoming engaged in community work or activism, which is done in groups."

Positive civic education outcomes typically manifest themselves in, for example, student participation in environmental initiatives, local elections, volunteer work with the elderly or disabled, fund-raising for charities and other, mostly local activities. Less frequent, but perhaps more widely covered, are forms of political activism in which students take to the streets on their own initiative. It is not clear, according to some experts, to what extent school-based civics courses lead to such outcomes, but good civic education can at least provide an analytical framework for students to make independent decisions about them (see box VI).

Trading places

Interaction with foreign students, abroad and at home, naturally contributes to broader understanding of different cultures, and thus to the development of global citizens. OECD economies such as the US, UK, Australia, New Zealand, Canada and France have long been favoured destinations for overseas students from all parts of the world, particularly at tertiary level. There could, however, be some changes in the established directions of travel in future, as many non-Western economies are

Box VI. Calls to action: Educating for civic initiative

When students at Parkland High School in Florida organised a national protest to appeal for tighter gun control in the US in the wake of the February 2018 shooting that took 17 lives, they were exhibiting a very visible form of civic activism.¹⁵ It was not unique. In August of the same year, for example, students in Bangladesh took to the streets of Dhaka to demand better road safety after a spate of deadly traffic accidents in the capital.¹⁶ There are countless other instances around the world—most far less visible than these—of students taking an active role in their communities, in initiatives ranging from environmental sustainability to homelessness, elderly assistance, public safety and other areas.

Jaime Casap of internet giant Google believes that such activism offers hope that today's youth will be able to tackle the tough global challenges that lie ahead. "This is the first 'problem-solving' generation," he says. Society's problems, holds Mr Casap, are more visible to young people today, thanks to the internet and social media, than perhaps they were to earlier generations.

Steven Cohen of Columbia University points out that students in the 1960s and later generations became activists in the face of similarly tough

geopolitical and social challenges. But, he says, young people today get images, news and calls to action on an hourly basis. "We don't know what this will do for their collective consciousness," he says, "but in areas such as climate change, we're beginning to see an awareness develop of its importance" and an understanding that collective action is required to protect it.

We have to stop asking kids what they want to be when they grow up, because jobs are always changing and moving, thanks to technology. What we should be asking them is, what problem do you want to solve?

JAIME CASAP

Google

From the classroom to the barricades?

It is not clear how or even whether civic education in the school gives rise to the aforementioned types of student activism. In a study of Australian students published in 2017, Frank

Reichert of the University of Hong Kong found that schools account for a small share in students' willingness to participate in future civic and political action.¹⁷ Interaction with family or peers, he says, play a larger role in students' civic activism than what they learn in school.

This is not to say, however, that school has no role to play in such activism. "The primary role of school is to help young people to acquire a certain level of civic knowledge so that they can understand and interpret what is going on," says Mr Reichert. Beyond that, he finds that teachers are often uncomfortable promoting active participation in political initiatives, for understandable reasons.

"Students shouldn't be pressured to participate in civic activities," he says, "but teachers who themselves follow what's going on in the world and discuss difficult topics with their students can help build a framework for them to make their own decisions about whether and how to become involved."

¹⁵ Richard Luscombe, "Parkland students target midterms with summer gun control road trip", *The Guardian*, June 4th 2018

¹⁶ Sugam Pokharel, Farid Ahmed and Bard Wilkinson, "Bangladesh protests: How students brought Dhaka to a standstill", CNN, August 6th 2018

¹⁷ Frank Reichert and Murray Print, "Civic participation of high school students: the effect of civic learning in school", *Educational Review*, May 11th 2017

seeking to become international student destinations in their own right.

“China, India and Malaysia, for example, all have a great appetite to internationalise higher education systems” points out Rajika Bhandari of the Institute of International Education. “China may be the world’s largest ‘supplier’ of international students, but it’s also now becoming one of the top hosts.” Investments are also being made

