Enhancing Higher Education System Performance

Benchmarking higher education system performance: Conceptual framework and data
CHAPTER 2. THE PERFORMANCE OF HIGHER EDUCATION SYSTEMS

But there are questions about how well higher education systems are performing
The costs of higher education are becoming increasingly difficult to manage
Students and families are increasingly being asked to share the cost of higher education
The debate on grants and loans continues
There are questions about how well higher education is contributing to human capital formation
We don’t have a lot of information on the learning outcomes of higher education
But graduate skills levels appear to be mixed
Too many unprepared students may be entering higher education
There is a cost to society from low skilled higher education graduates
And higher education remains out of the reach of many
Higher education could do more in terms of continuing education and life-long learning
Some countries are not fully exploring the benefits of internationalisation
It is sometimes difficult for students to assess the quality of cross-border higher education
There are questions about well higher education is contributing to innovation
Higher education still plays a minor role in innovation
Most doctorate holders are employed in government-dependent sectors
Incentives for academic staff hinder the broader societal impact of research
Successful research is becoming increasingly specialised but countries often fail to act accordingly
Some countries fail to reap the benefits of international collaboration
Despite progress in open access, the results of publicly-funded research are often not publicly available
There is a problem with gender equity in research
There are questions about how well higher education is contributing to social, cultural and environmental development

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NOTE BY THE SECRETARIAT

1. This document presents the report Benchmarking Higher Education System Performance: Conceptual Framework and Data (the benchmarking report). The benchmarking report will guide the higher education system performance benchmarking exercise 2017-18. The exercise is part of the OECD Enhancing Higher Education System Performance project being developed by the Higher Education Team, Skills beyond Schools Division, Directorate for Education and Skills. The report has benefited from discussion and advice from the Informal Working Group on Higher Education (IWG).

2. The report presents an account of higher education today, the debate around the performance of higher education regarding its contribution to economic, social, cultural and environmental development, and the conceptual framework for the benchmarking higher education system performance project, including its data architecture, and the benchmarking data to be used.
CHAPTER 1. HIGHER EDUCATION TODAY

The role of higher education is becoming more important

3. Productivity and economic growth is driven by innovation which relies on research and human capital. Higher education significantly contributes to the development of both of them. Higher education also contributes to social cohesion (the willingness of members of a society to cooperate with each other in order to survive and prosper) through its contribution to the social, cultural and environmental development of societies.

Higher education’s contribution to human capital formation

4. Higher education develops the advanced skills needed for modern economies, by developing technical, professional and discipline-specific knowledge and skills; cognitive and information processing skills; and social and emotional skills in graduates that prepares them for active citizenship and the world of work.

5. The financial crisis and longer-term trends, such as automation, ageing, and the rise of the service and knowledge economy, are changing the demand for jobs. Gains in employment are mostly in non-routine jobs, those more associated with higher education.

6. Higher education can collaborate with industry, government and third sector organisations to enable workers to cope with change and help businesses and other organisations improve productivity.

Higher education’s contribution to innovation

7. Higher education trains graduates up to doctoral level. Countries with a higher percentage of doctorate holders in the population tend to exhibit higher rates or R&D intensity and innovation.

8. The collaboration of students and academics with organisations outside of academia contribute to knowledge and technology transfer that foster product and process innovation. The international mobility of highly skilled individuals, students and academics, foster international collaboration, which is also strongly associated with research excellence.

Higher education’s contribution to social, cultural and environmental development

9. Higher education plays an important role not only as a source of product and/or process innovation but also in helping to find innovative solutions and adaptation to big societal challenges such as environmental degradation, climate change, ageing societies, obesity epidemic, mass migration, extremism, conflict, etc.

10. As such all fields of study and science in higher education, from science, technology, engineering and mathematics (STEM) to social sciences, humanities and arts, are important for societal development.
As a result higher education is rapidly expanding

11. The expansion in tertiary attainment over the generations has been significant. According to (UNESCO, 2016), student numbers more than doubled between 1999 and 2014, from around 95 to 207 million in the world. The number of young people aged 25-34 with a tertiary qualification increased by nearly 45% between 2005 and 2013 in OECD and G20 countries and is expected to keep increasing in the coming decade. By 2020, the number of 25-34 year olds with a tertiary qualification in OECD and G20 countries is expected to grow from 137 million to 300 million (Figure 1) (OECD, 2015b).

12. Based on current patterns of graduation, more than half of young adults in OECD countries are expected to enter a bachelor’s degree, and almost a quarter are expected to enter a master’s degree or equivalent programme over their lifetime.

13. Higher education has grown quickly from an elite to a mass system, as the figures from Education at a Glance testify (OECD, 2016). In all OECD and partner countries, except Israel, the share of younger adults (25-34 year-olds) with tertiary qualifications is larger than that of older adults (55-64 year-olds) with that level of qualification. On average, the difference between the generations in tertiary attainment is about 16 percentage points.

14. Based on current patterns of graduation, an average of 36% of today’s young people across OECD countries is expected to graduate from tertiary education at least once before the age of 30. Over their lifetime, 38% are expected to graduate with a bachelor’s degree, 18% are expected to complete a master’s degree, and roughly 2% are expected to graduate from a doctoral programme.
On average across OECD countries, 54% of new entrants into tertiary education are women, and 18% are over the age of 25. In addition, some 13% of all entrants are international students.

Higher education is becoming increasingly global

In 2013, more than 4 million students were enrolled in tertiary education outside their country of citizenship. The number of international students grew from 0.8 million in 1975 to 4.5 million in 2012 (OECD, 2015a). The number of mobile students in the OECD countries grew by 5% between 2013 and 2014 (OECD, 2016). Students from Asia represent more than half (53%) of international students enrolled worldwide.

The exploding demand for tertiary education worldwide and the recognised value of studying abroad have contributed to an increasing and diversified flow of international students, ranging from those who cannot find a place to study in post-secondary education at home to students of high academic achievement studying at high-quality programmes and institutions. In addition, the educational value associated with a diverse student body, the substantial revenues that can be earned by expanding education for international students, and economic and political considerations prompted some governments and institutions to make major efforts to attract students from outside their national borders (Altbach and Knight, 2007; Knight, 2008).

The proportion of international students among total enrolments tends to be much larger at the most advanced levels of tertiary education. Within OECD countries, 27% of students enrolled in doctoral or equivalent programmes and 12% of those enrolled in master’s or equivalent programmes are international students, against an average of 6% in all levels of tertiary education (Figure 2).
Figure 2. Student mobility in tertiary education, by ISCED level (2014)

International or foreign student enrolments as a percentage of total tertiary education

2. Foreign students are defined on the basis of their country of citizenship. These data are not comparable with data on international students and are therefore presented separately in the figure.
3. International students at the bachelor’s or equivalent level are included in the master’s or equivalent level.

Countries are ranked in descending order of the percentage of international or foreign students in tertiary education.


19. The language spoken and used in learning and teaching is likely to affect international students’ choices over their potential destination countries. The prevalence of predominantly English-speaking destinations, such as Australia, Canada, New Zealand, the United Kingdom and the United States, in part reflects the progressive adoption of English as a global language. English-taught higher education programmes are offered in an increasing number of institutions in non-English speaking countries (Figure 3. The diffusion of English as a medium of instruction is especially noticeable in the Nordic countries (Box C4.1 in OECD, 2015a).
Countries are ranked in descending order of the percentage of tertiary education institutions offering ETPs at ISCED level 5 or 6. 

StatLink http://dx.doi.org/10.1787/888933284288

20. Countries that charge international students the full cost of education reap significant economic benefits. Several countries in the Asia-Pacific region have actually made international education an explicit part of their socio-economic development strategy and have initiated policies to attract international students on a revenue-generating or at least a cost-recovery basis. Tuition fees do not necessarily discourage prospective international students, as long as the quality of education provided is high and its potential returns make the investment worthwhile.

21. In recent years, several OECD countries have eased their immigration policies to encourage the temporary or permanent immigration of international students.

22. The decision if and where to study abroad is often a complex one. Students base it on a number of factors such as recognition of foreign degrees and work carried out abroad, government policies to facilitate the transfer of credits between home and host institutions; the quality and admission policies of tertiary education in the home country; future opportunities to come back to work in the home country; and cultural aspirations. In addition, geographical, trade or migration links between countries can play a large role.

23. Internationalisation is not just about the international students, but also about changes that are happening to the curriculum that reflect an international and intercultural dimension of the learning and teaching process. These changes also affect domestic students.
Domestic students also have the opportunity to participate in the internationalisation of higher education as exchange students who spend part of their studies abroad. This is also the case with academic staff, who increasingly spend periods abroad to work with colleagues in other countries. The mobility of staff and students denotes an increase in collaboration in both education and research.

Another important phenomenon in internationalisation is the growth in cross-border higher education, where students enrol in a foreign higher education institution or programme in their home country.

The number of higher education institutions is growing and the sector is becoming more diverse

The number of higher education institutions has been growing to accommodate the expansion of student numbers, and there are over 18,000 higher education institutions that offer at least a post-graduate degree or a four-year professional diploma in 180 countries (International Association of Universities and UNESCO Information Centre on Higher Education, 2016). Higher education institutions are also becoming more diverse: specialising in different levels of education, from short-cycle tertiary education to doctoral programmes; from traditionally academic-oriented to more professional programmes (including professional doctorates); from very subject-specialised to comprehensive institutions; from state, state-supported, private non-profit, to private for-profit institutions; and from open access to very selective institutions.

These trends reflect the benefits of higher education

There are large incentives for individuals to obtain higher education qualifications

There are large incentives for people to attend higher education. Educational attainment has a strong positive relationship to skill proficiency. Adults with tertiary-level qualifications have more advanced knowledge and skills than non-graduates. This is expected, as adults who have completed higher education will have spent longer in education and received higher levels of instruction than their less-qualified peers.

In addition, completing higher levels of education often provides access to jobs that involve higher levels of further learning and information-processing tasks. People with higher levels of education are more likely to be employed, and remain employed, and have more opportunities to gain experience on the job. Also, higher educational attainment is associated with higher earnings during a person’s working life.

Higher education graduates have better labour market outcomes on average

Across OECD countries, tertiary-educated adults have the best outcomes in the labour market. On average, across OECD countries, the employment rate of tertiary-educated adults is 84%, compared to 74% for adults with upper secondary or postsecondary non-tertiary education as their highest level of attainment. Among adults without upper secondary education, the employment rate is only 56% (OECD, 2016).

Across all countries for which data is available, having a tertiary education reduces the risks of being unemployed (Figure 4). On average, 4.9% of adults with tertiary education are unemployed compared with 8.3% of adults with upper secondary or post-secondary non-tertiary education, and 12.4% of adults with below upper secondary education.
1. Year of reference differs from 2015. Refer to the source table for more details.
2. Data for tertiary education include upper secondary and post-secondary non-tertiary programmes (less than 5% of the adults are under this group).

Countries are ranked in descending order of the unemployment rate of adults with below upper secondary education.


31. In general, the higher the level of educational attainment is, the higher the employment rate and the lower the unemployment rate are. This holds true for the various levels within tertiary education, as well. The employment rate for adults with a short-cycle tertiary qualification is 80%, on average across OECD countries, and it rises to 82% for those with a bachelor’s or equivalent degree, 87% with a master’s or equivalent degree, and 91% with a doctoral or equivalent degree.

32. Most of the current and likely future job creation will be in occupations that require some form of tertiary education, which represents another powerful incentive to pursue tertiary education.

They generally earn more than non-higher education graduates

33. In all OECD countries, adults with tertiary education earn more than adults with upper secondary education who, in turn, earn more than adults with below upper secondary education. Since private investment costs beyond upper secondary education rise considerably in most countries, a high earnings advantage is an important incentive for individuals to invest time and money in further education.
Figure 5. Relative earnings of adults working full time, by educational attainment (2014)

25-64 year-olds with income from employment; upper secondary education = 100

- Index 100 refers to the combined ISCED levels 3 and 4 of the educational attainment levels in the ISCED 2011 or ISCED-97 classification.
- Earnings net of income tax.
- Data for upper secondary attainment include completion of a sufficient volume and standard of programmes that would be classified individually as completion of intermediate upper secondary programmes (18% of the adults are under this group).
- Data refer to all earners.
- Countries are ranked in ascending order of the relative earnings of 25-64 year-olds with tertiary education.

Note: Tertiary education includes short-cycle tertiary, bachelor’s, master’s, doctoral or equivalent degrees.
1. Year of reference differs from 2014. Refer to Table A6.1 for details.
2. Some levels of education are included with others. Refer to “x” code in Table A6.1 for details.
3. Index 100 refers to the combined ISCED levels 3 and 4 of the educational attainment levels in the ISCED 2011 or ISCED-97 classification.
4. Earnings net of income tax.
5. Data for upper secondary attainment include completion of a sufficient volume and standard of programmes that would be classified individually as completion of intermediate upper secondary programmes (18% of the adults are under this group).
6. Data refer to all earners.


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34. Earnings differentials between adults with tertiary education and those with upper secondary education are generally more pronounced than the differentials between upper secondary and below upper secondary education. On average, adults with a master’s, doctoral or equivalent degree earn almost twice as those with upper secondary education across OECD countries, and those with a bachelor’s or equivalent degree earn 48% more, while those with a short-cycle tertiary degree earn only about 20% more (Figure 5).

35. About 25% of tertiary-educated individuals earn more than twice the median, compared to 8% of those with upper secondary or post-secondary non-tertiary education.
36. The earnings advantages are largest in countries with a small share of tertiary-educated people, such as Brazil, Chile, Colombia, Hungary and Mexico, whereas earnings advantages are smallest in countries with a large share of tertiary-educated people, such as Sweden, Denmark, and Norway.

_Individuals generally gain significant private returns on their investment in higher education_

37. On average across OECD countries, the financial return to tertiary education is substantial (Figure 6). The calculated financial return to tertiary education for a single worker with no children is around twice as large as the returns to such a person with upper secondary or post-secondary non-tertiary education as his or her highest level of attainment.

**Figure 6. Private net financial returns on attaining tertiary education, by gender (2012)**

As compared with adults attaining upper secondary or post-secondary non-tertiary education, in equivalent USD converted using PPPs for GDP

1. Year of reference differs from 2012, please see Tables A7.3a and A7.3b for further details.

Countries are ranked in ascending order of private net financial returns for a man.


StatLink  
[http://dx.doi.org/10.1787/888933397317](http://dx.doi.org/10.1787/888933397317)

38. On average, across OECD countries, the private net financial returns for a man attaining tertiary education are about USD 258,400 over his career, compared to a man with upper secondary or post-secondary non-tertiary education. The equivalent for a woman is only about USD 167,600.
Governments and individuals are spending more on higher education

39. The expansion of higher education translates necessarily in substantive investment in this level of education. However, there is a large variation in spending in different countries, and the relationship between countries’ relative wealth and their expenditure levels varies as well. Nonetheless, expenditure on tertiary education amounts to at least 1% of GDP in nearly all countries (Figure 7).

Figure 7. Public and private expenditure on tertiary education institutions, as a percentage of GDP

From public\(^1\) and private\(^2\) sources, and source of funds

<table>
<thead>
<tr>
<th>Country</th>
<th>% of GDP</th>
<th>Public expenditure on education institutions</th>
<th>Private expenditure on education institutions</th>
</tr>
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<tbody>
<tr>
<td>United States</td>
<td>2.5</td>
<td></td>
<td></td>
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<tr>
<td>Costa Rica</td>
<td>2.3</td>
<td></td>
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<tr>
<td>Chile</td>
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<tr>
<td>Colombia</td>
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<td>Estonia</td>
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<td>Germany</td>
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<td>France</td>
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<td>Greece</td>
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<td>Ireland</td>
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<td>Italy</td>
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<td>Luxembourg</td>
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<td>Norway</td>
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<td>Portugal</td>
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<td>Spain</td>
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<td>Sweden</td>
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<tr>
<td>Switzerland</td>
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</tbody>
</table>

1. Including public subsidies to households attributable to educational institutions, and direct expenditure on educational institutions from international sources.
2. Net of public subsidies attributable for educational institutions.
3. Public does not include international sources.

