The Economist Intelligence Unit

Driving the skills agenda:
Preparing students for the future

An Economist Intelligence Unit report, sponsored by Google

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Contents

Executive summary

Evolving business needs, technological advances and new work structures, among other factors, are redefining what are considered to be valuable skills for the future. Determining what these are, however, is far from straightforward.

The very pace and unpredictability of change means that, as Paul Cappon, former president of the Canadian Council on Learning, puts it, "we are not going to be able to predict the skills that people will need in 20 years". Yong Zhao, director of the University of Oregon's Institute for Global and Online Education, agrees, adding that skills are also highly context-dependent and multifaceted.

Another substantial issue when considering which skills will be valuable in the future is deciding who will be assigning that value.

Bearing such constraints in mind, The Economist Intelligence Unit (EIU) embarked on a research programme, sponsored by Google, to examine to what extent the skills taught in education systems around the world are changing. For example, are so-called 21st-century skills, such as leadership, digital literacy, problem solving and communication, complementing traditional skills such as reading, writing and arithmetic? And do they meet the needs of employers and society more widely?

The EIU convened an advisory board meeting of education experts and conducted a series of in-depth interviews. In addition to comments from the advisory board and the interviews, this report draws on data from global surveys of senior business executives, teachers and two groups of students, aged 11 to 17 and 18 to 25. The key findings are listed below.

1 Problem solving, team working and communication are the skills that are currently most in demand in the workplace.

Sean Rush, president and chief executive officer of JA (Junior Achievement) Worldwide, notes: "Communication and collaboration are essential in a list of 21st- century skills; so much of work in the future will require things to be done across boundaries." The executives surveyed list problem solving (cited by 50%), team working (35%) and communication (32%) as the top three skills that their companies need, and they expect these skills to grow in importance over the next three years.

Digital literacy and creativity—and the latter's close relative, entrepreneurship—are often cited as essential skills for those who will be operating in the network-filled world of the future. Unlike team working and communication, however, very few respondents list these abilities as vital ones in the current workplace.
However, a majority of employers—the only group asked about likely future demand—expect creativity (58%) and digital literacy (57%) to grow in importance in the next three years.

1 Education systems are not providing enough of the skills that students and the workplace need.

Only 34% of executives report that they are satisfied with the level of attainment of young people entering their companies. Even more striking, 52% confirm that a skills gap is hampering their organisation's performance. Older students and those entering the workforce paint a similar picture: among 18-25-year-olds, less than half (44%) believe that their education system is providing them with the skills that they need to enter the country's workforce.

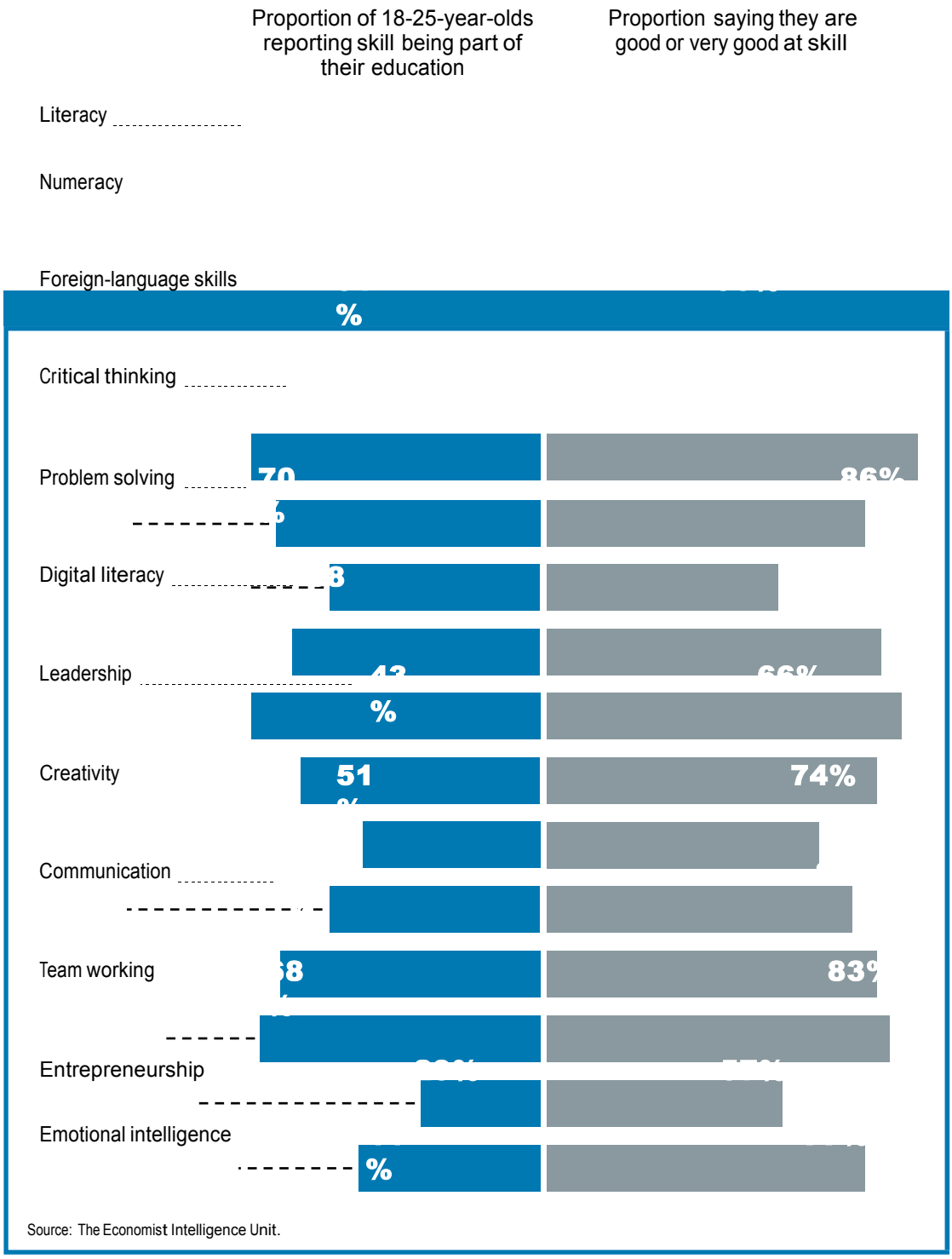
Teachers recognise that companies are unhappy with educational standards