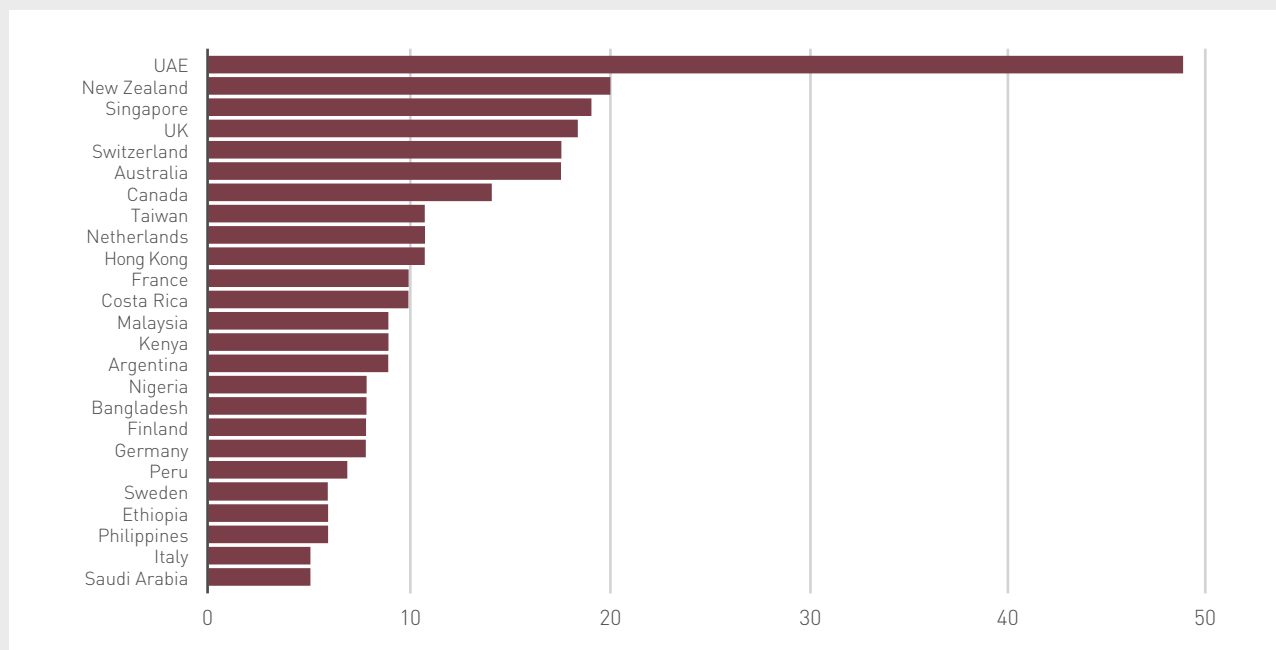
in all three places, she notes, to attract international faculty as well as students, partly through the establishment of partnerships with Western universities. The UAE is pursuing similar policies, and already possesses a heavily internationalised student population as a share of its total student body.

Meanwhile, there are indications that leading Western destinations are losing some of their lustre. International

enrolments in US universities declined in 2017,¹⁸ and the British Council anticipates that the UK’s higher education sector will struggle to maintain its current inbound flows of students for the next decade.¹⁹ There are several contributory factors at play, but hardening attitudes toward overseas students in the current US administration, and Britain’s impending departure from the EU, are unlikely to enhance international perceptions of both systems’ openness.

Figure VIII. Academic watering holes

International students as % of total students, 2017 or latest available year



Source: UNESCO

¹⁸ Elizabeth Redden, “International Student Numbers Decline”, *Inside Higher Ed*, January 22nd 2018

¹⁹ “International student mobility to grow more slowly to 2027”, British Council website, February 1st 2018

Conclusion. A passport to global citizenship

Viewed from an education policymaker's perspective, education may be thought to have two overarching goals. One is to give individuals the knowledge and tools to realise their professional and personal objectives in life. The other is to ensure that the organisations that comprise the economy, government and civil society have the talent they need to pursue and meet their objectives. In addition, national leaders in many parts of the world have long posited a third objective, which is an extension of the second: that the education system should work to enhance the economy's international competitiveness.

Does recognition of the need to provide young people with 21st-century skills affect the balance between these objectives? Many educators and policymakers are coming around to the view that a single-minded pursuit of economic competitiveness—manifested in a heavy educational focus on cognitive and technical skills, as well as exam results—has in some cases been detrimental to individuals' personal development. It may also, as suggested by some experts, have had negative impacts on people's health and wellbeing. Singapore's government, for one, appears to be trying to redress the balance somewhat with lifelong learning initiatives tailored to citizens' work and personal goals.

The national competitiveness imperative is not going away. "Governments are

revisiting their exam-oriented systems," observes Brajesh Panth of the Asian Development Bank, "but they are also considering how education can help their economies keep pace with rapid technological change as inherent, for example, in the push to implement 'Industry 4.0' strategies."²⁰ Efforts to teach future skills are viewed in this context by many governments, he notes. Friction between national and other education objectives will thus remain, but educators must ensure that efforts to foster people-oriented, creative and civic-minded skills are not sacrificed on the altar of national competitiveness.

What of the development of globally oriented skills and values? Foreign languages, civic awareness and global-citizenship skills form part of the curriculum in many, though far from all, education systems assessed in this index. Recognition of the global nature of the environmental, demographic, technological and other challenges confronting current and future generations underpins the importance that educators ascribe to global citizenship and 21st-century skills.