Countries are ranked in descending order of expenditure from both public and private sources on educational institutions.

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40. On average, OECD countries spend around two-thirds more per student at the tertiary level than at the primary, secondary and post-secondary non-tertiary levels. R&D activities or ancillary services can account for a significant proportion of expenditure at the tertiary level (an average of 32% of total expenditure per student). However, when these are excluded, expenditure per student on core educational services at the tertiary level is still, on average, 21% higher than at the primary, secondary and post-secondary non-tertiary levels (OECD, 2015a).
At the tertiary level, spending per student increased between 2000 and 2013 in most countries. However, since the beginning of the economic crisis in 2008, expenditure on tertiary institutions has decreased in 6 of the 29 countries with available data. This led to a drop in expenditure per student in some of these countries, but not in Slovenia and Italy where tertiary enrolment fell even faster (Figure 8). Expenditure per student also fell in some countries, where the increase in the number of students was faster than the corresponding increase in expenditure (Norway, Belgium, USA, Mexico, Germany, Denmark).

Figure 8. Changes in the number of students, expenditure on educational institutions and expenditure per student in tertiary education (2008, 2013)

Index of change between 2008 and 2013 (2008 = 100, 2013 constant prices)

1. Public expenditure only.
2. Public institutions only.
3. Some levels of education are included with others. Refer to "x" code in Table B1.1 for details.

Countries are ranked in descending order of change in expenditure per student by educational institutions.

Source: OECD. Table B1.5b. See Annex 3 for notes (www.oecd.org/education/education-at-a-glance-19991487.htm).

http://dx.doi.org/10.1787/888933397633

There are large incentives for society to invest in higher education

Higher education produces graduates with the knowledge and skills needed for professions and advanced occupations for the post-industrial, knowledge society. Higher education research drives advanced knowledge and innovation. Graduates tend to be more engaged citizens and thus contribute to social cohesion. In addition, higher education also produces significant financial returns to individuals.
Countries generally gain significant public returns on their higher education

43. Not only does education pay off for individuals, but the public benefits of education, in greater tax revenues and social contributions from a larger proportion of tertiary-educated adults, also outweigh the cost (Figure 9).

44. Across OECD countries, the net public return on investment for a woman with tertiary education is USD 74,100 over her lifetime – almost 1.4 times the public cost of investment in her education. For a man, the net public return is over USD 143,700, which is almost 2.7 times the public cost of investment in his education.

45. Both private and public returns to tertiary education are higher than returns to upper secondary and post-secondary non-tertiary education.

Figure 9. Public costs and benefits of education on attaining tertiary education, by gender (2012)

In equivalent USD converted using PPPs for GDP

1. Year of reference differs from 2012, please see Tables A7.4a and A7.4b for further details.

Countries are ranked in ascending order of public net financial returns for a man.


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The benefits are not only financial

Higher education also produces significant social returns

46. The benefits of education are not only financial. Graduates are more likely to report desirable social outcomes, including good health, participation in volunteer activities, that they trust others, and that they feel they have a say in government (Figure 10). In other words, more highly educated adults tend to be more engaged in the world around them (OECD, 2015a).

Figure 10. Social outcomes related to education (2012)

Survey of Adult Skills, average, 25-64 year-olds, upper secondary or post-secondary non-tertiary education as reference category

Note: Calculations are based on a linear regression after accounting for gender, age and monthly earnings.
Social outcomes are ranked in descending order of percentage-point difference between upper secondary or post-secondary non-tertiary and tertiary education.
Source: OECD. Tables A8.1, A8.2, A8.3a, A8.4, and Tables A8.1 (L), A8.1 (N), A8.2 (L), A8.2 (N), A8.3a (L), A8.3a (N), A8.4 (L) and A8.4 (N), available on line. See annex 3 for notes (www.oecd.org/education/education-at-a-glance-19991487.htm).

47. Individuals thus have incentives to pursue higher education, and governments have incentives to provide appropriate infrastructure and organisation to support the expansion of higher education attainment across the population. Consequently, over the past decades, almost all OECD countries have seen significant increases in the higher educational attainment of their populations.
Communities also value higher education...

48. Higher education produces economic, social, cultural and environmental impact in the community, be it at the local, regional, national or global level (OECD, 2007, 2013).

… for continuing education

49. Students can move in and out of higher education throughout their lives in order to gain new skills and qualifications.

50. Higher education also provides non-degree awarding courses that offer all a learning opportunity throughout life to improve knowledge, skills and competences for personal, civic, social and/ or employment reasons.

51. These courses can complement previous education or be a stepping-stone to further higher education study.

… for technology transfer and innovation

52. The transfer of research conducted at higher education institutions into the community can lead to social and economic benefits.

53. There are hard benefits that can be measured quantitatively, such as the commercialisation of knowledge (i.e. licensing payments, royalty fees, etc.) or social innovations:

- licensing of higher education patents to companies
- formation of start-up and spin-off companies
- non-patent and software innovations in public domain - creative commons and social innovation

54. There are also some intangible benefits that relate to formal infrastructures as well as informal links between individuals that results from collaboration:

- problem solving cooperation in R&D
- public spaces - sharing of space/ facilities/ equipment/ services/ networking
- people mobility and education between higher education and external organisations

… for social engagement

55. Higher education also has an impact through social engagement processes, where universities form partnerships with public and private sector organisations to engage citizens, strengthen democracy and citizenship, address societal challenges, and generally contribute to the public good (see Box 1).
Box 1. Higher education social engagement

Higher education social engagement involves a partnership of higher education knowledge and resources with those of the public and private sectors to enrich scholarship, research and creative activity, such as:

- Volunteering of staff and students in social organisations
  - fundraising
  - service in organisations and community groups
  - charity events
  - schools support
  - disaster relief
  - development aid
- Expert advisory engagement
  - public speeches
  - advisory committees
  - media interventions
  - consultancy
- Services and facilities to the community
  - improving public health, education, employment, arts and culture
  - job creation
  - provision of physical facilities (libraries, labs, sport facilities)
  - access and provision of cultural activities (theatres, museums)
  - brokerage/facilitation of meetings/reports between stakeholders (e.g. bringing together community groups and public authorities)
- Educational outreach/collaboration and widening participation activities
  - empowerment of disadvantaged groups (e.g. socio-economically disadvantaged population, senior population, ethnic minorities, people with disabilities, mature students)
  - tutoring and mentoring of school pupils
  - community-based learning and research
  - promotion of educational achievement and access to higher education for disadvantaged groups


... for regional development

56. Higher education institutions can support the specific needs and circumstances of regional economic, social and cultural development.

57. Higher education makes considerable direct economic contribution to the local and regional economy. Higher education institutions are employers and customers as well as suppliers of goods and services. Their staff and student expenditure have a direct effect on income and employment in the cities and regions. Higher education institutions can also widen the tax base. At the same time, they are consumers of local government services and local firms’ products.

58. Higher education institutions can link with regional partners (public and private) to develop local industries. They contribute to a region’s comparative advantage in knowledge-based industries and to its human capital base, as they train professionals who may be more likely to remain in the regions on graduation.
59. They also provide lifelong learning opportunities for local residents, and they can provide content and the audience for local cultural programmes.

60. Finally, higher education institutions can also form partnerships with other local higher education institutions. Co-operation among higher education institutions can bring numerous advantages including critical mass in competing with other regions, improvement of pathways that involve enrolment at multiple institutions and the sharing of learning through the dissemination of best practice.

... for regional integration

61. Higher education can play an important role in regional integration - the process by which groups of countries liberalise trade, creating a common market for goods, people, capital and services as a means of achieving more prosperity, peace and security.

62. The development of the European Higher Education Area and the European Research Area are examples of how higher education can be a motor for regional integration. Other parts of the world have seen similar developments, such as ASEAN (Association of Southeast Asian Nations) and MERCOSUR (Mercado Común del Sur), albeit less established.

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CHAPTER 2. THE PERFORMANCE OF HIGHER EDUCATION SYSTEMS

But there are questions about how well higher education systems are performing

63. Questions are being raised about the performance of higher education and its contribution to our societies, through education, research and engagement (Brennan et al., 2014; European Commission, 2010; Stensaker and Harvey, 2011). Ultimately, there is increasing pressure to demonstrate that the significant public and private investment on higher education pays back, economically, socially, and culturally.

The costs of higher education are becoming increasingly difficult to manage

64. The expanding systems of higher education are placing a greater financial burden on governments and individuals. This has been made even more difficult by the 2008 economic crisis, which has added pressure to state budgets already strained by mounting health and pension commitments. As a result, governments are looking for new ways to finance higher education.

Students and families are increasingly being asked to share the cost of higher education

65. Many countries have similar goals for tertiary education, such as strengthening the knowledge economy, through increasing access for students and boosting completion rates. At the same time, they want to ensure the financial stability of their higher education systems. However, OECD countries differ dramatically in the way the cost of higher education is shared among governments, students and their families, and other private entities – and in the financial support they provide to students.

66. Education, at all levels, is mostly publicly funded, but the tertiary sector, in comparison to other educational sectors, obtains the largest proportion of funds from private sources, such as households and private enterprises: around 30% on average for OECD countries (Figure 11).

67. Given that an increasingly high number of students have access to higher education, both public and private expenditure have increased faster at tertiary level than at lower levels across the OECD. Yet, unlike in primary, secondary and post-secondary education, the increase was stronger in public sources (22%) than in private sources (15%). However, between 2005 and 2013, the average share of public funding for tertiary institutions remained stable at around 71% (OECD, 2016).
The fact that higher education is able to attract a significant share of private funding may make it better able to cope with austerity measures in terms of public funding in some countries, and ensure adequate funding levels in general. However, private funding of tertiary education comes mainly from households, raising concerns about equity of access to education. OECD countries differ significantly in the amount of tuition fees charged to students, but increasingly students are being asked to pay fees, or higher fees, in publicly funded institutions.

Some stakeholders are concerned that the balance between public and private funding may become so tilted as to discourage potential students from entering tertiary education. Some believe that countries should significantly increase public support to students, while others support efforts to increase the amount of funding to tertiary education provided by private enterprises.
70. Public funding for tertiary education increased between 2000 and 2012 in nearly all countries for which comparable data are available. However, more households are sharing the cost of education, thus private funding increased at an even greater rate in more than three-quarters of countries. This trend is mainly influenced by some European countries, where there were significant changes in tuition fees and where enterprises participate more actively in providing grants to finance tertiary institutions (OECD, 2015a).

71. High private returns to tertiary education suggest that a greater contribution to the costs of education by individuals and other private entities may be justified, as long as there are ways to ensure that funding is available to students regardless of their economic backgrounds.

72. Research seems to show no strong relationship between levels of tuition fees and participation in tertiary education (OECD, 2008b). However, among countries with high tuition fees, student financial support systems that offer loans with income-contingent repayment combined with means-tested grants...
may help to promote access and equity while sharing the costs of higher education between the state and students.

73. On the other hand, lower tuition fees can help promote student access and equity in higher education, particularly among disadvantaged populations, who may be particularly impacted by the upfront costs or are more susceptible to “sticker shock”. However, they may also constrain the ability of tertiary institutions to maintain an appropriate quality of education, especially in light of the massive expansion of tertiary education in all OECD countries in recent years. Moreover, budgetary pressures stemming from the global economic crisis may make it more difficult for countries that have lower tuition fees to sustain this model in the future.

74. In all OECD countries, people with a master’s, doctoral or equivalent degree have better labour market opportunities compared to those with only a bachelor’s degree. However, in one-third of OECD countries, tuition fees charged by public institutions for master’s and doctorate or equivalent programmes are not much higher than those charged for bachelor’s degree programmes.

75. An increasing number of OECD countries charge higher, sometimes significantly higher, tuition fees for international students than for national students, and many also differentiate tuition fees by field of education, largely because of the relevance of the different qualifications on the labour market.

76. Policy decisions relating to tuition fees affect both the cost of tertiary education to students and the resources available to tertiary institutions. Tuition fees paid by students and their families can play a significant role in funding tertiary education institutions and also affect decisions to enrol in tertiary programmes within the country or abroad. As such, policies relating to cost-sharing play an important role in the performance of higher education institutions.

The debate on grants and loans continues

77. Evidence suggests that having a robust financial support system is important for ensuring good outcomes for students in higher education, and that the type of aid is also critical (OECD, 2008b). A key question in many OECD countries is whether financial support for students in tertiary education should be provided primarily in the form of grants or loans. Governments support students’ living or educational costs through different combinations of these two types of support.

78. Advocates of student loans argue that loans allow available resources to be spread further. If the amount spent on grants were used to guarantee or subsidise loans instead, more aid would be available to more students, and overall access to higher education would increase.

79. However, given the dramatic expansion of higher education, one important question is whether some future graduates will realise enough returns to their education to be able to repay their loans.

There are questions about how well higher education is contributing to human capital formation

80. Improved skills narrow the labour market outcomes gap between individuals with different levels of formally recognised education, but do not close it completely (Lane and Conlon, 2016). Degrees and qualifications are signals that matter in the labour market.

81. In times of higher education massification, how reliable are those signals? Has the dramatic increase of higher education attainment in the recent past, along with investment in higher education, witnessed a commensurate increase in the skill levels of adults in our countries? In other words, has quality accompanied quantity?
We don't have a lot of information on the learning outcomes of higher education

82. For a long time it has been difficult to answer the question on how well higher education is contributing to human capital formation, as data on higher education graduate skill outcomes is virtually non-existent. By contrast, the school sector has had the OECD Programme for International Student Assessment (PISA) to evaluate education systems worldwide by testing the skills and knowledge of 15-year-old students, since 2000.

83. So far, there has not been a similar programme to systematically directly measure higher education student learning outcomes. This presents a problem: “Without data on learning outcomes, judgements about the quality of teaching and learning at higher education institutions will continue to be made on the basis of flawed rankings, derived not from outcomes, nor even outputs – but from idiosyncratic inputs and reputation surveys” (Schleicher, 2015).

84. However, there is growing interest in measuring how much students learn in higher education. Several countries are developing models to assess the learning outcomes and learning gain of higher education programmes and institutions. The OECD’s Assessment of Higher Education Learning Outcomes (AHELO) feasibility study demonstrated that a large-scale comparative assessment of higher education learning outcomes is conceptually valid and for the most part technically feasible (OECD, 2012, 2013a, 2013b). The project is not continuing, but there are similar ongoing projects (Barrie et al., 2012; Goff et al., 2015).

- The Higher Education Quality Council of Ontario (HEQCO) is conducting a pilot project to assess learning outcomes in higher education using the OECD's Education and Skills Online assessment tool. Participating colleges and universities will test incoming students on their literacy, numeracy and problem-solving skills, and give the same test to the graduates as they leave.
- Other countries have developed or used a range of instruments in relation to the assessment of learning outcomes in higher education. The Australian Learning and Teaching Council (ALTC) funded the Assessing and Assuring Graduate Learning Outcomes (AAGLO) project to gather evidence about the type of assessment tasks and assurance processes that provide convincing evidence of student achievement of and progress towards graduate learning outcomes. AAGLO was one of a number of projects and initiatives that reflect increasing international attention to the quality of student learning outcomes.
- The Higher Education Funding Council for England (HEFCE) is currently funding pilot projects to develop measures of learning gain in higher education.
- The USA has also expanded the use of standardised instruments such as the Collegiate Learning Assessment (CLA) to assess graduate achievement - the CLA+.
- In the context of the Bologna Process, the Tuning Project developed threshold-level learning outcomes and competences for disciples such as history, chemistry, nursing and business. This has been expanded with the Measuring and Comparing Achievements of Learning Outcomes in Higher Education in Europe (CALOHEE) project, which is looking at the feasibility of measuring and comparing achievements of learning outcomes in higher education in Europe.