Part of the problem may simply be that many education systems lack the capacity to teach a wider range of skills. Every skill covered in our teachers' survey has seen an increase rather than decline in emphasis over the last five years. Teachers report that lack of time within a strictly regulated curriculum is the biggest barrier to teaching 21st-century skills (49%), while the third most-cited reason is similar: the strict requirements by education authorities that classes focus on literacy and numeracy (30%). This difficulty, however, reflects a lack of innovation in the system as much as a limited number of hours in the day, according to Mr Rush. "The best way to teach 21st-century skills is to embed them in various aspects of the curriculum," not to bolt them on as additional subjects requiring more time, he says.

1 Some students are taking it into their own hands to make up for deficiencies within the education system.

a large majority (77%) are confident or very confident about their career prospects. Similarly, there is a significant difference—in several cases of over
20 percentage points—in the number of students who believe that they have become good or very good at given skills without receiving much formal education in them [see chart].

There may be various reasons for this difference. Several members of our advisory board pointed out that in many countries, notably Asian ones,



high-stakes university entrance tests are a common feature. Those anxious to better their chances therefore turn to private out-of-school tuition, making them less likely to attribute their skills to formal education. Moreover, the young have become more used to learning on their own what they are interested in: 62% of

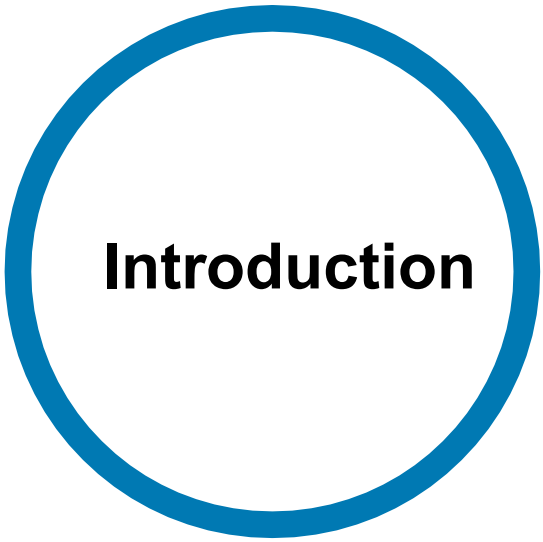
teachers report that students are becoming more independent and able to gather information themselves.

1 Technology is changing teaching, but education systems are keeping up with the transformation rather than leading it.

If changing technology is one of the key drivers in the evolution of which skills are important, what effect is it having on those who teach the skills? On the surface, quite a lot: 85% of teachers report that advances in information technology (IT) are changing the way they teach.

Teachers recognise this as a gap—digital literacy is one of the areas (31%) where they would most like to see further training . A majority of teachers (58%) say their students have a more advanced understanding of technology in their classrooms than they do—

The business executives surveyed agree that broadening access to technology in schools and universities is one of the top three ways in which the education system in their countries could benefit business (31%).



Introduction

As technology becomes more pervasive, traditional trades disappear and the world of work becomes more globalised, interconnected and collaborative, the skills demanded by employers are shifting.

When information is available at the touch of a button, education is arguably less about filling students' heads with knowledge and more about teaching them how to become effective, lifelong learners capable of responding to a fast-paced world of relentless change.
a knowledge-based education system is defunct.
FIN DE LA SOCIEDAD DEL CONOCIMIENTO?

The best education can hope to do is to equip students
with sufficiently transferable skills to be able to respond to whatever the future holds.