All this gives some educators grounds for optimism that the values of global citizenship will flower in future years and co-exist in balance with the national and diverse local values of peoples and cultures. The commitment to teach internationally oriented skills

and values will require great resilience, however, as they are coming under serious and aggressive pressure from the forces of nativism and ethno-nationalism. Future-skills education must thus become a passport to global citizenship in order to truly be of benefit for people and broader society.

²⁰ Industry 4.0 refers to a set of initiatives, originally developed in Germany but now followed by organisations around the world, to fully digitise manufacturing

Appendix. Index methodology

The Worldwide Educating For the Future Index is a benchmarking exercise that objectively compares the commitment of governments to develop and promote education that equips youth with skills for the economic and social demands of tomorrow. The index covers 50 economies around the world across the development spectrum. The index scores economies across three categories: policy environment, teaching environment and socio-economic environment. The indicators fall into two broad categories:

- Quantitative indicators: 13 of the index's 21 indicators are based on quantitative data, for example, government expenditure on post-secondary education per student as a share of GDP per head.
- Qualitative indicators: eight of the index's 21 indicators are qualitative assessments of an education system's orientation towards future skills, for example, "Availability of career counselling for youth in schools", which is assessed on a scale of 1-3, where:
 - 2=career counselling services are widely prevalent at schools, with schools mandated to dedicate resources to counselling and offer courses that teach students how to look for jobs.
 - 1=career counsellors are prevalent at schools, though policy support for

counselling is lacking or inconsistent across schools.

- 0=career counselling is not a priority and not prevalent at schools.

To focus the analysis, the index assesses education for youth aged 15-24 (post-secondary level). The 50 economies selected represent 93% of global GDP and over 6bn people. We objectively selected countries based on four major factors:

- Impact: big education systems, youth populations and economies.
- Necessity: economies susceptible to automation and demographics crunches.
- Balance: a mix of economies from different regions and levels of development.
- Comparison: automatic inclusion of the 2017 index's 35 economies.

Data sources

The Economist Intelligence Unit's research team collected data in June-August 2018. Wherever possible, publicly available data from official sources are used for the latest available year. The qualitative indicator scores are derived from publicly available information (such as government policies and reviews) and

expert interviews. Qualitative indicators are presented on integer scales.

Indicator scores are normalised and then aggregated across categories to enable an overall comparison. To make data comparable, we normalised the data on the basis of:

$$\text{Normalised } x = (x - \text{Min}(x)) / (\text{Max}(x) - \text{Min}(x))$$

where Min(x) and Max(x) are, respectively, the lowest and highest values among the 50 economies for any given indicator. The normalised value is then transformed into a positive number on a scale of 0-100. The same process applies to quantitative indicators, where a high value indicates a better environment for future-oriented education.

Education ministries for each economy were given the opportunity to highlight their efforts to orient their systems around building 21st-century skills. Many ministries refused to provide on-the-record feedback. Where we received official input, we evaluated it in the context of extensive desk research and expert interviews.

Categories and weights

Our research team assigned category and indicator weights after consultations with internal analysts and external education experts. We assessed 21 indicators

across three thematic categories: policy environment, teaching environment and socio-economic environment.

We allocated 30% of the index weight to the **policy environment** category. The indicators in this category assess the extent to which government policy explicitly calls for educating for the future. Education strategy, curriculum, assessment and implementation are considered in this category.

The largest category, **teaching environment**, accounts for half of the index. Within this category, quality of teacher education is the largest single indicator, accounting for 15% of the category. Other indicators similarly assess the quality of teaching, support for teachers and extra-curricular programmes.

The final category, **socio-economic environment**, measures the extent to

which societies are prepared to educate youth for the skills of tomorrow. Indicators in this category assess gender equality, future optimism, economic freedom, corruption, civic freedom, diversity and tolerance, and environmental stewardship at the societal level.

The following table provides a brief description of indicators, data and weights:

| INDICATOR | SOURCE | RATING | WEIGHT* |
|----------------------------------------------------------------------------------------------|--------------------------|---------------------|--------------|
| 1) POLICY ENVIRONMENT | | | 30% |
| 1.1) National education strategy on skills for the future | | | 35% |
| 1.1.1) Strategy review | EIU analysis | Rating 1-3 | |
| 1.1.2) Milestones and action plan | EIU analysis | Rating 1-3 | |
| 1.1.3) Future skills strategy | EIU analysis | Rating 1-5 | |
| 1.2) Existence of curriculum framework to support educating for skills for the future | | | 22.5% |
| 1.2.1) Curriculum review | EIU analysis | Rating 1-3 | |
| 1.2.2) Problem-based learning in curriculum guidelines | EIU analysis | Rating 1-5 | |
| 1.2.3) Future-oriented learning resources | EIU analysis | Rating 1-5 | |
| 1.2.4) Global language education | EIU analysis | Rating 1-4 | |
| 1.3) Assessment framework to support educating for future skills | | | 22.5% |
| 1.3.1) Assessment frameworks review | EIU analysis | Rating 1-4 | |
| 1.3.2) Assessment frameworks for problem-based learning | EIU analysis | Rating 1-5 | |
| 1.4) Government effectiveness risk | EIU Risk Briefing | Rating 0-100 | 10% |
| 1.5) Youth unemployment | World bank/ILO | % of youth | 10% |