But graduate skills levels appear to be mixed

85. The OECD Survey of Adult Skills, part of the Programme for the International Assessment of Adult Competencies (PIAAC), has been able to provide us with some insights recently through its data on
numeracy, literacy and problem-solving skills in technology-rich environments for adults (16-64 year-olds). The first results from the Survey were released in 2013 (OECD, 2013c, 2015c).

86. The Survey is not aimed at measuring the learning outcomes of higher education graduates, but it is possible to analyse the cognitive and workplace skills it measures for that subpopulation. Data for young graduates shows that attainment does not always translate into skill proficiency.

87. Although one might expect that the majority of young adults with higher education qualifications would perform at the highest levels in basic skills (level 4 and 5 in PIAAC), this is not the case in a number of countries (Kuczera et al., 2016). Around 15% of OECD young university graduates have literacy proficiency at or below level 2 (Figure 13), and around 21% have numeracy proficiency at or below level 2 (Figure 14) for the distribution of literacy and numeracy skills among young graduates, respectively. The spread of performance is particularly large in a group of countries, including the English-speaking countries of Australia, England, Ireland, the US, Canada, plus Italy, Spain and Poland where weak literacy and numeracy among graduates is relatively common.

Figure 13. Literacy skills of young university graduates (tertiary-type A only, 20-34 years old)

Note: Countries are ranked in ascending order of the percentage of graduates with literacy at or below level 2. In Austria, Czech Republic, Estonia, Finland, Flanders, Germany, Japan, Korea, Northern Ireland, Netherlands, Sweden and the US the estimated percentage of graduates performing at level 1 or below on literacy is not different from zero. Adults who obtained their highest qualification outside the host country: those with foreign qualifications and 1st generation migrants, who obtained their highest qualification prior to entering the host country, are excluded.

Figure 14. Numeracy skills of young university graduates (tertiary-type A only, 20-34 years old)

Note: Countries are ranked in ascending order of the percentage of graduates with numeracy at or below level 2. In Austria, Finland, Flanders, Germany, Japan, Northern Ireland, Netherlands and Sweden the estimated percentage of graduates performing at level 1 or below on numeracy is not different from zero. Adults who obtained their highest qualification outside the host country: those with foreign qualifications and 1st generation migrants, who obtained their highest qualification prior to entering the host country, are excluded.


88. In virtually all countries, significant shares of individuals with secondary education as their highest level of attainment outperform adults with a university degree. For example, Italy, Spain and the United States rank much higher internationally in the proportion of 25-34 year-olds with tertiary attainment than they do in literacy or numeracy proficiency among the same age group. Even more striking is that, on average, Japanese and Dutch 25-34 year-olds who have only completed secondary education easily outperform Italian or Spanish university graduates of the same age (Figure 15).
89. The performance gaps observed across countries cannot be explained by the proportion of the age group attending tertiary education. In Austria and Germany, a comparatively small share of 25-34 year-olds are tertiary graduates, but that age group performs around the average on the literacy scale, while Japan has a large share of tertiary graduates who do very well.

90. The results of PIAAC reveal that, in all but one participating country, at least one in ten adults are proficient only at or below Level 1 in literacy or numeracy. Level 1 or below in literacy means those who can, at best, read relatively short texts to locate a single piece of information that is identical to the information given in the question or directive or to understand basic vocabulary. In other words, significant numbers of adults do not possess the most basic information-processing skills considered necessary to succeed in today’s world. Some of those adults are young higher education graduates.

91. Skills and qualifications may diverge for several reasons. People may have acquired new skills since they completed their formal education or lost some skills that they did not use. Indeed, the longer a person is out of formal education, the weaker the direct relationship between his or her formal education and proficiency, and the greater the role of other factors that may affect proficiency, such as the work or social environment. In other words, a 55-year-old’s experience in formal education is likely to have less of a direct impact on his or her proficiency than that of a 26-year-old. But the survey results may also imply real differences in the relevance and quality of education in different countries, especially when we look at young graduates.
**Too many unprepared students may be entering higher education**

92. Given the fact that many OECD young graduates have literacy and numeracy proficiency at or below level 2, and that the situation is particularly worrying in some countries, the question of whether too many unprepared students are entering higher education emerges.

93. The expansion of higher education is being driven by students’ ambition to go to higher education, as a result of parental and societal aspirations. Higher education, especially university-type higher education, has a very high social status, which exerts a pull not achieved by other non-tertiary post-secondary provision. On the other hand, as discussed, higher education institutions in some countries are becoming increasingly dependent on tuition fees for their financial sustainability. These conditions may allow for some higher education institutions recruiting students who are not adequately prepared for higher education, either because the school system failed them, or for other reasons. In addition, these institutions may not provide these students with the necessary academic support to make up for their lack of preparation.

94. The answer to the question of whether too many students are going to university is not clear cut. It is true that some countries with above average higher education attainment also have an above average share of low skilled graduates, such as Poland, England, and Australia (see Figure 16 for tertiary-type A only). However, some countries reconcile above average higher education attainment with an above average share of skilled graduates: Finland, Japan, Norway and the Netherlands have similar or higher university attainment rates among young people but they report much lower shares of university graduates with poor basic skills. Some countries like Germany, Austria, Flanders and Sweden may even have an untapped pool of qualified potential students.
Figure 16. Are high rates of university attainment linked to low skills among graduates?

20-34 year-olds with tertiary A qualifications as their highest qualification (excluding adults with foreign qualifications and 1st generation migrants who obtained their qualifications prior to entering the host country); low skills refers to below level 2 in literacy or numeracy, 2012

How to read the chart: For example in England nearly 30% of adults aged 20-34 hold a university qualification (vertical axis) and around 7% of these graduates have low basic skills (horizontal axis).

Note: Values not different from zero are shown in a paler shade. In these countries there are very few university graduates with low basic skills. Adults who obtained their highest qualification outside the host country: those with foreign qualifications and 1st generation migrants, who obtained their highest qualification prior to entering the host country, are excluded. Source: OECD calculations based on the Survey of Adult Skills (PIAAC) (2012) (database).

95. One symptom that higher education institutions may be admitting students that are not prepared for higher education is the level of non-completion (OECD, 2015c). Around 30% of OECD students who start tertiary education leave without a degree (Figure 17). This high level probably reflects failures in the guidance process from compulsory to higher education, lower admission standards, as well as poor programme quality, and the financial cost of education (OECD, 2008b).
Figure 17. Proportion of students that start tertiary education and leave without a degree

2008

1. Includes students entering single courses who may never intend to study all courses needed for a degree.
2. Tertiary-type A only.
Notes: Countries are ranked in descending order of the proportion of students who leave tertiary education without obtaining a degree. Some of the students who have not graduated may still be enrolled, or may have finished their education at a different institution, as in the United States.
StatLink  http://dx.doi.org/10.1787/888933214592

There is a cost to society from low skilled higher education graduates

96. A lowering of skill proficiency at graduate level will affect labour market and social outcomes, and consequently returns to investment for individuals and society. Those with poor skills are more likely to be unemployed; and those who do find a job will be more likely to earn less than those with better skills.

97. These graduates will contribute less to society both as citizens and professionals; they will pay less taxes and are more likely to benefit from state transfers. In those countries where student loans are the norm, they may not earn sufficient to pay back their student loans (i.e. they will default on their loans or not earn enough to meet the thresholds in income contingent loan schemes). Much of the cost of a university education could then fall on the taxpayer (i.e. if the government guarantees the loans or has to accept unpaid debt).
In addition, the desire for credentials, if accompanied by low skill levels, is likely to undermine the value of those credentials in the labour market.

And higher education remains out of the reach of many

Disadvantaged students remain under-represented in many higher education systems

Despite massification and widening access policies, disadvantaged students remain under-represented in many higher education systems (Figure 18). Some 23% of younger adults whose parents did not attain upper secondary education attained tertiary education themselves, compared with 65% of adults of the same age whose parents also attained tertiary education (a difference of 42 percentage points) (OECD, 2015a). These trends show that there is room for reducing inequities to allow a greater proportion of individuals whose parents have low educational attainment to complete tertiary education.

Figure 18. Percentage of non-students who completed tertiary education, by age group and parents’ educational attainment (2012)

Survey of Adult Skills, average


StatLink http://dx.doi.org/10.1787/888933283558
And many of these students are not successful

100. Even if disadvantaged students participate in higher education, they are often concentrated in less prestigious institutions and/or degree programmes (Jerrim and Vignoles, 2015: 903; OECD, 2008a: 21). They are often less successful: they have lower progression and completion rates, and worse labour market outcomes (Bailey and Dynarski, 2011: 1; OECD, 2016: 75; OECD/European Union, 2015: 107).

Higher education could do more in terms of continuing education and life-long learning

101. Countries with rapidly ageing populations and shrinking youth cohorts will become more dependent on developing the skills of older adults. Participation in adult education and training is now common in many countries, but the Survey of Adult Skills indicates major differences across countries. Participation rates in adult education exceed 60% in Denmark, Finland, the Netherlands, Norway and Sweden, while in Italy they remain well below half that rate.

102. In many countries, higher education has focussed on educating school leavers and the curriculum, study periods and other factors are all geared to catering to young, full-time students. However, people are no longer expected to stay in the same job or even occupation throughout their working lives. Older adults may wish to enter (or re-enter) higher education to re-train or up-skill throughout their working lives. Firms and other organisations may seek to engage with higher education institutions to provide training for their workers to deal with new products, technologies and business processes.

103. Many adults may also wish to undertake short courses that do not lead to a qualification to acquire new knowledge and skills for work or personal interest. However, those with existing work and caring commitments may find it difficult to access higher education unless it is more flexible in its delivery. In this context, higher education institutions ought to cater more to older adult students.

Some countries are not fully exploring the benefits of internationalisation

104. Countries that attract international students are tapping the global pool for talent. Some countries have even eased their immigration policies to encourage the temporary or permanent immigration of international students. These countries will benefit from better human capital in their economics and society.

105. On the other hand, other countries are curbing international student numbers as a result of more strict immigration policies, as a backlash to significant increases in migratory flows. These can potentially make their higher education systems and their economies less competitive in the global arena.

106. Countries that charge international students the full cost of education also reap significant economic benefits. For this reason, several countries have policies to attract international students on a revenue-generating or at least cost-recovery basis.

107. Some countries have less success in attracting international students and researchers which hinders their competitiveness in the search for talent and in the economic impact of their higher education system. It also diminishes the exposure of home students to international students, and thus their capacity to operate in global environments later on.
It is sometimes difficult for students to assess the quality of cross-border higher education

108. Cases of fraud and opportunistic behaviour have shown that cross-border higher education comes with risks for students and other higher education stakeholders.

109. Despite general compliance with the UNESCO/OECD Guidelines, it is often still too difficult for students and other stakeholders to easily access the information they need to assess the quality of cross-border provision or to understand the process of quality assurance that foreign providers or programmes undergo (Vincent-Lancrin et al., 2015).

There are questions about well higher education is contributing to innovation

Higher education still plays a minor role in innovation

110. As seen above, expenditure on higher education has been growing and reached 1.6% of GDP in 2011. R&D intensity has also increased to 2.4% of GDP in 2013 (OECD, 2015b). A significant amount is spent on research in higher education: higher education expenditure on R&D (HERD) accounts for 0.4% of GDP in the OECD area (Figure 19).
R&D expenditure refers to basic research but also applied research and experimental development. Basic research is concentrated in universities and government research organisations, and spending on basic research has been increasing faster than applied research and experimental development.

Investment in innovation is growing, but it is mostly driven by business R&D. Higher education still does not attract much funding for research and development from business enterprises and the private non-profit sector and often it is not doing enough to close the gap between basic research and the development of new products and processes (Figure 20).
Innovation is a complex process and often involves many actors and linkages for knowledge production and use. One way to capture its systemic dimension is to examine the information sources firms use for their innovation activities. Market sources predominate in all countries, while institutional sources, including higher education, play a much smaller role (Figure 21). Less than 10% of product and/or process-innovating firms rank them as “highly important”.
Most doctorate holders are employed in government-dependent sectors

A reflection of the distance between higher education and applied research and experimental development is that, with few exceptions, the majority of doctorate holders in OECD countries are employed in government-dependent sectors, such as education, human health and public administration, and less in the business enterprise sector and the private non-profit sector (Figure 22).

Note: International comparability may be limited due to differences in innovation survey methodologies and country-specific response patterns. European countries follow harmonised survey guidelines with the Community Innovation Survey. See www.oecd.org/sti/inno-stats.htm for more details.

Source: OECD based on Eurostat, Community Innovation Survey (CIS-2012) and national data sources, June 2015. See chapter notes.

StatLink  ➤ http://dx.doi.org/10.1787/888933274043
Incentives for academic staff hinder the broader societal impact of research

115. Academics and higher education institutions are disproportionately rewarded for the scientific impact of research (Fumasoli et al., 2015; Teichler and Höhle, 2013).

116. There are established methods for measuring the scientific impact of research (i.e. the recognition given by other academic authors to published research), especially in sciences, with the significant development of bibliometrics and scientometrics. The measure of scientific impact of research tends to be higher for publications that report basic research rather than applied research or experimental development.

117. In addition, with current methods, it is more difficult to measure the scientific impact of arts, humanities and social sciences, and even more difficult to measure the societal impact (i.e. the economic, social and cultural impact, instead of scientific impact) of any kind of research with existing methods (van Raan, 2005). As such, there are few incentives to produce research which is relevant to society.
Successful research is becoming increasingly specialised but countries often fail to act accordingly

Research is becoming increasingly specialised but higher education systems in many countries fail to play to their strengths in research (OECD, 2015b). In some countries the quantity and quality of scientific production do not always coincide: some countries produce most in areas where they do not excel, and less in areas where they have a comparative advantage in terms of the quality of research (contrast Figure 23 and Figure 24).

Figure 23. Field specialisation in scientific publication output, 2003-12

Relative activity indices, top two most specialised fields per country


StatLink: http://dx.doi.org/10.1787/888933273668
119. Research has both a national and an international aspect, but excellent research tends to be concentrated in a number of countries or in major research institutions. Some countries, namely smaller countries such as Ireland, Belgium and Switzerland, engage actively in international collaboration, but many countries still fail to foster this type of collaboration to improve their research capacity.

**Some countries fail to reap the benefits of international collaboration**

120. The international mobility of highly skilled individuals, from students to scientists, is one of the major drivers of knowledge circulation worldwide. International research collaboration has nearly doubled since 1996, reaching almost 20% of all scientific publications in 2013. Scientific collaboration is an increasingly pervasive feature of research excellence (OECD, 2015b).

121. Scientists with a history of mobility are more likely to publish in high-impact journals (Figure 25). Governments, particularly in the European Union, also play an important role in the globalisation of R&D by funding international programmes and activities.
There is a positive relationship between measures of scientific research collaboration and citation impact (Figure 26). This relationship appears to be stronger in economies with lower levels of scientific production, highlighting the importance of scale, which smaller economies attempt to overcome by participating more intensively in global networks.
Figure 26. The citation impact of scientific production and the extent of international collaboration, 2003-12

Despite progress in open access, the results of publicly-funded research are often not publicly available

However, in most OECD countries, the share of documents published in OA journals is very small (less than 10%, Figure 27), as the implied citation “prestige” of journals as measured by citation indicators, is higher for documents published in non-OA journals. In Scopus, 2,800 titles, i.e. only about 12% of the 22,283 active journals covered, are identified as being OA journals.
There is a problem with gender equity in research

126. The flow of new doctorates awarded to women has grown at a higher annual rate than for those awarded to men. However, the gender gap remains very large in the field of engineering, with men accounting for nearly 80% of all doctoral degrees. Women hold 40% of doctoral degrees in science, and are on par with men in the social sciences and humanities. In health-related disciplines, the share of degrees awarded to women has increased from 50% in 2005 to 60% in 2012.