"We always think that what we have today is what our children will live with tomorrow," says Yong Zhao, director of the University of Oregon's Institute for Global and Online Education. "But our children will create the future. We need to train people to have the creativity to reinterpret the world."

The 21st-century skills concept has its detractors. Too heavy an emphasis on skills as opposed to content is as imperfect as the alternative.

Programmes such as the Partnership for 21st Century Skills have attempted to delineate the skills required by future graduates and to highlight the gaps between workplace and societal requirements and skills taught in schools. In the OECD's most recent PISA survey, which evaluates global education systems by

comparing the skills and knowledge of 15-year-old students, financial literacy and problem solving are included alongside mathematics, reading and science for the first time ever.

The surveys undertaken to inform this report cover the following list of skills:

- Literacy
- Numeracy
- Foreign-language skills
- Problem solving
- Team working
- Communication
- Critical thinking
- Creativity
- Digital literacy (the ability to find, evaluate, utilise, share, and create content using information technologies–such as computers–and the Internet)
- Leadership
- Emotional intelligence (the ability to understand the feelings of others and react accordingly)
- Entrepreneurship

> Workplaces are becoming more team-oriented.

Patrick Griffin, chair, Education (Assessment), University of Melbourne

1 What skills will the future demand?

The lives of today's students are very different from the lives of students for whom the existing education systems were developed. How can education best prepare young people to navigate their way through an increasingly interconnected and complex world in which factual recall will perhaps matter less than their ability to understand differing perspectives?

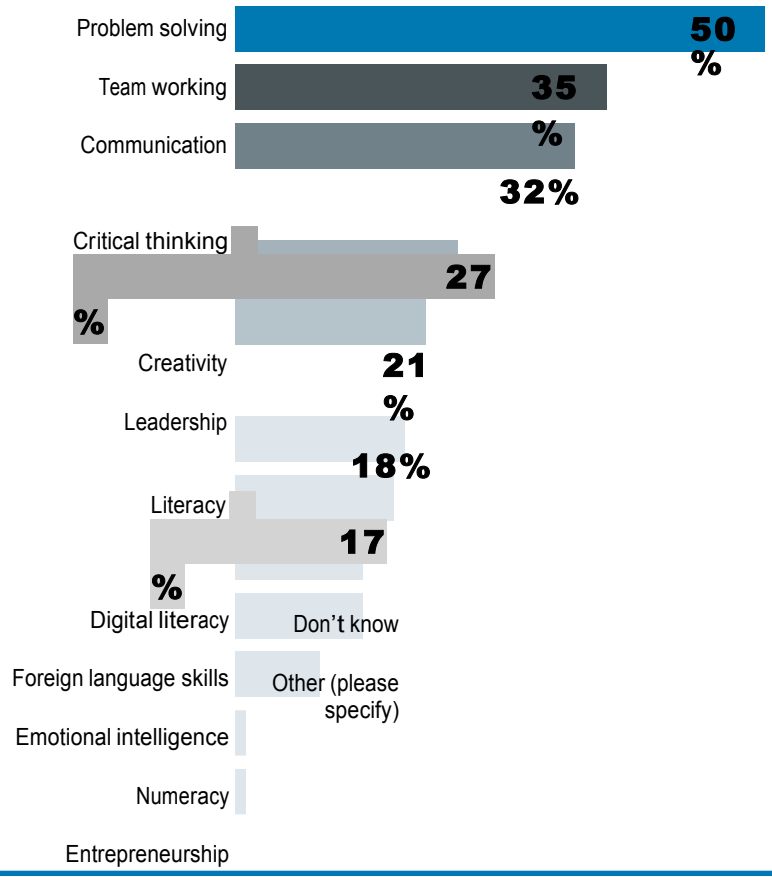
Teachers, students and executives surveyed for this report all list problem solving as the most important skill for students' future. This emphasis is most pronounced among executives, fully 50% of whom place it at the top of the list for potential employees, while 70% expect its importance to increase over the next three years. Teachers appear to be acting on the growing necessity of problem solving, with 59% saying they have placed more emphasis on it in the classroom over the past five years.

If problem solving is to be prioritised as an educational goal, it needs to start early to be effective, ~~teaching the most basic foundational skills with an eye to their practical application.~~ "The school systems that manage to embed problem solving in the curriculum combine real-world contexts with information, for example using maths and science to solve practical problems rather than abstract ones," says Emiliana Vegas, chief of the Education Division at the Inter-American Development Bank. "Good school systems do this as early as pre-school—everything which we used to learn in theoretical terms is contextualised."

Chart 2 (business survey)

Q Which of the following would you say are the most critical skills for employees in your organisation to possess today? Select up to three

(% of respondents)



1%

1%

~~The need for effective problem solving skills is a universal one, according to experts.~~

"From a Ghanaian perspective, students go to school and think their main purpose is to pass exams, but exams are temporary," says Joshua Baku, head of the Research Department at the West Africa Exams Council and general secretary of the Educational Research Network for West and Central Africa. "It's outside the school walls that problems begin. Students need to be taught not

Source: The Economist Intelligence Unit.

to run from problems but to address them and develop solutions."