| INDICATOR | SOURCE | RATING | WEIGHT* |
|---------------------------------------------------------------------|--------------------------------------------------------|-----------------------------------------------------------------|--------------|
| 2) TEACHING ENVIRONMENT | | | 50% |
| 2.1) Quality of teacher education | | | 15% |
| 2.1.1) Consistency of teacher qualifications | EIU analysis | Rating 1-3 | |
| 2.1.2) Relevance of teacher education to skills for the future | EIU analysis | Rating 1-3 | |
| 2.1.3) Enrolment in advanced teaching education | UNESCO/EIU analysis | % of tertiary enrolment | |
| 2.2) Quality of school administration | EIU analysis | Rating 1-3 | 10% |
| 2.3) Teacher qualifications, upper secondary | EIU analysis | Rating 1-6 | 10% |
| 2.4) Average teacher salary | | | 10% |
| 2.4.1) Average teacher salary, upper secondary | Various | US\$/year, PPP | |
| 2.4.2) Average salary, university professor | Various | US\$/year, PPP | |
| 2.5) Government expenditure on education | | | 10% |
| 2.5.1) Upper-secondary expenditure | UNESCO/EIU analysis | US\$/student as a share of GDP per head | |
| 2.5.2) Tertiary expenditure | UNESCO/EIU analysis | US\$/student as a share of GDP per head | |
| 2.6) Availability of career counselling for youth in schools | | | 12.5% |
| 2.6.1) Focus on guidance and career counselling | EIU analysis | Rating 1-3 | |
| 2.6.2) National database on education and labour market | EIU analysis | Rating 1-6 | |
| 2.7) Extra-curricular activities | | | 10% |
| 2.7.1) Academic competitions | EIU analysis | Rating 0-4 | |
| 2.7.2) Youth athletics | International Olympic Committee | # of athletes at 2016 Olympics (per 100,000 population) | |
| 2.8) University-industry collaboration (UIC) | Robert Tijssen (Leiden University, Netherlands) | % of UIC research as a share of total publication output | 12.5% |
| 2.9) Classroom technology access | | | 10% |
| 2.9.1) National broadband strategy | EIU analysis | Rating 1-3 | |
| 2.9.2) Broadband access | UNESCO/Gallup/EIU analysis | % of high schools with broadband access | |

| INDICATOR | SOURCE | RATING | WEIGHT* |
|--------------------------------------|----------------------------------------------------|----------------------------------------|------------|
| 3) SOCIO-ECONOMIC ENVIRONMENT | | | 20% |
| 3.1) Gender equality | World Economic Forum | Rating 0-1 | 14.3% |
| 3.2) Future optimism | Gallup | Rating 0-10 | 14.3% |
| 3.3) Economic freedom | | | 14.3% |
| 3.3.1) Property rights | EIU risk briefing | Rating 0-4 | |
| 3.3.2) Freedom of association | EIU risk briefing | Rating 0-4 | |
| 3.4) Corruption | EIU risk briefing | Rating 0-4 | 14.3% |
| 3.5) Civic freedom | | | 14.3% |
| 3.5.1) Underage marriage | OECD Gender, Institutions and Development Database | % of women aged 15-19 that are married | |
| 3.5.2) Civil liberties | EIU Democracy Index | Rating 0-10 | |
| 3.5.3) Freedom of religion | Pew Research Center Government Restrictions Index | Rating 0-10 | |
| 3.5.4) Freedom of press | Reporters Without Borders | Rating 0-100 | |
| 3.6) Diversity and tolerance | | | 14.3% |
| 3.6.1) Community safety net | Gallup | % of respondents | |
| 3.6.2) International students | UNESCO/EIU analysis | % of total students | |
| 3.6.3) Immigrants | Gallup | % of respondents | |
| 3.6.4) Religious tolerance | Pew Research Center Social Hostilities Index | 0-10 score | |
| 3.6.5) LGBT | Gallup | % of respondents | |
| 3.7) Environmental stewardship | Yale Environmental Performance Index | Rating 0-100 | 14.3% |

*Category weights are as a share of the index; indicator weights are as a share of the category. Sub-indicators contribute equally to their respective indicators.