127. However, there are considerable differences across countries in the share of women among authors who are designated as corresponding authors, a proxy for leadership in the context of research collaboration. The data suggests that gender equality in scientific publishing and team leadership is not occurring as rapidly as in careers.
There are questions about how well higher education is contributing to social, cultural and environmental development

**Higher education is expected to produce societal impact but performance in this area is difficult to assess**

128. Countries are increasingly asking higher education to engage more effectively with the wider world through the provision of continuing education; technology transfer and innovation and social engagement. However, academics and institutions have few incentives to perform well in this dimension (Ćulum et al., 2012).

129. Higher education’s contribution in most of these areas is difficult to measure (Bornmann, 2013). Technology transfer is easier to measure (via licencing of patents, royalty income, number of spin-off and start-up companies). For this reason, policies often prioritise the uptake and development of tangible technologies, while mechanisms to support social entrepreneurship and innovation for wider needs have been limited. There has also been less emphasis on services, which account for 70% of the workforce in the OECD countries (OECD, 2007).

**These concerns are leading to demands for better performance from higher education systems**

**Performance measurement in higher education**

130. Concerns about the performance of higher education date from the transition from elite to mass higher education systems (Trow, 1973). Performance measurement in higher education has gone through different phases, mimicking what has happened in other public services, resulting from increased pressure on the public purse as a result of their growth, with raising expectations on the part of citizens regarding their quality and equity (Sarrico, 2010).

131. As with other public services, governments want value-for-money from their higher education systems, which can be assessed using the criteria of economy, efficiency and effectiveness:

- **Economy**: Can higher education minimise its costs?
- **Efficiency**: Is higher education making the most efficient use of resources made available to it?
- **Effectiveness**: How effective is higher education: has quality and equity accompanied quantity?

132. In addition governments want higher education to be relevant to the needs of society, and its outcomes useful and sustainable.

**Financial performance**

133. The costs of higher education have increased much faster than productivity with the massification of higher education.

134. Governments have looked for more economy in the higher education system (i.e. cost savings where higher education is asked to produce the same with less, leading to the erosion of per capita funding), or ways to increase its efficiency (doing more with less, e.g. by increasing student-staff ratios).

**Operational performance**

135. As previously seen, higher education has expanded, but often the output has not kept pace with the input: graduates have not increased at the same rate as students, and publications have not always
increased at the same rate as research funding. As a result, governments focussed on productivity, for instance, demanding an improvement of progression and completion rates in teaching and learning, and publications in research and scholarship (‘publish or perish’).

136. This has led to the introduction of quantitative performance indicators (Cave et al., 1988) and the general rise of the ‘evaluative state’ in higher education (Neave, 1988). But the pressure for economy and efficiency has also led to a general loss of trust in the quality the education provision and the quality of research (Massy, 2003; Trow, 1996).

137. As increased pressure for economy and efficiency threatens effectiveness (e.g. poor learning outcomes for students and poor quality research), performance measurement has shifted to quality. The emergence of the quality movement saw the rise of qualitative performance indicators to complement the quantitative performance indicators of economy and efficiency (Cave et al., 1997).

138. The qualitative performance indicators are mostly derived from teaching and research reviews based on peer review, i.e. by other academics within higher education. In addition, the results of external reviews have been increasingly linked to performance-based funding.

139. While massification and widening access policies has brought more people into higher education, often from traditionally underrepresented groups of society, there are concerns about the success of these groups of people (i.e. their access, progression, completion and labour market outcomes) (Goastellec, 2010). Equity – another aspect of effectiveness – has therefore become a key focus of governments.

External performance

140. At the beginning of the quality movement in higher education, quality was still very much seen as ‘internal quality’, as it was mostly reviewed by academics within the system. The debate on quality then moved to a more ‘external quality’ perspective, resulting from the consumer movement and the view of the student as consumer.

141. As seen above, the increase pressure on state budgets from higher education saw the increase of ‘cost-sharing’ policies. This often meant the uncapping of student numbers, the introduction or significant rise in fees, and the general creation and/or development of a market in higher education. Higher education became increasingly driven by the market, and in some countries higher education has become as well an important export industry.

142. The student as consumer meant that the judgement of ‘quality’ of education was no longer mostly the preserve of the teachers (i.e. academics), but also of the learners (i.e. students). The student experience became an important aspect of quality assessment, which saw the rise of student satisfaction surveys; in some countries at a national level. This external focus on performance extended to other ‘consumers’ or stakeholders of higher education, such as employers, alumni, industry, government, the third sector, and society at large.

143. Research and scholarship saw the rise of bibliometrics and scientometrics (includes patents and other outputs apart from publications), complementing peer review of research quality, and increasingly the assessment of the societal impact and relevance of research, based on the assessment of impact case studies and the development of altmetrics (such as article views, downloads, or mentions in social media and news media), and measures of collaboration with people and organisations from outside academia.

144. External review panels, both of teaching and research, increasingly include other stakeholders apart from academic peers, such as students, employers, lay members from industry, local authorities, and
third sector organisations. All these assessment exercises generate information, quantitative and qualitative, which further helps to develop a market for higher education.

145. Governments want an economic, efficient, effective system in terms of learning and teaching, and research and scholarship, but increasingly they also want universities to be more engaged with the rest of society, serve a wider range of stakeholders and demonstrate its relevance. Governments ultimately want that the outcomes of higher education have utility and sustainability.

Developmental performance

146. As a result of the performance measurement trajectory of higher education described above, developmental performance efforts are increasingly present in higher education (Webber and Calderon, 2015). This uses the measurement of performance (metrics) to inform the management of performance (practice), ideally in an enhancement cycle, namely on issues such as:

- Admissions
- Student support
- Career guidance and counselling
- Staff development
- Innovation in teaching, including the use of new teaching and learning technology
- Initiatives to develop research capacity and specialisation
- Initiatives to develop engagement activities
- Institutional research
- Management and governance of institutions

Demand for information is driving the establishment of national and global rankings – but they tell a very limited story

147. The creation of national and global markets for higher education have triggered the demand for information on the performance of higher education institutions and the establishment of national and global rankings, mostly by media outlets (see THE World University Rankings, QS World University Rankings, Academic Ranking of World Universities by Shanghai Jiao Tong University, US News Education Rankings, etc.).

148. These exercises have many shortcomings that have been well documented, among them reliance on input measures as proxies for output, reputation surveys, and a bias towards research performance (Rauhvargers, 2013). Despite the fact that methodology and proxy indicators adopted by existing world university ranking systems continue to be controversial, they are nonetheless reshaping universities’ strategic planning and national higher education reforms (Hazelkorn, 2015).

149. Nevertheless, meaningful data and indicators have not been collected or developed yet. In addition, the statistical unit for most rankings is the institution, which tells us little about higher education system performance as a whole.

150. Universitas 21 claims to be the only ranking to assess national higher education systems (Williams et al., 2016). But it also acknowledges that 'The mix of regulation and policy settings used by governments is hard to encapsulate in a single measure', and that no measure of the 'quality of graduates' or 'interaction between institutions and industry partners' is included (Williams, 2013).
A benchmarking approach to enhancing higher education system performance

151. The OECD proposes to address the identified knowledge gap, in order to better understand higher education system performance as a point of departure to enhancing that performance.

Benchmarking

152. The OECD proposes a programme of work to contribute to the enhancement of performance of higher education systems, which includes a different approach from league tables and rankings - a benchmarking approach to higher education system improvement.

153. The benchmarking approach goes beyond metrics to focus also on policy and practice benchmarking in order to tell the story behind the performance of higher education systems. It will enable cross-country comparisons and peer learning to support the developmental dimension of performance measurement and management, and inform higher education policy design, implementation and evaluation.

Comprehensive and holistic approach

154. The proposed benchmarking approach to enhancing higher education system performance acknowledges the economic, social and cultural context of higher education. It considers the three main functions of higher education, education, research and engagement with the wider world, and includes all levels of higher education from short-cycle higher education to doctoral level.

Developmental approach

155. The benchmarking approach will be a tool for developing higher education systems and enhancing their performance. It will provide governments with evidence and data to strengthen policy making, and it addresses the strong demand for the comparative assessment of higher education systems.

156. The benchmarking project will identify data gaps and drive better data collection, in order to have international comparable measures, which will create a common language regarding higher education system performance. As such, it may make better use of national data and improve institutional performance management systems.

157. Each consecutive benchmarking exercise will build an evidence base, which will be very valuable for further policy analysis work, and stimulate further research on higher education systems. By taking a longitudinal approach each benchmarking exercise will allow for monitoring progress over time.

158. The proposed approach will be adaptable to emerging policy priorities, and it will connect to other OECD and other inter-governmental organizations' work.

159. Finally, the project will raise the visibility of the importance of higher education for developing our economies and societies.
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CHAPTER 3. BENCHMARKING HIGHER EDUCATION SYSTEM PERFORMANCE: A CONCEPTUAL FRAMEWORK

Rationale

160. Many countries share common concerns about the performance of their higher education systems and would like to learn how well their systems are performing in comparison to others. Cross-country comparisons through the international benchmarking of different higher education systems will enable countries to learn more about their strengths and weaknesses and provide ‘a laboratory for others’ by identifying what works in higher education. Benchmarking higher education system performance will contribute towards improvement across different higher education systems.

161. The benchmarking analysis will be done at the system level in recognition of the diversity of higher education systems and the contribution all higher education institutions make. The higher education system could be either national or at other relevant jurisdiction level, such as state or province, depending on the government arrangements of each country regarding higher education.

162. The OECD can add value by helping countries collectively address their concerns about their higher education systems through the following means:

- Collecting and analysing internationally comparable data
- Connecting with other OECD analysis (e.g. skills, research and innovation)
- Monitoring developments in a complex, rapidly evolving sector
- Facilitating policy dialogue and peer learning internationally
- Identifying long-term trends and issues
- Providing relevant policy advice

Goals

163. Benchmarking the performance of higher education systems through OECD multi-dimensional measures will:

- Enable comparisons across agreed dimensions of performance of higher education systems
- Identify strengths and weaknesses of each country’s higher education system
- Provide a basis for peer learning
- Provide a basis for developing strategies for improvements in the performance of higher education systems.

Guiding principles

164. A framework for benchmarking higher education system performance that enables comparisons between countries, provides a basis for peer learning, is oriented towards performance improvement, and has a longitudinal timeframe should be underpinned by some guiding principles (UKPISG, 2014).
The following principles will guide the OECD benchmarking work, in order to facilitate meaningful comparisons between higher education systems to enable countries to learn from each other and identify strengths and weaknesses within their own higher education systems; and help the OECD develop robust, evidence-based policy advice.

The development of the project should be assessed against these principles. However, the principles are meant to be guiding rather than binding. They may evolve as a result of the discussions between the Secretariat and the governing board responsible for the project.

**Theoretical justification**

- The benchmarking exercise should be based on a theoretically-justified conceptual model.

**Breadth**

- The benchmarking exercise should reflect the entirety of higher education provision, from short-cycle tertiary education to doctoral level.
- The benchmarking exercise should take into consideration the three missions of higher education: education (learning and teaching), research, and engagement with the wider world (third mission).
- The benchmarking exercise should recognise that there are many dimensions of performance and the importance placed by each country on different dimensions may differ.
- The benchmarking exercise should be context aware, i.e. acknowledge the economic, social and cultural context in which higher education operates.
- The benchmarking exercise should recognise that countries have different system features, constraints, challenges and policy priorities that need to be taken into account to enable meaningful comparisons.
- The benchmarking exercise should ensure continued responsiveness and relevance of the benchmarking work to participating countries and be able to evolve over time in line with their needs.

**Quality of data**

- The benchmarking exercise should use international comparable indicators produced by the OECD and other credible organisations, such as UNESCO and Eurostat. When using other indicators and data, namely national data, which is not strictly comparable, this will be explicitly noted and all caveats stated.
- The benchmarking exercise should be evidence-based and statistically robust, conforming to recognised best practice in the production of statistical information. Data used for the indicators should be of high quality, and collected in a consistent way across the countries (or relevant jurisdictions). Indicators should have a good sample base, use consistent definitions, and use a transparent methodology.
- The benchmarking exercise should be regular (every two years), enabling a time series to be developed and the ability for users to conduct longitudinal analysis.
- The benchmarking exercise, with time, should incorporate new indicators, developed to address identified gaps, in response to policy needs.
Dissemination

- The results of the benchmarking exercise should be published regularly (every two years).
- Details of the methodology and benchmarking process should be made available at the same time for the benefit of all users: governments, higher education representative bodies, and all relevant higher education stakeholders.
- The publication of the results of the benchmarking exercise should include guidance for readers and contextualisation to facilitate appropriate interpretation of the results.

Enhancement

- The benchmarking exercise should not imply any system ranking. It should provide governments with evidence and data to strengthen policy making and the development of the higher education sector.
- The benchmarking exercise should take account of context and different system characteristics, thus supporting its peer learning approach.
- The project should be informed by a broad stakeholder dialogue process to ensure that the views, insights and perspectives of higher education institutions; their representative bodies such as national rectors’ conferences; regional and international networks and groupings of higher education institutions; and other stakeholders are properly taken into account. Additional stakeholders will include student groups, employers and unions, representatives of academic and other staff, foundations and research centres working in higher education.

Data collection

- Whenever possible, the benchmarking exercise should use existing data, and connect to other OECD and other inter-governmental organisations' work.
- The benchmarking exercise should provide information on identified data gaps to drive better data collection.
- Any proposal to develop new indicators should be decided by the governing board responsible for the project in co-operation with the INES Working Party, as a response to emerging priorities.

Functions and scope of a higher education system

167. Higher education systems are complex, with a variety of higher education institutions delivering programmes in different fields of study and at different levels. Higher education institutions within a national system can have very different missions and perform a range of functions. It is therefore important to define the functions of higher education and a working boundary of the systems for the purposes of the benchmarking project.

168. This project recognises that higher education systems perform three main functions: education (learning and teaching); research; and engagement with the wider world, i.e. industry, government and society (often referred to as the ‘third mission’ of higher education).

169. A high-performing higher education system is one where its higher education institutions taken together perform the three main functions of education, research and engagement with the wider world.
(though some higher education institutions may not perform all three) to produce outcomes that meet the needs and objectives of students and their families, employers, the economy and society.

170. The scope of the higher education system for benchmarking higher education system performance will include all programmes at ISCED 2011 levels 5, 6, 7 and 8 regardless of the institutions in which they are offered. The ISCED 2011 levels 5, 6, 7 and 8 are as follows (OECD et al., 2015):

- Level 5: short-cycle tertiary education programs;
- Level 6: Bachelor’s or equivalent first degree programs;
- Level 7: Master’s or equivalent programs;
- Level 8: Doctoral or equivalent programs.

**Definition of key terms**

171. Benchmarking, as a tool for performance improvement, is not new, both in the private and public sectors of the economy (Johnston et al., 2012). In higher education, benchmarking has been used predominantly at the institutional level and is often linked to quality assurance and the management of institutions and the concept of continuous improvement (ESMU, 2008). Rankings also provide a well-known and increasingly popular type of benchmarking higher education institutions (Hazelkorn, 2015). These forms of benchmarking commonly set targets against which institutions can compare their performance.