By encouraging students to work out answers for themselves and to think of the applications and consequences of a theory or decision rather than accepting an answer they are given, schools can build problem solving skills into the way students learn throughout their education.

The high value given to team working, which is placed at the top of the list of skills by 35% of executives and 32% of teachers, reflects the increasingly interconnected way in which we live our lives.

"Workplaces are becoming more team-oriented," says Patrick Griffin, chair of Education (Assessment) at the University of Melbourne.

"It's about understanding how to pool resources and work together. We need to build a curriculum where students can learn to work together—to be responsive to the group, look at their own strengths and weaknesses and those of others and adjust their own behaviour accordingly."

Amit Dar, director of Global Education at the World Bank, concurs. "Knowledge matters when hiring someone, but what I'm really looking for is a team player.

Communication also makes it into the top three for students (both 18-25 and 11-17-year-olds) and executives, while teachers place it fourth. However, while this reflects a general consensus on the importance of communication, it means different things to different people. Effective oral communication is a fundamental tool to function in both work and society more broadly, but some employers fear that equally vital written communication skills are being lost.

These skills may already feature in mainstream education to a certain extent. Among survey respondents aged 18 to 25, 70% report that problem solving has formed part of the education they have received to date, while 68% say the same of teamworking and 63% of communication. A majority of teachers also include these skills as part of their teaching.

The importance of communication raises the issue of language. On the surface, foreign-language skills do not rank highly overall on the list of key workplace skills, but they are the competency that executives cite most frequently as missing within their company (28%). Unfortunately, education systems do not seem able to fill this gap. Foreign-language skills are the area where teachers are the least self-assured, with just 16% of this group feeling very confident in teaching them.

Some skills which survey respondents cite as likely to be increasingly important in the future are given a surprisingly low priority as key skills for today. Digital literacy, entrepreneurship and creativity are among the lowest-ranked essential skills among all business executives, teachers and students. Does this imply that they may not be as integral as they are often thought to be, or rather that they are considered so fundamental that they do not provide any useful distinction between potential employees?

Only entrepreneurship and foreign languages rank lower, suggesting that digital skills, like languages, may still be seen as the responsibility of subject specialists rather than being incorporated more broadly into the curriculum.

Increasingly, a lack of digital literacy seems likely to hold people back in the workplace, although just 17% of students aged 18 to 25 believe they would need to have digital literacy to be successful in the labour market.

"ICT skills are no longer an option; they're basic skills for operating in society," says Brett O'Riley, chief executive of Auckland Tourism, Events and Economic Development. "In New Zealand parents still think that ICT in the classroom refers to kids training for the ICT sector. We do have a shortage of ICT professionals, but ICT skills are needed for any job."

According to Sherry Tross, executive secretary of the Organisation of American States (OAS), digital literacy now forms a fourth strand alongside traditional foundational skills. "Digital literacy has become a fourth literacy added to reading, writing and arithmetic. Like other forms of literacy, it helps in decoding information, solving problems and discovering meaning in words or data."

Whether or not employers, teachers or students cite it as such, it seems clear that digital literacy is an essential skill, though perhaps one with which today's students, as digital natives, are better equipped than their teachers.

Entrepreneurship, however, is more divisive. While education experts view it as a key skill, it is rarely listed as such by students or teachers, while employers may prefer not to hire staff who are looking to rock the boat.

, entrepreneurship can be crucial to those living a more hand-to-mouth existence.

Interestingly, Mexico, the UAE and India are the countries where most employers surveyed place an emphasis on entrepreneurial skills,

> "ICT skills are no longer an option; they're basic skills for operating in society."
>
> *Brett O'Riley, chief executive, Auckland Tourism, Events and Economic Development*

2 How are skills of the future best taught?

> “Education systems need to provide students with hands-on learning that mirrors real-world problems and work opportunities in an interdisciplinary way.”
>
> *Dr Helen Soulé, executive director, Partnership for 21st Century Skills*

According to experts interviewed for this report, 21st-century skills cannot be taught in isolation. In order to be effective, they must be integrated into every subject area, so that skills development becomes inseparable from the sharing of knowledge.

If you want to foster oral communication skills, for example, holding a debate in the context of history is more lively than in isolation.”

At the French-American School of Rhode Island (FASRI) in the US, the teaching of 21st-century skills is consciously intertwined with the fact that the school provides a dual-language education. It emphasises the importance of communication in both French and English across all disciplines, encouraging students to gain experience of public speaking, networking and writing. Critical thinking is taught through the literature of both cultures as well as through philosophy and history, while collaboration and teamwork are modelled by staff operating in a dual-language context.

a cross-curricular approach is key. At the heart of the framework are what P21 terms “the four Cs”—communication, collaboration, critical thinking and problem solving, and creativity and innovation.

“When students possess these skills alongside content knowledge, they are more likely to be successful in college, in the workplace and as citizens”, she says. “Education systems need to provide students with hands-on learning that mirrors real-world problems and work opportunities in an interdisciplinary way. These new types of skills cannot be taught in isolation but must instead be suffused throughout the curriculum.”

If this is to become a reality, it requires the upskilling of all teachers to enable them to effectively foster skills at the same time as teaching content. For some school systems, this would mean a complete reinterpretation of the role of a teacher.

The teacher’s role is now about teaching how to work effectively. Teachers need to develop these skills themselves, which means we need to change pedagogical training.”

However, as Professor Griffin points out, if skills can be developed regardless of the surrounding content, that gives schools a degree of freedom in how they choose to incorporate 21st-century skills training into their curriculums. “Students need to be able to analyse information, manage resources, assess the contribution of individuals to the group, and take responsibility for

particular tasks. But it doesn't matter whether students learn them in history or chemistry."

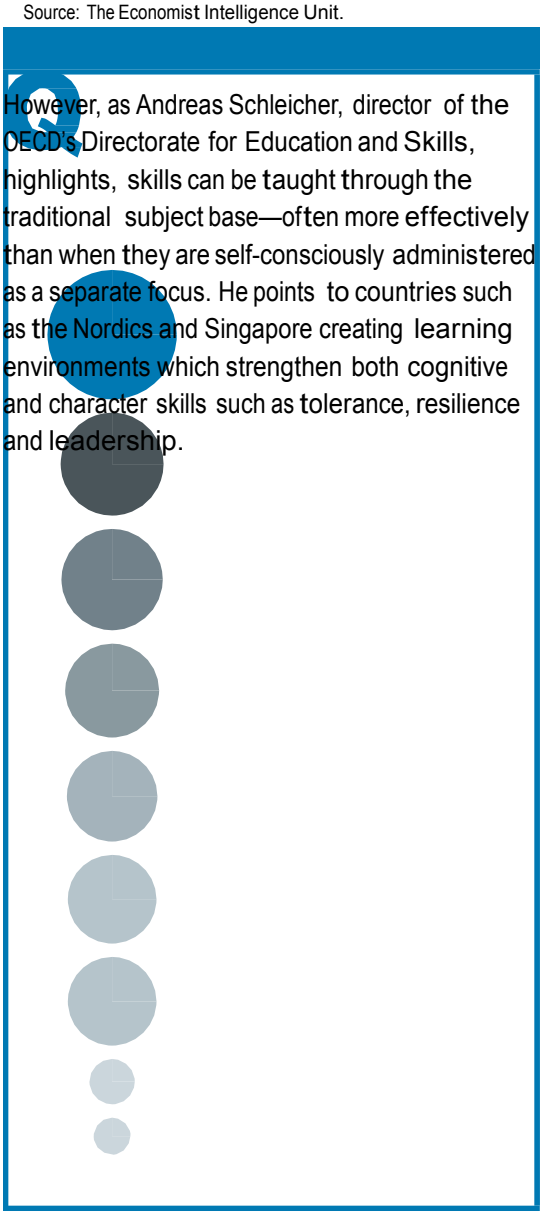
Education systems are slowly waking up to this idea.

School 21, a free school in Stratford, East London, was founded in 2012 to meet the needs of 21st-century learners aged 4-18. Oral communication is heavily emphasised as a vital skill, with "oracy" lessons teaching students to express themselves clearly and tailor their speech to their audience. Technology is integrated into the curriculum, from the use of iPads by students to critique each other's work to e-portfolios, blogging and making videos. The school encourages student leadership and responsibility wherever possible and includes one-on-one coaching for all students to support their individual learning.

In the US, Two Rivers Public Charter School in Washington, DC takes an interdisciplinary approach to skills development by embracing projects.

The greatest barrier to incorporating skills training more broadly into mainstream education appears to be the rigidity of existing curriculums: 49% of teachers find that the curriculum is too rigid to allow time for wider skills to be fostered.

Source: The Economist Intelligence Unit.