172. However, the value of benchmarking at a systems level is reflected in the recent Universitas 21 (U21) ranking of 50 higher education systems – the only ranking system that takes a system-level approach in higher education (Williams et al., 2016). The U21 rankings were developed as a benchmark for governments, higher education institutions and individuals on the basis that it is “the higher education system as a whole, not only of research intensive universities, that matters for the economic and cultural development of a nation. Different institutions will contribute in different ways to achieving overall national objectives …” (Williams et al., 2016: 6).

173. However, despite the prevalence of various benchmarking instruments in higher education at either institutional or system level, there are no standard definitions for many of the terms used in benchmarking and they can have different meanings and be used in different ways (Harvey, 2004-16).

174. More importantly, our approach is not to develop a ranking of higher education systems. The OECD benchmarking higher education system performance project therefore will not set targets or metric measures against which countries can compare their performance. Instead, the benchmarking higher education system performance project will present data and information that countries can use to identify the strengths and weaknesses of their higher education systems and compare their performance against other countries in order to learn from each other.

175. The following terms are therefore defined as follows for the purposes of this project:

- **Benchmark**: The observed performance of a higher education system to which other higher education systems can compare themselves.
- **Benchmarking**: The process of comparing higher education systems, including policies, practices and outcomes, to enable countries to identify strengths and weaknesses in their higher education systems; learn from each other; and improve the performance of their higher education systems.
• **Higher education system performance**: The capacity of the higher education system to meet its stakeholders’ needs and objectives in relation to its main functions of education, research and engagement with society.

**Types of benchmarking**

176. Benchmarking higher education system performance will use three kinds of benchmarking:

• **Metric benchmarking**: Metric benchmarking will be used to present performance information so that countries can identify the strengths and weaknesses within their own higher education systems and compare their performance against other countries. This approach contrasts with conventional metric benchmarking where an organisation establishes how well it is performing relative to a benchmark ‘target’.

• **Practice benchmarking**: Information on higher education practices (or activities) will be presented to enable the comparison of higher education system performance and a better understanding of the reasons behind the performance. This approach will identify which practices produce better outcomes and help countries share new ideas and practices.

• **Policy benchmarking**: Government policy is a key driver of the performance of higher education systems. The comparison of policies between different systems has the potential to lead to a better understanding of the linkages between policy and outcomes, generating learning and the development of new policies for improved performance.

**Coverage**

177. The benchmarking project will use quantitative data and qualitative information across a range of performance dimensions set within the overarching conceptual framework. Data and information will be used to capture: the economic, social and cultural context within which the higher education systems operate; their structure, organisation and governance arrangements; their major higher education policies and implementation mechanisms; and system performance.

178. Both quantitative and qualitative information will be collected from participating countries to provide a description of the contextual environment, the higher education systems and their performance.

179. The performance of higher education systems will be captured through a range of data sources:

• Quantitative indicators: the OECD’s and other internationally comparable indicators, and indicators from national sources (not necessarily strictly comparable);

• Standardised qualitative information collected from countries, presented in synthesis tables.

180. The project will draw on existing data and information before identifying what additional data is most relevant to policy makers. The development and ongoing implementation of the project will entail horizontal collaboration with the INES Working Party and its networks to ensure greater synergies in tertiary education indicator developments in the future. This will guarantee that the work across the OECD is targeted to what countries want and avoid duplication of effort or wasted resources.
Higher education system performance model

181. Performance is often defined as outputs and outcomes. However, this does not provide much information on the substantive content of performance. It is therefore important to collect data and information on what goes on within higher education systems (the inputs and activities) in order to analyse the factors leading to the outputs and outcomes. In this way, benchmarking higher education system performance can provide a model for action at a system level, not just data on the number of graduates or research publications.

The model

182. The higher education system performance model (Figure 28) is drawing on a long history of performance measurement and management of the public sector.

183. Concerns about the performance of public services have been longstanding and have led to the implementation of various policies and mechanisms to improve performance (Talbot, 2010). They have also led to the development of various tools to better understand, measure and manage the performance of public services.

184. A comprehensive model that describes performance measuring and managing of the public sector has grown out of a body of work developed through the OECD Public Management Programme (PUMA) (now The OECD Public Governance Committee) (OECD, 1997) and others (European Communities, 1997; Hatry, 1999; Poister, 2003). This model has been updated more recently based on the public sector case studies of different OECD countries (Bouckaert and Halligan, 2008). It enables an assessment of the complete ‘span of performance’: economy, efficiency and effectiveness, by covering the whole chain of production from input to outcome. The inclusion of the socio-economic situation and needs of society also enables an assessment of the relevance, utility and sustainability of systems. It is therefore a useful model to conceptualise higher education system performance.
185. This model shows that the higher education system sits within a wider socio-economic situation. Socio-economic issues induce policies for meeting society's needs. These societal needs are defined by higher education stakeholders, which prompt action from the political system to determine priorities. These priorities are translated into objectives for the higher education system. Inputs of capital and labour are acquired to conduct activities of the three processes of higher education - education, research, and engagement - in pursuit of the defined objectives. The outputs are the products of these processes - what higher education delivers to the outside world (such as graduates, publications, start-ups and spin-offs). The outputs then interact with the environment leading to intermediate and final outcomes (such as students getting jobs and being competent in them). In the end, the value of processes and outputs results from their outcomes.

186. The higher education system performance model demonstrates how an analysis of higher education systems can take account of the stages of performance (inputs, activities, outputs and outcomes) as well as the relationship between the stages of performance and the socio-economic situation, needs, objectives and context within higher education systems.

187. People have criticized the mechanistic and all too-rational character of this type of production model when applied to the complexity of public sector in general, and by consequence to higher education in particular. However, the model is just that, a model - a simplified and idealized understanding of reality, which allows us to conceptualise and analyse a higher education system in order to better understand it.
Span of performance

188. As demonstrates, the model can also demonstrate how the analysis can provide an understanding of different spans of performance:

- Relevance – are policies meeting societal needs?
- Economy – can money be saved?
- Efficiency – can the system be more productive?
- Effectiveness – is the system achieving the intended outcomes?
- Utility and sustainability – how useful and durable are the outcomes?

189. By focussing on specific areas (e.g. quality, equity, the employability of graduates, and internationalisation), the model can be used to analyse the associated span of performance and get a better understanding of 'what works' in higher education systems in those domains through internationally comparable data (see Table 1).
Table 1. Applying the higher education system performance model

<table>
<thead>
<tr>
<th>Using the model</th>
<th>Stages of performance</th>
<th>Span of performance</th>
</tr>
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<tbody>
<tr>
<td>Problems, needs and relevance</td>
<td>Socio-economic issues (problems) prompt a need for action by government. Government (with stakeholders) defines the needs of society. Government translates the needs into policies and objectives for higher education (systems and/or programmes).</td>
<td>Relevance: Are the policy objectives meeting the needs of society?</td>
</tr>
<tr>
<td>Outputs and efficiency</td>
<td>Inputs (e.g. financial and human resources) are allocated to the higher education system (HEIs and programmes). The inputs provide the resources for the activities within the system (in HEIs). The activities produce the outputs of higher education, i.e. the immediate products and services of education, research and engagement activities.</td>
<td>Economy: How much do the inputs cost? Can money be saved? Efficiency: What is the relation of outputs to inputs in the higher education system? Can the efficiency of the system be increased?</td>
</tr>
<tr>
<td>Outcomes and effectiveness</td>
<td>The inputs and activities which produce outputs produce in turn intermediate outcomes (or impacts) that are more directly attributable to the specific interventions of higher education institutions. The intermediate outcomes lead to final outcomes that meet the needs of society and therefore the objectives for higher education.</td>
<td>Effectiveness: Are the outputs leading to the desired outcomes of the higher education system, in terms of quality and equity? Can the effectiveness of the system be improved? Cost-effectiveness: How much does it cost to achieve the desired outcomes? How does it compare to other systems? Utility and sustainability: How useful are the outcomes in meeting the needs of society? Can the outcomes be sustained, i.e. are they durable, could they become the norm?</td>
</tr>
</tbody>
</table>
Context

190. The proposed model suggests that context has a very important influence on the final outcomes and on the general performance of a higher education system. The higher education system itself often has limited or no control over some factors which influence final outcomes, e.g. socio-economic trends which may influence graduate employment outcomes, and indeed on the stages of the process to arrive at those final outcomes.

191. The significant importance of context suggested has been recognised in Figure 28 above, which shows that context is an all-encompassing presence in the model. Context is thus extremely important to understand the performance of a higher education system, it adds complexity to the problem, it will often be incomparable between systems, and it will influence all stages and spans of performance.

192. It will be difficult to set boundaries for context. However, we envisage considering major factors influencing the environment and thus performance of higher education systems in our analysis. These could include major economic indicators, key socio-demographic indicators (size of the population, age structure of the population, income inequality, migration, etc.), the political and the higher education system, major socio-economic and higher education policies, and key events in higher education in each system.

REFERENCES


CHAPTER 4. BENCHMARKING HIGHER EDUCATION SYSTEM PERFORMANCE: DATA ARCHITECTURE

Performance Dimension Framework

193. This chapter presents the performance dimension framework to be used to organise the benchmarking data. The data and information collected for benchmarking higher education system performance needs to be organised in such a way that facilitates analysis and meets the goals of the project. This will enable countries to identify the strengths and weaknesses of their higher education system; compare their performance against other countries; learn from each other and develop strategies for improvement in their higher education systems.

194. The performance dimension framework starts from the conceptual analysis of the higher education system described in the previous chapter. The framework is not based on data availability but on what is conceptually desirable. This approach will enable the implementation of a framework with existing data and ensure the possibility of expanding the data once more becomes available. It will also highlight areas that are not covered by existing data. This should help countries decide where to invest in the development of new data in the future (see the following chapter on the benchmarking data).

195. The adopted approach largely follows an ontology-based data management approach, i.e. the conceptual structure of the data is driven by the higher education system performance model described previously (Daraio and Bonaccorsi, 2016), rather than one that starts from user requirements or data availability. Using this approach, the choice of possible indicators and the way they are organised is based on concepts of higher education. Concepts are a way of understanding the higher education system and its building blocks, such as the three functions of higher education (education, research, engagement), the stages of the production process (inputs, activities, outputs and outcomes), and the other aspects of the higher education system performance model. Concepts must have an explicit definition which is independent of any data that is currently collected. In this way, the dependency of indicators on existing databases, which is the traditional approach, is broken.

196. This approach allows the analysis of the concepts and the links or relationships between them. In this way, indicators can be generated from the combination of concepts (for instance, efficiency will be outputs over inputs).

197. Once a data framework is designed following this approach, it will be possible to implement the framework by combining existing data from different sources that map to the framework, detect gaps in existing data, and possibly invest in collecting data and develop new indicators in areas where gaps have been detected.

198. Following from the higher education system performance model, the performance dimension framework (Figure 29) will organise data for each of the three key functions (education, research and engagement) across the different stages of performance (inputs, activities, outputs and outcomes). In addition, the framework allows for the separate presentation of data and information on context and financial and human resources.
Figure 29. Performance Dimension Framework

Context

199. As noted before, the economic, social and cultural context in which higher education operates will affect higher education performance at all stages of performance from input to outcome. This means that a good understanding of context will be paramount in understanding the performance of higher education. Ultimately, observed outcomes will be a function of the performance of the higher education system, but also of contextual variables that the system does not control.

200. The proposed performance dimension framework organises data on context separately in recognition of its impact on how higher education systems operate across its three main functions of education, research and engagement. This will ensure the analysis includes a general overview of context for the OECD and participating countries, and of each country. This approach draws on the Pollitt and Bouckaert (2011) comparative studies of public management in different OECD countries.

Economic, social and cultural context

201. In the higher education system performance model context is given an important role impacting the performance of the system. In its broadest sense, context will mean the economic, social and cultural context within which higher education operates. We will offer a description of the general climate for
OECD countries over a period of 10 years, and then a specific note on each participating country. These will include information on major economic indicators and key socio-demographic indicators.

**Major economic indicators**

202. Macro-economic features influence the environment for higher education. In general, a well-performing economy will have a positive influence on state budgets and more resources are likely to be available, including for higher education; and the reverse is often true in economically bleaker times. In addition, economic pressures often trigger reforms because of the need to find savings and efficiency gains.

203. The economic context will not only affect the level of resourcing but also the final outcomes of higher education. For instance, the labour market outcomes of graduates tend to suffer when the economy is not doing well, irrespective of the performance of higher education in producing good quality graduates with the expected skills.

204. The analysis of higher education system performance will therefore take account of the general macro-economic trends for the OECD and for participating countries, and it will include:

- economic growth: real GDP growth
- exposure of governments to international economic cycles: international trade in goods and services as a percentage of GDP
- government spending: general government expenditure as a percentage of GDP
- government debt: general government gross financial liabilities as a percentage of GDP

**Key socio-demographic indicators**

205. Higher education is also influenced by socio-demographic factors. Ageing populations is a common phenomenon in OECD countries. Its extent varies and so does the pressure it puts on social expenditure, the ageing of higher education staff, the age structure of potential students, and the study programme provision of higher education institutions.

206. Income and education inequality will also be of interest, particularly in the measurement of equity in higher education.

207. The considerable international migration, for economic, political and other reasons, such as studying, and the free movement of people, will present challenges for how higher education deals with the increasing multilingual and multicultural communities it serves.

208. Finally, size matters, and we will be dealing with very different countries in terms of the size of their population, from quite small and homogenous countries to quite large and diverse ones. Size will often provide economies of scale and scope, which will be more difficult to obtain for smaller countries.

209. The analysis therefore will include the following indicators for participating countries:

- The age structure of the population
- The population aged 16-24 as a percentage of total population, and its forecast for the coming years
- Income inequality Percentile 90/Percentile 10 and Percentile 50/Percentile 10
- Education inequality Percentile 90/Percentile 10 and Percentile 50/Percentile 10
• Foreign-born population as a percentage of total population and the estimated total population

Structure and governance

210. The shape and size of higher education systems also varies considerably. Systems are governed by different influences and interests of the society at large, moderated by governments in their steering and supervisory roles, the institutions of higher education and their staff as well as the learners, and increasingly by a market for higher education.

Higher education structure

Responsibility for higher education

211. Responsibility for higher education steering will vary among countries, and is often linked with the nature of the state itself: federal or unitary. Irrespective of the system of government, higher education responsibility can be more centralised or more devolved to local and regional jurisdictions.

Main legal framework

212. The analysis will take account of the main legal documents setting the framework for higher education institutions, including the definition of the legal status of institutions (state agency or legal independent person), autonomy laws, regulatory frameworks including accreditation and quality assurance, staff careers, access to higher education, funding, student support, etc.

Degree structure

213. The benchmarking project will consider all tertiary education ISCED levels, but different countries operationalise the classifications in different ways. The analysis will present a breakdown of the degree structure in participating countries as well as how degree programmes are distributed among different types of institutions.

214. It will also include a description of higher education credit systems and their transferability across different types of higher education institutions.

Types of institutions

215. As mentioned before, one of the current features of higher education is its increasing diversification. The benchmarking project will provide a description of the type of institutions operating in each system, including the unitary or binary character of the system, the existent of public and private sectors, with for-profit or not-for-profit subsectors, their size and roles.

Higher education authorities and organisations

216. Higher education is characterised by a multiplicity of actors, such as accreditation and quality assurance agencies, funding councils, research councils, regional development agencies, innovation agencies, rectors' conferences, national student unions, association of universities, staff unions, professional bodies, and employer associations. The analysis will consider their role in each system.

217. In addition, it will consider the existence and role of higher education coordination bodies, such as overarching national councils where relevant stakeholders sit. This will include any consultation
processes in place to build shared vision and policy consensus, as well as articulation with upstream (secondary education) and downstream (world of work) levels in the education chain.

Governance

218. Higher education governance relates to the way higher education systems and institutions are organised and managed. It encompasses the structures, relationships and processes through which, at both national and institutional levels, policies for higher education are developed, implemented and reviewed. It therefore comprises a complex web of legislative frameworks, the characteristics of institutions and how they relate to the whole system, how money is allocated to institutions and how they are accountable for the way it is spent. It also relates to less formal relationships and structures which steer and influence behaviour (OECD, 2008). Higher education governance therefore deals with how authority is distributed between the state power, institutional autonomy, and market forces (Clark, 1983) and the relationship between higher education institutions and government, business and communities as well as internal stakeholder groups.

219. Three coordination mechanisms – state, institutional and market – are present in all higher education systems to different extents. Benchmarking higher education system performance will therefore consider the following three levels of governance:

- **State**: Provincial/state and national arrangements (and supra-national arrangements, such as the European Union) for their higher education systems. State mechanisms include setting goals and strategic aims, systemic coordination and the regulation of the higher education sector. In some systems, the state steers higher education institutions through policy instruments, such as resource allocation, to encourage institutions to adhere to national priorities and objectives.

- **Institutional**: Internal arrangements within higher education institutions determine their values, mission and purposes, their systems of decision-making and resource allocation, the patterns of authority and hierarchy. Decision-making bodies may comprise staff (academic and other staff), students and external representatives (such as employers). In an increasing number of higher education systems, higher education institutions are autonomous and have the freedom to manage their own affairs without interference from the state.

- **Market**: Market mechanisms play a role in influencing higher education systems which engage in market relationships. In these environments higher education institutions are able to compete for students, staff, research income, etc. Students (consumers) are given the freedom to choose a provider and product and providers are given the freedom to enter the market, choose the products to deliver and set their price. Price can influence choice and adequate information on prices and quality is a key factor in systems with market-type mechanisms.

220. The analysis will consider the role of the three steering mechanisms for each system, with a special emphasis on the autonomy of institutions vis-à-vis the state and the degree of marketisation of the system, as the most important state steering mechanisms will be covered in the analysis of policies and implementation mechanisms.

Policies and implementation mechanisms

221. A defining feature of the benchmarking exercise is the analysis of the entire span of performance to understand how government policies drive performance. As such, the analysis will include information on higher education policies and their implementation mechanisms in each country. This will provide a
deep understanding of effective policy development and implementation in higher education, and will allow for policy benchmarking alongside metric benchmarking of higher education system performance.

222. Policy-making plays a crucial role in developing and sustaining efficient education systems. State authorities, through policies and other steering instruments, have the capacity to direct higher education institutions towards meeting national goals and achieving desired outcomes. At the same time, designing and implementing effective policies is a complex process that involves a high degree of coordination between and within education levels and also building consensus between different types of stakeholders.

223. National authorities steer their higher education systems through so-called policy levers, which aim at triggering organizational and academic behaviours through steering mechanisms and institutional arrangements. Building on the work of Hood and Margetts (2007), Howlett (2011), van Vught and de Boer (2015), and applying it in the context of higher education, we classify policy levers based on four types of steering mechanisms: regulation, funding, information and organization.

224. Steering through regulation refers to the government’s capacity to set rules and restrictions on the behaviour of education providers. Policy makers can regulate their higher education systems by adopting or making amendments to legislation, enacting decrees, regulating the admissions process, or setting entry requirements to certain programs. Depending on the level of institutional autonomy and the nature of state steering, regulatory tools can be more substantive – governments directly influence the content of education, or more procedural – state authorities only set guidelines and priorities for higher education and it is the responsibility of institutions to develop strategies that comply with the respective guidelines (Berdahl, 1983). The latter model generally has a strong evaluative component, which, in recent years, has focused less on the inputs and more on the outputs and outcomes of higher education.

225. State officials also make use of financial instruments to influence the behaviour of higher education institutions. Governments, for example, use performance agreements and performance-based funding to reward institutions based on different indicators, such as degrees attained (e.g., in Austria, Finland, the Netherlands), credits earned (e.g., in Denmark), number of PhD graduates (e.g., in Australia, England, Scotland), knowledge transfer activities (e.g., in Australia, Austria, Scotland), and the like (de Boer et al., 2015). State officials can also enhance the equity of education by restructuring the student financial aid system or allocating funds to improve the access to higher education of underrepresented groups or adult learners (e.g., the Higher Education Participation and Partnerships Program in Australia or the Lifelong Learning Accounts for adult learners in the US).

226. Steering through information refers to the role of state authorities in collecting and disseminating information on different aspects of higher education that may be of interest to relevant stakeholders. Governments, for example, can fund initiatives to promote certain fields of study that are short of labour supply, or collect and share data related to graduates’ career progression. The German national ranking system for institutions and programmes – Die Zeit-Ranking, or the Finnish Vipunen (Education Statistics Finland) are example of information-type steering measures.

227. Steering through organisation refers to any policy initiatives that are meant to influence the operational activities of institutions, or for instance the procedures concerned with learning and teaching. Specific measures may refer to establishing career centres inside higher education institutions to facilitate students’ transition to employment (available in most OECD countries), relaxing the rules of transition between and within institutions and programs to promote lifelong learning, or introducing programs targeted to certain groups of learners (e.g., introduction of professional specialization studies for the working population in Finland).
The OECD, in the 2015 study *Education Policy Outlook: Making Reforms Happen*, provides a classification for education policies based on their **scope of intervention**, distinguishing between **comprehensive**, **content-oriented** and **targeted** policies.

**Comprehensive policies** can be national strategies, decrees, universities or polytechnic acts, which serve as frameworks to guide education reforms and prompt change at the system level. Ireland’s National Strategy for Higher Education to 2030 (2011), or New Zealand’s Higher Education Strategy 2014-2019 are some examples of such measures.

**Content policies** are generally set forth to steer the content of knowledge of a specific policy lever, and they can focus, for example, on curriculum development or reforms in qualifications frameworks. Content policies have been implemented in countries like Norway (the 2009 National Qualifications Framework for Higher Education), or in the Flemish community of Belgium (National Qualification’s Structure).

**Targeted policies** are geared towards a specific aspect of a policy lever, such as access, quality assurance or internationalisation (OECD, 2015). The Quality Assurance Agency for Higher Education (2010) in Slovenia, the Quality in Diversity in Higher Education Law in the Netherlands (2013), or the Initiative for Emerging Global University (2014) in Japan serve as examples of targeted policies.

It is worth noting that policies can lead to successful outcomes only when their implementation is followed by efficient and systematic evaluation. Of all policies reviewed in the aforementioned study, only 10% received an evaluation (OECD, 2015). To assess the effectiveness of policy tools and avoid the so-called “implementation gap” (Newton, 2002; OECD, 2008), resulting outcomes must be evaluated against envisaged outcomes. In addition, factors such as policy coherence, credibility of execution, technical and analytical capacity, transparency in reporting and use of results-based data are critical to policy development (OECD, 2015). Lastly, policy evaluation results must be made available and easily accessible to relevant stakeholders. To achieve this, policy makers can establish clear protocols for data reporting and information sharing and also create platforms for discussion on ways to improve policy effectiveness.

**Higher education policy themes**

**Participation in higher education**

- Policies to increase student enrolment in higher education institutions
- Policies to widen participation to traditionally under-represented groups
- Targets for participation, including secondary school-leavers, mature learners, socially or educationally disadvantaged students, or other non-traditional students
Diversification of study provision

- Policies to address the needs of different types of students: traditional students and non-traditional students: part-time students, international students, working students, retired students, etc.
- Policies to align some provision with detected labour-market needs
- Policies to support variation in institutional types, programme offerings, and new modes of delivery
- Policies to support the growth of the non-university sector and private sector involvement, and the quality of these higher education institutions, and the varied student backgrounds they serve
- Policies to support the development of modular courses and other flexible provision
- Regulations on credit transfer and accumulation
- Strategies to improve learning and teaching practices to help academic staff teach a more diverse student population

Funding

- Funding for teaching, research and engagement
- Types of funding mechanism: direct funding to institutions versus funding through students and families
- Types of direct funding to institutions: line-item budgets, block grants, negotiated budget and formula funding
- Targeting of resources to national priorities, performance-based funding, and competitive procedures
- Diversification of funding sources, including cost-sharing policies and tuition fees
- Strategies to assist students cover the costs of their participation, including grants and loans

Accountability

- Policies on mechanisms to demonstrate how well higher education institutions perform towards the mission and responsibilities they have towards taxpayers
- Establishment of quality assurance frameworks
- Performance-based funding and performance contracts
- Participation of external stakeholders in institutions' governing bodies
- Financial audits
- Requirements for publishing information regarding the performance of institutions, in response to general public funding, or funding for specific programmes (justification of expenses)
- Reporting, evaluation, and accreditation schemes

Quality

- Policies on licensing and registration of institutions
- The purposes of quality assurance (accountability versus improvement) and distribution of roles between state agencies and higher education institutions
- Approaches to quality assurance, including accreditation of institutions and/ or study programmes
• Key agencies and stakeholders involved in quality assurance and improvement
• Participation of students in quality assurance and student and graduate surveys
• Measurement of learning outcomes, learning gain, and value-added of higher education

Equity

• Policies regarding equity of access: for instance, open or preferential admission policies, subsidies to underrepresented groups, counselling and guidance services, modification of eligibility requirements for entering higher education, recognition of prior formal and non-formal learning, and general programs or strategies for strengthening the equity of education
• Policies to improve lower levels of education, especially for disadvantaged groups, to increase skills on entry to higher education
• Policies to ensure equity of outcomes

Research and innovation

• Policies to develop research capacity of higher education institutions
• Policies to develop the societal impact of research, namely through knowledge and technology transfer mechanisms
• Policies to develop highly skilled human capital, namely through doctoral education
• Policies to develop collaboration between universities and the outside world of work and society
• Policies to develop research collaboration between institutions, nationally and internationally
• Policies regarding women's participation in science and innovation, including leadership roles

Academic career

• Policies to attract, engage and retain talented staff
• Policies to balance academic freedom with higher education responsibility to contribute to societal goals
• Policies on academic careers, including recruitment, promotion, tenure, work load, salaries, and gender equity
• Policies for staff development

Links to the labour market

• Policies to coordinate the alignment of graduate supply with labour market demand
• Policies to generate public information on graduate destinations, including further study, participation in the labour market, earnings, job mismatch and job quality
• Policies on targeting funding to prioritised study field to address labour market needs
• Policies on including labour market criteria in accreditation of programmes

Life-long learning (LLL)

• Policies to make higher education accessible in all fields at all stages of an individual's lifecycle
• Policies to adjust higher education to fit the needs of adult learners and embed LLL in higher education systems
• Policies to encourage employer-sponsored higher education
• Policies on funding LLL

Internationalisation

• Policies to engage higher education institutions in the global academic environment, including the mobility of students, staff, programmes and institutions
• Policies to integrate an international dimension into the core functions of higher education
• Policies on funding internationalisation initiatives
• Policies on assuring the quality of cross-border higher education
• Policies on attracting skilled migration through international students
• Policies on revenue-generation through international students
• Policies on building the language capacity for internationalisation

Continuing education

• Policies to increase participation rates in adult and continuing education
• Policies to adapt the provision of further education to the needs of the labour market
• Policies to use continuing education to correct systemic deficiencies of lower levels of education
• Policies to use continuing education for the social inclusion of individuals with low skills

Technology transfer and innovation

• Policies to increase the coordination and collaboration between various stakeholders, including higher education actors, technology transfer offices, public officials and private organisations to transfer knowledge and technology from institutions to industry and society
• Policies to increase the incentives for academics and institutions to engage in applied research and experimental development
• Policies on the commercialisation of research, including support for the integration of supply-push and demand-pull models, and the creation of two-way structures between institutions and outside organisations.
• Policies on entrepreneurship education and support for entrepreneurship by academics and students

Social engagement

• Policies to promote the development of civic competences and behaviours in communities to overcome injustice and inequities, eradicate poverty, and advance tolerance, diversity and active citizenship
• Policies to promote the collaboration between institutions of higher education and their larger communities
• Policies to increase the incentive for institutions and academics to become more engaged in their communities
Regional development

- Policies to foster interactions between higher education institutions and different types of regional stakeholders to engage in initiatives for regional development
- Policies to establish higher education institutions in smaller, non-metropolitan areas to reduce geographical imbalances
- Policies to incorporate a regional dimension in evaluation exercises and funding
- Policies to give incentives to academics to participate in regional engagement activities

Other relevant policies for higher education

The policy areas above are not mutually exclusive. In addition there may be areas of policy that are relevant to a higher education system that are not covered in the areas above, and they will be covered.

Regional integration

Regional integration is a feature of some higher education systems, which adds an additional supra-national steering mechanism to the system, which needs to be taken into account in the analysis. Europe has the most developed regional integration process - the Bologna Process - which led to the creation of the European Higher Education Area. Integration has also been occurring regarding research with the creation of the European Research Area.

Other initiatives have occurred in other regions, such as the MERCOSUR and ASEAN, albeit with a more limited scope.

Financial and human resources

Higher education, as other operations, use 'transforming inputs', such as capital and labour, in their production process to transform other inputs, the 'transformed inputs', such as materials, information and people, into outputs, such as products and services (Slack et al., 2012)

In higher education the 'transforming inputs' relate to different expenditures on higher education as well as human resources, which are largely shared across the three functions of higher education (education, research and engagement). Data on these inputs will therefore be presented separately under the framework.

Other inputs, such as students entering higher education, are 'transformed' by the production function of education. There will be other specific inputs to other functions of higher education. Data on these inputs will be organised under the relevant function.

The three functions of higher education

Organising data and information across the stages of performance for each of the three main functions of higher education: education, research and engagement will be useful as they engage in distinct (but sometimes related) activities that result in different outputs and outcomes. Table 2 shows some examples of performance dimensions for education, research and engagement across the stages of performance.
### Table 2. Examples of performance dimensions

<table>
<thead>
<tr>
<th>Stages of performance</th>
<th>Education</th>
<th>Research</th>
<th>Engagement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Input</strong></td>
<td>Access and participation rates</td>
<td>Research active staff</td>
<td>Engagement active staff</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Staff supporting research</td>
<td>Staff supporting engagement</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Staff involved in volunteering</td>
</tr>
<tr>
<td><strong>Activity</strong></td>
<td>Student experience of teaching and learning</td>
<td>Doctoral and postdoctoral research</td>
<td>Consultancy contracts</td>
</tr>
<tr>
<td></td>
<td>The use of technology</td>
<td>Earned income for research projects</td>
<td>Licensing of HEI patents to companies</td>
</tr>
<tr>
<td></td>
<td>Student support</td>
<td></td>
<td>Postgraduate students/postdoctoral researchers directly funded or co-funded by industry/NGOs</td>
</tr>
<tr>
<td></td>
<td>Staff development</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>International education activities and mobility</td>
<td></td>
<td></td>
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<tr>
<td><strong>Output</strong></td>
<td>Progression rates</td>
<td>Publications</td>
<td>Spin-off companies</td>
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<tr>
<td></td>
<td>Attainment rates</td>
<td></td>
<td>Start-up companies</td>
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<tr>
<td></td>
<td>Completion rates</td>
<td></td>
<td>Joint publications with non-academic authors</td>
</tr>
<tr>
<td><strong>Outcome (intermediate)</strong></td>
<td>Skills</td>
<td>Scientific impact</td>
<td>Total earned royalty income</td>
</tr>
<tr>
<td><strong>Outcome (final)</strong></td>
<td>Social outcomes</td>
<td>Social impact</td>
<td>Social impact</td>
</tr>
<tr>
<td></td>
<td>Labour market outcomes</td>
<td>Economic impact</td>
<td>Economic impact</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Innovation</td>
<td>Innovation</td>
</tr>
</tbody>
</table>

### A note on students

241. The highly complex role of the student in higher education needs to be acknowledged. As we have seen previously, the increasing marketization of higher education has sharpened the status of the student as consumer. This is a highly contested status, especially among academia and the student movement who oppose the view of students as consumers on the grounds that it undermines their status as integral active participants in the teaching and learning process (Klemenčič, 2015; Tight, 2013).