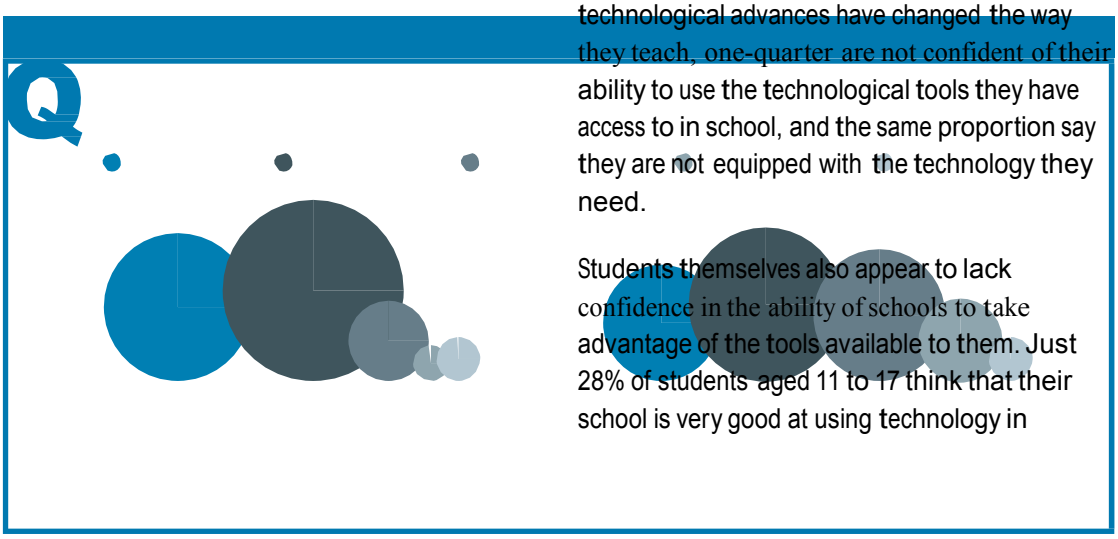
However, as Andreas Schleicher, director of the OECD's Directorate for Education and Skills, highlights, skills can be taught through the traditional subject base—often more effectively than when they are self-consciously administered as a separate focus. He points to countries such as the Nordics and Singapore creating learning environments which strengthen both cognitive and character skills such as tolerance, resilience and leadership.

. "Young people respond positively to adults who are creative and model the kinds of skills that they want to develop in their students," explains Gwyn Wansbrough, managing director at PYE. "

> "Young people respond positively to adults who are creative and model the kinds of skills that they want to develop in their students."
>
> *Gwyn Wansbrough, managing director, Partners for Youth Empowerment*

Technology has a central role to play in skills development. However, education rather than being at the forefront of technological change seems to be struggling to keep up, both with the pace of advances and with students. Even in primary schools, fully half of teachers feel that their students have a better understanding of the technology in their classroom than they do, a proportion which rises to 58% when the responses of secondary teachers are factored in.

Although just over half (51%) of teachers say that technological advances have changed the way they teach, one-quarter are not confident of their ability to use the technological tools they have access to in school, and the same proportion say they are not equipped with the technology they need.



Students themselves also appear to lack confidence in the ability of schools to take advantage of the tools available to them. Just 28% of students aged 11 to 17 think that their school is very good at using technology in

To what extent, if at all, do you agree or disagree with the following statements?
(% of respondents)

Strongly agree | Somewhat agree | Somewhat disagree | Strongly disagree | Don't know

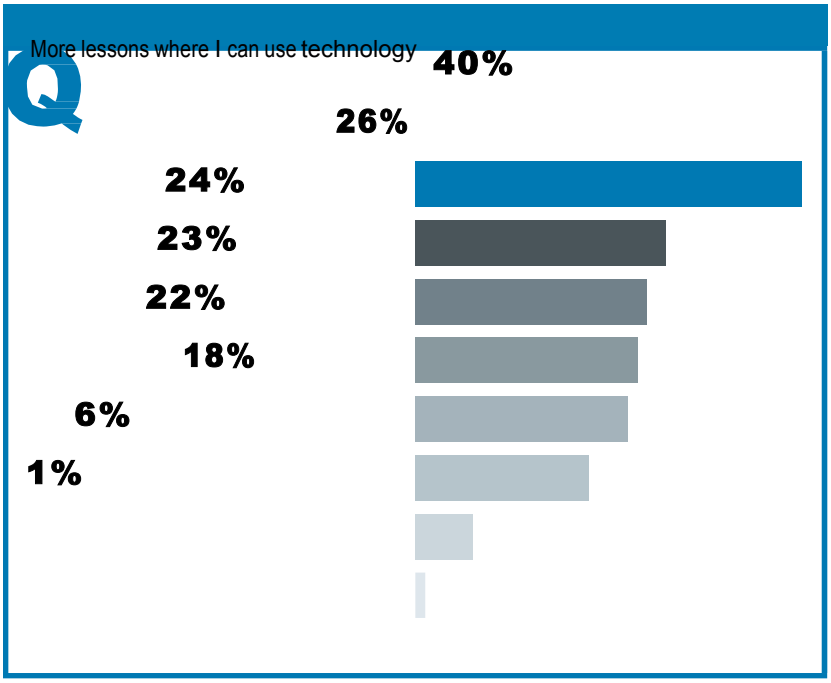
Technological advances (eg the explosion of mobile devices and social media) have changed the way I teach	2%	3%			
Students in my classroom often have a more advanced understanding of technology than I do					3%

Source: The Economist Intelligence Unit.

lessons.

It comes as no surprise that students born into a world of social media and mobile devices are more at home in it than their seniors

What changes, if any, would you most like to see in your school?
(% of respondents)



Source: The Economist Intelligence Unit.

This sense that schools may be missing a trick in failing to make full use of the technologies to which students dedicate their leisure time is echoed by other experts.

"Young people have an innate affinity with technology, and it would be a shame not to utilise that effectively," says Mr Schreuder. "South Africa has a far greater gap between the educational outcomes of rich and poor students than elsewhere in the world, and if we do nothing, technology will exacerbate that. But if you provide technological access to poorer kids and point them in the right direction, it enables individual learning, networking and collaboration."

Part of the value of technology is that it can respond to the strengths and weaknesses of a given student in a way that a teacher with a class of 50 would struggle to recreate. Similarly, it can allow far greater numbers of students to be actively and simultaneously engaged than would otherwise be the case. Schools in Singapore regularly encourage students to submit questions during class via instant messaging software, allowing the teacher to see what students are thinking about, even without the time to call on them all. However, this is far from being the norm elsewhere.

"Technology has been absorbed into a great deal of industries, but education has been much slower to change—classrooms often look as they did 100 years ago," says Ms Vegas of the Inter-American Development Bank. "It's a reality that kids have access to mobile devices and social media, but the way teachers respond is consistent

with the way education has stayed behind the times—there's a tendency to ban them."

Mr Zhao of the University of Oregon sees the growth of technology as part of a democratisation of information, but cautions that it is not sufficient on its own. "Teachers have historically monopolised classrooms in terms of information. But if we think the Internet means we don't need teachers we're wrong—we need someone to take care of the human aspect."

3 Are schools failing to equip students for the world of work?

Internationally, employers appear to be struggling to find young people with the skills they need. Over half (51%) of executives surveyed say a skills gap is hampering their organisation's performance, and only 34% claim to be satisfied with the level of attainment of young people entering the company. A 2014 report by McKinsey, *Education to Employment: Getting Europe's Youth into Work*, found that this gap could have a significant impact on firms' performance, ultimately affecting the wider economy: 27% of employers surveyed for the report said they had left entry-level jobs unfilled because of a lack of applicants with the required skills.

Students also appear to lack confidence in the relevance of their education: just 44% of students aged 18 to 25 believe that their education system is providing the skills they need to enter their country's workforce.

The nature of the gap, however, is ambiguous. In some sectors or countries it simply reflects the fact that too few students are choosing to train for the industries which most need them.

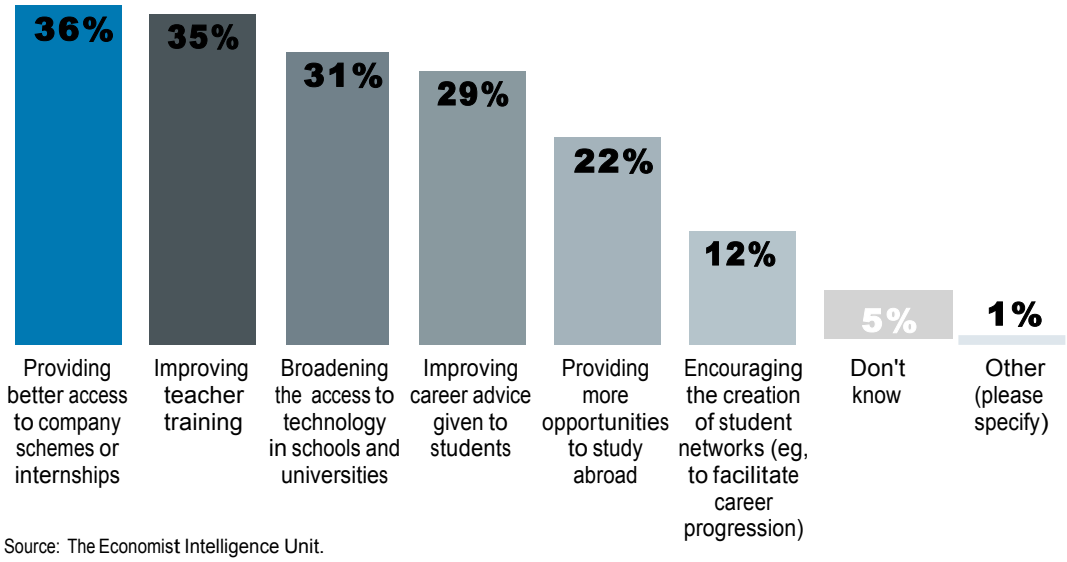
But even when students are purportedly studying a subject suitable for a career in a particular field, there appears to be a mismatch between what they are taught and what employers require.

"There is a disconnect between the demand-side and the supply-side of skills," notes Mmantsetsa Marope, director of the International Bureau of Education at the United Nations Educational, Scientific and Cultural Organisation (UNESCO). "Education systems, or should I say educators, hardly ever talk to businesses, to employers, to parents, to a whole range of stakeholders who are on the demand-side of the competencies which they are supposed to facilitate learners to acquire."