242. For the benchmarking process, we acknowledge that the student will play different roles in different stages of the education production function. The student will be an input to the process (i.e. applicants to higher education and students entering higher education), an active co-producer of the teaching and learning process (at the activity stage of the production process), an output in the form of a graduate, and an outcome in the form of a citizen and employee later on.
The benchmarking project will take account of all these facets of the student in higher education: consumer, active participant, and 'transformed input' of the higher education process.

**A note on engagement**

Collecting data on engagement across the span of performance will be challenging due to its heterogeneous character and the fact that this function of higher education systems has been less studied than education and research. As a result, much of the focus of engagement in higher education has been on the processes (or activities) rather than inputs, outputs and outcomes.

Benchmarking higher education system performance will attempt to collect data across the stages of performance (i.e. the inputs, activities, outputs and outcomes) of various aspects of engagement (e.g. continuing education, technology transfer and innovation, and social engagement), but this may prove difficult initially.

However, identification of the areas where data is limited or missing is an important part of the benchmarking higher education system performance process.

**A note on equity**

In order to also assess equity – an important dimension of the effectiveness of higher education systems – indicators will need to be disaggregated by the different characteristics of the student population, such as gender, age, socio-economic background, immigrant status, ethnic minority, etc. in order to assess outcomes for traditionally under-represented groups. As such, the disaggregation of indicators by different student characteristics should be included in each stage of performance.

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CHAPTER 5. BENCHMARKING DATA

248. The data architecture described in Chapter 3 serves as a framework within which consecutive benchmarking exercises can evolve. For the first benchmarking exercise 2017-18, the OECD will be using available comparable international data, and data that already exists at national level for participating countries. Countries will not be requested to collect new data.

249. This chapter provides an overview of the data available for use in the benchmarking exercise 2017-18. The Secretariat will begin collecting the data on countries participating in the benchmarking exercise in early 2017. This will include a request to participating countries at the beginning of 2017 for qualitative background information on their higher education systems and for national or relevant political jurisdiction level data.

250. The Secretariat has mapped a number of OECD and other international data and indicators against the performance dimension framework presented in Chapter 3 to identify what data currently exists. The resulting mapping can be found in Annex 1.

251. When reading the mapping, it should be noted that there will be times when indicators do not sit neatly in one category as they will encompass more than one function of higher education, or different stages of the production process.

252. As a result of the mapping exercise, a number of gaps in the data were identified, i.e. there is no comparable international data for some of the dimensions in the data architecture conceived in Chapter 3.

253. Following from that identification, a benchmarking survey was sent to countries in July 2016, via the Education Policy Committee, to collect information on alternative sources of data at country or relevant political jurisdiction level to address the identified gaps and information on future indicator development. The benchmarking survey can be found in Annex 2.

254. The survey collected information from countries on:

- data available at the relevant political jurisdiction
- data that will become available in the future
- data that countries would like to develop in future in order to support their policy making

255. The results of the survey will inform the decision on what data to use for the 2017-18 benchmarking exercise.

256. The final section of the survey sought information on future indicator development for Indicators of Education Systems (INES) Working Party. The INES Working Party is responsible for setting priorities and standards for data development, analysis and reporting, and providing direction on the dissemination of the INES programme’s policy advice, analysis, and research. The responses to the survey could therefore drive the development of new higher education indicators by the INES Working Party in the future.
Mapping of available OECD and other comparable international data

257. A lot of data on higher education is already collected by the OECD and other international organisations as well as relevant jurisdictions. The Secretariat has been particularly conscious of the importance of ensuring that there is no duplication in data reporting by countries for this project and that it makes best use of available data.

258. The Secretariat has mapped OECD data on context, resources, education, research and engagement to the performance dimension framework to determine what exists within the organisation. Most of the qualitative information on context will be collected from participating countries as background information.

259. A number of OECD Members are also members of the European Union (EU) and/or part of the European Higher Education Area (EHEA) through the Bologna process. Data for the EU and the EHEA is available through Eurostat, the statistical office of the European Union, and the Secretariat has mapped this comparable international data against the performance dimension framework.

260. The European Universities Association (EUA) has developed the University Autonomy Tool to measure institutional autonomy in 29 higher education (university only) systems in 2010. It plans to update information on those systems and possibly add some more. The tool produces detailed information on organisational, financial, staffing and academic autonomy and will provide useful data on the governance of higher education systems for the benchmarking exercise. These indicators have been included in the mapping exercise at Annex 1. The Secretariat proposes using the EUA survey for participating countries which are not covered by the tool.

261. The University Autonomy Tool does not include information on non-university institutions (e.g. universities of applied science or polytechnics). The Secretariat will seek information on the governance arrangements for these institutions from countries.

262. The European Commission and partners from eight European countries have funded a project, E3M: European indicators and ranking methodology for university third mission, which aims to generate a comprehensive instrument to identify, measure, and compare third mission activities, defined as activities that facilitate higher education institutions' engagement with society and industry. A number of indicators on third mission activities have been created through the project. No data is currently systematically collected on these indicators.

Context

263. Data on the economic, social and cultural context of countries will be collected from the most updated OECD fact book (OECD, 2016c).

264. Eurydice provides some data on the structure of the European Education Systems (European Commission/ EACEA/ Eurydice, 2016), but this information is only available for the 38 countries participating in the EU's Erasmus+ programme.

265. The Secretariat has secured the permission from EUA to use the University Autonomy Tool for all countries participating in the benchmarking exercise. This will offer information on how the different higher education systems are steered, namely the ability of institutions to take their own decisions (Estermann et al., 2011).

266. The OECD also has some information on policy and implementation mechanisms in different countries provided by the Education Policy Outlook series (OECD, 2015a).
267. Nevertheless, updated information on the **structure and governance** of higher education and on the **policies and implementation mechanisms** of each country needs to be collected from participating countries in the benchmarking exercise as background information.

**Resources**

268. Data on resources is comprehensively covered by [OECD Education Statistics](http://www.oecd.org/education/), most of which is published in the Education at a Glance (EAG) series (OECD, 2016a).

269. However, there is limited OECD data on private expenditure on higher education other than private household expenditure. Information was sought from countries on other private earned income by the benchmarking survey, such as income from continuing education, technology transfer and innovation, social engagement, and endowments and philanthropic income.

**Education**

270. OECD data on the inputs, outputs and outcomes of the education function is comprehensively covered by [OECD Education Statistics](http://www.oecd.org/education/). In addition, European Union and European Higher Education Area (Bologna Process) statistics ([Eurostat](http://www.eurostat.ec.europa.eu/)) provides added data on education. Nevertheless, some gaps were identified in the mapping exercise, namely on the activities stage of education.

**Equity**

271. There is also a noticeable gap in relation to the necessary disaggregation of indicators to measure equity along the different stages of performance.

272. Currently OECD data in this regard is limited. Some indicators are disaggregated by gender and age, and some by parental education attainment, but there is no systematic study of equity along the stages of performance.

273. The INES Working Party has an on-going project on the development of equity indicators for new entrants and graduates of higher education. One of the diagnosed difficulties of measuring equity is that the groups of interest differ by country. Efforts are under way to agree on new equity indicators comparable across countries.

**Research**

274. Data on research is comprehensively covered by [OECD Science, Technology and R&D Statistics](http://www.oecd.org/), most of which is reported in the OECD Main Science and Technology Indicators and [OECD Science, Technology and Industry Scoreboard series](http://www.oecd.org/). However, a number of gaps were also identified for this function.

275. A key issue with research data is that it will often be impossible to disaggregate the data for the higher education sector from the entire research system. In this case, the research systems will be compared, and all policy analysis will have to take into consideration the role of the higher education system in the research system of each country.

276. Elsevier's Scopus database will be used to calculate snowball metrics for each higher education system, building on the work already done on bibliometrics by the OECD (OECD and SCImago Research...
Group (CSIC), 2016). Snowball metrics are global standards for benchmarking research activities in higher education developed by an academia-industry collaboration (for more information, please see www.snowballmetrics.com).

Engagement

277. Despite an increased interest in engagement, no systematic data is available for this function of higher education, in the OECD or elsewhere.

278. As noted above, indicators developed by the E3M project will be used for the engagement function if possible. The indicators were originally developed for use at institutional level (E3M, n.d.) and a number of these have been adapted for use in this project at the system level (see Annex 1). As there is no OECD data on these indicators, information was sought on existing data at country level by the benchmarking survey, using the E3M indicator framework.

Gaps in the data

279. The data mapping exercise shows that there is no internationally comparable data on a number of performance dimensions in areas of interest to policy makers.

280. As mentioned above, the benchmarking project will take advantage of data from alternative sources such as the European Union and on countries participating in the European Higher Education Area to address some of these gaps.

281. Countries collect a lot of similar data on their higher education systems which could be used for the benchmarking project. A survey was sent to countries in 2016 on the availability of information and data at country level that could address the identified gaps, and possibly be used in the benchmarking project.

282. Data collected by countries will not be standardised, as OECD data is. This will be taken into account when using the data, and the necessary caveats identified.

283. Identified gaps in the data will also feed into the process for developing additional indicators for tertiary education through the INES Working Party and its networks.

Survey on data available at country level

284. The benchmarking survey was made up of three parts, and responses were completed at the relevant political jurisdiction, i.e. at the national level or, in the case of some federal systems, at the state or provincial level.

Part I - Information on equity indicators availability

285. As seen in Chapter 2, one of the most pressing concerns on higher education performance is that of equity. The equity dimension is cross-cutting to indicators at all stages of performance in higher education, from input to outcome. To account for equity, indicators need to be disaggregated by groups of students with different relevant characteristics, such as: socio-economic background, ethnicity, migrant status, disability, gender, age, previous education, geographic origin, school leaver vs mature student, campus based vs off-campus, and hours worked by students.
286. In Part I, countries were asked to provide the Secretariat with information on which mapped indicators they have disaggregated data by different groups of people in order to assess equity. They were also asked to state by which characteristics of students they are disaggregated by.

**Part II - Information on indicator data availability**

287. Part II of the survey sought information from countries on whether they have national data that can address the identified gaps in the data.

288. When data is available at the relevant political jurisdiction, the survey collects information on:

- whether data on the indicator is available in the responding country;
- at what relevant political jurisdiction;
- the date of the most recent available indicator data;
- for how long the data has been collected;
- the document or URL that describes the data.

289. In addition to information on available data, the survey also sought information on data that is not currently available but is either under development or planned. In that case, similar details on the data are requested: relevant political jurisdiction, date the data will become available and the document or URL that describes the data.

290. Countries were also asked to indicate interest in having data on mapped indicators that they do not currently have the data for.

**Part III - INES Working Party - Information on future indicator development**

291. In order to help inform future tertiary education indicator development, the INES Working Party sought advice from countries on where they would like to develop new indicators to support policy development and implementation.

**Results of the benchmarking survey**

292. All EDPC countries, plus other members of the INES Working Party, were invited to answer the benchmarking survey. As of 22 December 2016, 18 out of 36 countries have responded: twelve from Europe, three from America, and three from Asia and Oceania.

293. The countries that have responded to the survey are: Austria (AUT), Belgium – Flanders (BEL Flanders), Brazil (BRA), Canada (CAN), the Czech Republic (CZE), Germany (DEU), Denmark (DNK), Estonia (EST), Japan (JPN), Korea (KOR), Latvia (LVA), Luxembourg (LUX), the Netherlands (NLD), Norway (NOR), New Zealand (NZL), Poland (POL), the Slovak Republic (SVK), and the USA.

**Part I – Information on equity indicators availability**

294. Not all responding countries answered Part 1 of the survey with the same degree of completeness. While the majority of the countries reported on the availability of disaggregated data for most of the indicators mapped, four provided an overall generic answer (Estonia, Denmark, the Netherlands and
Norway), and four did not complete this section of the questionnaire (Austria, Germany, Korea, Luxembourg, and the Slovak Republic)¹.

295. Estonia indicated that student indicators can be disaggregated by a wide set of variables including gender, age, citizenship, country of residence, licence for permanent living, special needs, curriculum, field of study, broad group of studies, educational institution, language of instruction, form of study, study load, source of financing, ISCED level, date of enrolment, qualification/education level at the moment of enrolment, nominal length of study, date of leaving the programme/institution/system, reason for leaving. Estonia also gathers data on gender, age, job position, workload and qualification of the teaching staff in tertiary education. Disaggregated data on other staff are not available.

296. Denmark reported on the availability of a register containing individual student data such as age, gender, migrant status and parental education.

297. Relevant disaggregation for the Netherlands is parents’ educational attainment and parents’ income, students’ immigrant status, ethnicity, gender, work status, and disability. Most of the statistics on equity are available for national students only or for the total population of students (both national and international students); exceptions are students’ gender, ethnicity and age.

298. Norway stated that, in general terms, indicators can be disaggregated by most of the proposed groupings in the survey, with the exception of migration status and disability.

299. Brazil, Denmark, the Netherlands, and New Zealand referred to the results of the INES WP survey on the national preferences and data availability on equity in tertiary education [EDU/EDPC/INES/WP(2016)19]. Though similar in scope, the two surveys have different characteristics.

- The benchmarking survey has a wider scope than the INES survey which focused on three specific education variables: entrants (input variable), graduates (output variable), and attainment (outcome variable). The benchmarking survey is based on the data architecture described in Chapter 3 and maps 160 education variables covering four dimensions: input (Access & participation; 24 variables), activity (Student experience & student support, Staff development; 37 variables), output (Attainment, Completion; 25 variables), and outcome (Skills outcomes, Labour market outcomes, Social outcomes; 74 variables).

- The two surveys use different approaches to identify the breakdowns for which data are most often available. The countries answering the INES WP survey had to choose from a pre-defined set of disaggregation variables specifying, for each of them, the degree of relevance (i.e. not relevant, relevant, highly relevant). Countries responding to the benchmarking survey were free to indicate the disaggregation characteristics for which data are available.

- The benchmarking survey is wider in terms of dimensions covered while the INES WP survey is deeper on specific areas.

- The two surveys also have different purposes. The benchmarking survey aims to identify data already available at a national level that could be used in the benchmarking exercise 2017-18. The INES WP survey aims to support the development of equity indicators in tertiary education.

¹ Austria and Korea answered Part I providing general information on data availability rather than on their disaggregation.
This work will support subsequent benchmarking exercises, by providing international comparable indicators of equity.