Over half (51%) of executives surveyed say a skills gap is hampering their organisation's performance.

Chart 6 (business survey)

Which of the following changes to your country's education system, if any, do you think would benefit your business?
Select up to two
(% of respondents)



Source: The Economist Intelligence Unit.

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According to the business survey, employers feel they should play a more active role in deciding what students are taught and that their position as stakeholders should be more explicit. Nearly three-fifths (57%) of executives think business does not have enough say in setting the curriculum in their country, while 36% identify improved access to company schemes and internships as the educational change that would most benefit their business.

While employers may be willing to top up the knowledge and training of bright recruits, it is soft skills whose absence leads to greater problems.

"CEOs argue that young people don't seem to have social graces and interpersonal skills such as respect, as well as the ability to work on their own without having someone looking over their shoulder all the time," says Mr Schreuder. "

Ms Vegas agrees. "In Latin America, socio-emotional skills are a big part of the gap between what employers need and what young people have. For example, tourism companies need people who will smile and be polite to guests, and often graduates just don't possess those public-facing techniques."

4 Are 21st-century skills an elite concern?

While it's easy to find support for the idea that 21st-century skills are at the centre of what a contemporary education system ought to be providing, they are not universally seen as a high priority. For many students currently in education, literacy and numeracy are a greater concern.

"One key challenge that we're seeing in developing countries is the lack of basic foundational skills such as literacy and numeracy," says Mr Dar. "Many students are coming out of education without them and are entering the labour market underequipped. If you lack them at an early stage, it's very difficult to catch up later."

The OECD's Mr Schleicher is similarly cautious about placing too heavy an emphasis on 21st-century skills. "The 21st-century skills agenda is a double-edged sword. It can lead to the temptation to keep adding things to the curriculum, resulting in a curriculum which is mile-wide but inch-deep."

Are skills such as problem-solving, creativity, communication and team working a luxury add-on that a country can only afford to consider once it has mastered the basics? According to Ms Vegas, the need to improve levels of basic skills does not exempt a country from the need to also foster soft or non-cognitive skills in its students.

"In Latin America, there is still a tremendous need to get kids out of school with competencies in reading and maths, which many aren't achieving," she says. "But on top of that there is a need for social skills, which historically families have been left to provide. In the past you'd train for a specific and secure job, but the jobs people do today may not exist in three years. What is key now is how quickly you can adapt to changes in education and the job market, and how you access information."

"Teachers need to understand that these are not taught skills but modelled skills," explains Mr Schreuder. "You can't just add them to the curriculum and hope students will learn them, without systemic planning. It needs to be entrenched and specified upfront as a goal of education."

> "Teachers need to understand that 21st century skills are not taught but modelled."
>
> *Brian Schreuder, deputy director-general, Curriculum and Assessment Management, Western Cape Education Department*

Conclusion

While it may be true that information can be accessed at the touch of a fingertip and that "teachers are no longer the oracle", as UNESCO's Dr Marope puts it, it does not necessarily follow that the sharing of knowledge no longer has a crucial role to play. A teacher's input in filtering, sharing and explaining content is as critical today as it has ever been.

What has changed, however, is the expectation that the knowledge which is considered important today is the same knowledge that will be needed tomorrow. A recognition of the pace of change, both in the workplace and in society more broadly, pervades the responses to this report's surveys and interviews. Education must therefore concern itself more than ever with the development of skills to interrogate knowledge, to find it for oneself, and to respond to rapidly changing situations.

The traditional classroom, with a teacher at the front and the students in serried ranks, has had its day, as has rote learning as the core of education. Instead, interviewees are unanimous in emphasising the importance of group discussion, giving students the opportunity to work things out for themselves, while also learning how to respond to the differing skills and opinions of their peers. Effective collaboration, crucial in almost every sector, is a difficult habit to acquire as an adult.

This style of learning places new demands on teachers, who may themselves not be universally equipped with the competencies to lead a more fluid, interactive class. It also requires governments to be willing to rethink their approach to teacher training and professional development. It is no longer sufficient—if it ever was—that teachers are well versed in their subject. They must recognise that the skills a student acquires through learning are as important, if not more so, than the content, and be able to incorporate opportunities for the development of problem solving, collaborative, creative and communication skills into their teaching. These skills cannot be taught in isolation but must be present across the curriculum, embedded in the fabric of how teachers teach.

Technology has a valuable role to play and offers opportunities to level the playing field, giving students access to tools and teaching from around the world and broadening their horizons. However, this can only happen by deliberate and careful design, by providing access to technological support to those who need it most. Unchannelled, technology has the potential to simply deepen inequity by offering ever greater opportunities for advancement to those who can afford to take advantage of it.

It is impossible to say what challenges will confront today's students, or what the workplace of the future will look like. Ensuring that they leave school with the habit of learning well established will, as Ms Tross of the OAS puts it, "prepare students for a world not yet known".

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