For the countries that provided complete answers to the first part of the benchmarking survey, 75% of the selected indicators (140 out of 160) are disaggregated by at least one country and a core of 18 indicators is disaggregated by six or more countries (see Table 3). The full list of indicators with the associated number of countries disaggregating them is reported in Table A1 in Annex 3.
Table 3. Indicators most frequently used to assess equity

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Type</th>
<th>Number of countries disaggregating it</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of students in short-cycle tertiary, bachelor’s and master’s programmes, and total tertiary, by intensity of study and gender</td>
<td>Input</td>
<td>6</td>
</tr>
<tr>
<td>Distribution of international and foreign students enrolled in tertiary programs, by field of education</td>
<td>Input</td>
<td>6</td>
</tr>
<tr>
<td>Distribution of international and foreign students in tertiary education, by country of origin</td>
<td>Input</td>
<td>6</td>
</tr>
<tr>
<td>Expected demographic changes within the youth population aged 15-19 and 20-29 over the next decade</td>
<td>Input</td>
<td>7</td>
</tr>
<tr>
<td>Tertiary education participation</td>
<td>Input</td>
<td>7</td>
</tr>
<tr>
<td>Distribution of students enrolled at tertiary education levels by sex and field of education</td>
<td>Input</td>
<td>8</td>
</tr>
<tr>
<td>Gender distribution of teachers</td>
<td>Activity</td>
<td>6</td>
</tr>
<tr>
<td>Distribution of all tertiary graduates, by field of education</td>
<td>Output</td>
<td>6</td>
</tr>
<tr>
<td>Percentage of all students and international students who graduate from sciences and engineering programmes, by tertiary ISCED level</td>
<td>Output</td>
<td>6</td>
</tr>
<tr>
<td>Graduates at doctoral level, in science, math, computing, engineering, manufacturing, construction, by sex – per 1000 of population aged 25-34</td>
<td>Output</td>
<td>6</td>
</tr>
<tr>
<td>Graduates in ISCED 5 and 6 by age and sex</td>
<td>Output</td>
<td>7</td>
</tr>
<tr>
<td>Science and technology graduates by sex</td>
<td>Output</td>
<td>7</td>
</tr>
<tr>
<td>Distribution of graduates at education level and programme orientation by sex and field of education</td>
<td>Output</td>
<td>7</td>
</tr>
<tr>
<td>Mathematics, science and technology enrolments and graduates</td>
<td>Output</td>
<td>7</td>
</tr>
<tr>
<td>Tertiary education graduates</td>
<td>Output</td>
<td>8</td>
</tr>
<tr>
<td>Temporary employees by sex, age and educational attainment level</td>
<td>Outcome</td>
<td>6</td>
</tr>
<tr>
<td>Full-time and part-time employment by sex, age and educational attainment</td>
<td>Outcome</td>
<td>6</td>
</tr>
<tr>
<td>Self-employment by sex, age and educational attainment level</td>
<td>Outcome</td>
<td>6</td>
</tr>
</tbody>
</table>

301. Figure 30 depicts the share of indicators disaggregated by each country. For a given country, the bar represents the percentage of the overall number of indicators broken down to assess equity, while the markers refer to the quota of indicators disaggregated within a specific domain (i.e. input, activity, output and outcome). Average values correspond to the arithmetic mean of the country results.
Depending on the country considered, the overall share of disaggregated indicators ranges between 4-5% (NZL and JPN) and 52-53% (CZE and POL), with an average of 29%. In general, information collected confirms that governments are particularly aware of equity issues related to access and participation in higher education (input indicators) as well as to attainment and completion of higher education (output indicators). Activity and outcome indicators are less likely to be broken down in order to assess equity issues.

As shown in Figure 30, on average, disaggregated data is available for 55% of the output indicators (min. 0% in JPN and max. 92% in POL), 42% of the input indicators (min. 8% in JPN and max. 67% in CZE and LVA), 23% of the activity indicators (min. 0% in BEL-Flanders and NZL and max. 51% in POL), and 19% of the outcome indicators (min. 0% in BEL-Flanders and NZL and 51% in CZE).

Gender and age are the most widely used characteristics to disaggregate the indicators. In a limited number of countries, some of the indicators are also disaggregated by variables such as ethnicity, region and migration status (BEL-Flanders, BRA, CAN, NZL, and the USA) (see Table 4).
Equity issues related to disability and students’ socio-economic status seem to be particularly relevant in Canada (16 and 15 indicators are broken down by these variables, respectively); in addition, in Latvia a significant number of indicators are disaggregated by ISCED level (10), type of higher education institution (31), field of study (16), and intensity of study (23). Finally, previous education and working status/occupation are relevant disaggregating factors in Belgium – Flanders (23 and 25 indicators are stratified by these variables, respectively).

Table 4. Number of indicators by type of disaggregating factor and country

<table>
<thead>
<tr>
<th>Disaggregating factor</th>
<th>BEL-Flanders</th>
<th>BRA</th>
<th>CAN</th>
<th>CZE</th>
<th>JPN</th>
<th>LVA</th>
<th>NZL</th>
<th>POL</th>
<th>USA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>25</td>
<td>58</td>
<td>29</td>
<td>83</td>
<td>2</td>
<td>32</td>
<td>9</td>
<td>17</td>
<td>56</td>
</tr>
<tr>
<td>Age</td>
<td>25</td>
<td>56</td>
<td>9</td>
<td>77</td>
<td>1</td>
<td>13</td>
<td>9</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>25</td>
<td>40</td>
<td>25</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>7</td>
<td>4</td>
<td>53</td>
</tr>
<tr>
<td>Region/country of origin</td>
<td>48</td>
<td>15</td>
<td>89</td>
<td>0</td>
<td>6</td>
<td>100</td>
<td>14</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

Part II – Information on indicator data availability

All responding countries but New Zealand (17) answered Part II, and the overall degree of completeness of the questionnaires is satisfactory.

The information provided shows that, in addition to internationally comparable data, countries collect a significant amount of national data. In particular, from the 172 indicators listed in Part II, a subset of 24 indicators appears particularly common. These indicators, collected in at least 11 of the 16 countries answering this section, are listed in Table 5 (Table A2 in Annex 3 presents the results of this analysis for all the indicators).

Table 5 suggests that most of the data available at the national level refers to the education dimension. The results presented in Table 6 confirm and complement this conclusion.
Table 5. Most common indicators for which national data are available

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Dimension</th>
<th>Number of countries for which national data are available</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expected demographic changes within the youth population aged 15-19 and 20-29 over the next decade (2005-2015)</td>
<td>Education</td>
<td>15</td>
</tr>
<tr>
<td>Tertiary education participation</td>
<td>Education</td>
<td>14</td>
</tr>
<tr>
<td>Distribution of students enrolled at tertiary education levels by sex and field of education</td>
<td>Education</td>
<td>14</td>
</tr>
<tr>
<td>Tertiary education graduates</td>
<td>Education</td>
<td>14</td>
</tr>
<tr>
<td>Graduates in ISCED 5 and 6 by age and sex</td>
<td>Education</td>
<td>14</td>
</tr>
<tr>
<td>Science and technology graduates by sex</td>
<td>Education</td>
<td>14</td>
</tr>
<tr>
<td>Age distribution of teachers</td>
<td>Education</td>
<td>13</td>
</tr>
<tr>
<td>Graduates at doctoral level, in science, math, computing, engineering, manufacturing, construction, by sex – per 1000 of population aged 25-34</td>
<td>Education</td>
<td>13</td>
</tr>
<tr>
<td>Graduates in tertiary education, in science, math, computing, engineering, manufacturing, construction, by sex – per 1000 of population aged 20-29</td>
<td>Education</td>
<td>13</td>
</tr>
<tr>
<td>Distribution of graduates at education level and programme orientation by sex and field of education</td>
<td>Education</td>
<td>13</td>
</tr>
<tr>
<td>Mathematics, science and technology enrolments and graduates</td>
<td>Education</td>
<td>13</td>
</tr>
<tr>
<td>Temporary employees by sex, age and educational attainment</td>
<td>Education</td>
<td>13</td>
</tr>
<tr>
<td>Full-time and part-time employment by sex, age and educational attainment</td>
<td>Education</td>
<td>13</td>
</tr>
<tr>
<td>Pupils and students enrolled by education level and programme orientation with coverage adjusted to statistics on educational finance and aligned to financial year</td>
<td>Education</td>
<td>12</td>
</tr>
<tr>
<td>Classroom teachers and academic staff by education level, programme orientation, sex, type of institution and employment status</td>
<td>Education</td>
<td>12</td>
</tr>
<tr>
<td>Classroom teachers and academic staff by education level, programme orientation, sex and age groups</td>
<td>Education</td>
<td>12</td>
</tr>
<tr>
<td>Proportion of students that start tertiary education and leave with a degree in the modal time</td>
<td>Education</td>
<td>12</td>
</tr>
<tr>
<td>Average time to complete a bachelor, master’s and doctorate</td>
<td>Education</td>
<td>12</td>
</tr>
<tr>
<td>Self-employment by sex, age and educational attainment level</td>
<td>Education</td>
<td>12</td>
</tr>
<tr>
<td>Distribution of academic staff at education level by age group</td>
<td>Education</td>
<td>11</td>
</tr>
<tr>
<td>Percentage of full time vs part-time staff</td>
<td>Education</td>
<td>11</td>
</tr>
<tr>
<td>Approaches to student support</td>
<td>Education</td>
<td>11</td>
</tr>
<tr>
<td>Student mobility</td>
<td>Education</td>
<td>11</td>
</tr>
<tr>
<td>Proportion of students that start tertiary education and leave without a degree</td>
<td>Education</td>
<td>11</td>
</tr>
</tbody>
</table>
As shown in Table 6, the number of indicators for which national data is available vary significantly across countries: it is above 50 in Luxembourg, Austria, Norway, Poland, and Belgium–Flanders; between 30 and 50 in Estonia, the USA, Latvia, Korea, Canada, and Japan; between 20 and 30 in Brazil, Germany, Denmark, the Czech Republic; below 20 in the Netherlands and the Slovak Republic.

All responding countries collect national data related to the education dimension which, depending on the country considered, covers between 50% (LUX) and 95-100% (BRA, DEU, SVK and USA) of the data available at the national level.

<table>
<thead>
<tr>
<th>Country</th>
<th>Total</th>
<th>Resources</th>
<th>Education</th>
<th>Research</th>
<th>Engagement</th>
</tr>
</thead>
<tbody>
<tr>
<td>LUX</td>
<td>83</td>
<td>4</td>
<td>43</td>
<td>2</td>
<td>34</td>
</tr>
<tr>
<td>AUT</td>
<td>62</td>
<td>48</td>
<td>6</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>NOR</td>
<td>60</td>
<td>3</td>
<td>40</td>
<td>4</td>
<td>13</td>
</tr>
<tr>
<td>POL</td>
<td>60</td>
<td>43</td>
<td>9</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>BEL (Flanders)</td>
<td>59</td>
<td>38</td>
<td>10</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>EST</td>
<td>49</td>
<td>44</td>
<td>1</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>USA</td>
<td>47</td>
<td>45</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LVA</td>
<td>42</td>
<td>32</td>
<td>8</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>KOR</td>
<td>36</td>
<td>34</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAN</td>
<td>35</td>
<td>1</td>
<td>32</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>JPN</td>
<td>34</td>
<td>25</td>
<td>1</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>BRA</td>
<td>29</td>
<td>28</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DEU</td>
<td>28</td>
<td>28</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DNK</td>
<td>23</td>
<td>2</td>
<td>13</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>CZE</td>
<td>21</td>
<td>21</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NLD</td>
<td>11</td>
<td>9</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SVK</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Countries are reported in descending order with respect to the total number of national indicators, regardless of the dimension they belong to.

All countries but the Czech Republic, Germany and the Slovak Republic report having national data on the research dimension. Nevertheless, only in 5 countries (namely, POL, BEL-Flanders, NLD, LVA, and especially DNK), these indicators amount to more than 10% of the overall number of indicators for which national data are available.

Fewer countries report collecting national data on the engagement and on the resources dimensions. In particular, national indicators on engagement are available in 8 out of 17 countries and they represent more than 20% of these indicators in Norway (21.7%), Japan (23.6%), and Luxembourg (41.0%). National data on the resources dimension are much scarcer and are available only in Luxembourg, Norway, Canada, and Denmark.
Generally, national data refers to the country as a whole. Yet, some countries have indicators both at the national and at the subnational level. This is the case of Belgium – Flanders, Brazil (Provinces), Germany (Federal Länder), and the USA (States). Interestingly, some indicators in Belgium – Flanders and Denmark are only available at the sub-national level (23 and 2 indicators, respectively); in Brazil, Germany, and the USA all the subnational indicators are aggregated at the national level (Table 7).

Table 7. Number of indicators for which national data are available by political jurisdiction

<table>
<thead>
<tr>
<th>Country</th>
<th>Total</th>
<th>Nation</th>
<th>Sub-nation</th>
<th>Only sub-nation</th>
<th>Not stated</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUT*</td>
<td>62</td>
<td></td>
<td></td>
<td></td>
<td>62</td>
</tr>
<tr>
<td>BEL (Flanders)</td>
<td>59</td>
<td>36</td>
<td>46</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>BRA</td>
<td>29</td>
<td>29</td>
<td>29</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAN</td>
<td>35</td>
<td>35</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CZE</td>
<td>21</td>
<td>21</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DEU</td>
<td>28</td>
<td>26</td>
<td>22</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>DNK</td>
<td>23</td>
<td>19</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>EST</td>
<td>49</td>
<td>49</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>JPN</td>
<td>34</td>
<td>33</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>KOR*</td>
<td>36</td>
<td>36</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LUX</td>
<td>83</td>
<td>83</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LVA</td>
<td>42</td>
<td>40</td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>NLD</td>
<td>11</td>
<td>8</td>
<td></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>NOR</td>
<td>60</td>
<td>56</td>
<td></td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>POL</td>
<td>60</td>
<td>36</td>
<td></td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>SVK*</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>USA</td>
<td>47</td>
<td>47</td>
<td>47</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* AUT, KOR and SVK did not provide this information.

The survey asked countries to indicate the most recent year of reference of the indicators for which they collect national data. Limiting the analysis to the subset of indicators for which this information is available and for which national data are collected in at least one responding country (115), the answers provided reveal that the most recent year of reference ranges between 2012 and 2016 in almost 60% of the cases (58.3%). However, this homogeneity is only apparent: in a substantial number of indicators (32) the most recent year of reference varies consistently across countries (i.e., for these indicators, the cross-country difference in the most recent year of publication is equal to 10 or more years) (for details see Table A3 in Annex 3).

Nine out of seventeen responding countries stated that they are developing or planning to develop some of the indicators for which data are not currently available:
Brazil and Estonia are developing indicators on the student learning experience and student support (four and two, respectively).

Canada is evaluating the feasibility of collecting data on five indicators on higher education staff (age distribution of teachers; classroom teachers and academic staff by education level, programme orientation, sex, type of institution and employment status; classroom teachers and academic staff by education level, programme orientation, sex and age groups; distribution of academic staff at education level by age group; percentage of academic staff per education level – bachelor’s, master's, doctorate).

Denmark is planning to have an indicator on the proportion of female researchers in higher education.

Latvia is considering developing indicators covering a wide range of dimensions (one on resources, two on higher education staff development, one on completion, more than thirty indicators in the area of engagement, and indicators on post-doctoral research).

Luxembourg is developing indicators on social engagement, career guidance, the role of internships in education, student satisfaction, pedagogic training of academic staff, tertiary education drop-out, brain drain, spin-offs and start-ups, creative projects involving higher education staff, and joint publications with non-academic authors.

The Netherlands is setting up a new data collection to examine equity issues related to participation in education and training.

Norway is working on an indicator to capture the satisfaction of employers with higher education graduates.

Japan reported that two indicators concerning social engagement (namely social engagement as a mission of higher education and social engagement included in national policies for higher education) have been discussed in the Central Education Council and that the related laws have been amended.

Three countries reported being interested in the future collection of data on indicators for which data are currently unavailable:

- The Netherlands and Luxembug are interested in developing three indicators on the role of technology in higher education.
- Poland is interested in having four indicators on resources and one on skills match.
- Luxembug is planning to have two indicators on academic staff (including doctoral students) mobility, an indicator on the command of foreign languages, and an indicator on the proportion of female researchers in academia.

Part III - INES Working Party - Information on future indicator development

Canada and Luxembug were the only countries that provided information on their interest in collaborating with the INES WP on the future development of indicators on tertiary education.

Canada is particularly interested in indicators on the issue of multi-credentials and on the provision of education and training to older adults.
Luxemburg is interested in collaborating with the INES WP on developing indicators to identify the first and second foreign language spoken by higher education students and graduates.

REFERENCES


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