



Universities UK
International

The UK-Japan relationship: collaboration in higher education, research and innovation



1. Introduction

The UK and Japan have diverse, high-quality higher education systems that foster international collaboration in science and research. Both countries are global research and innovation powerhouses and share a strong bilateral relationship, developed through direct collaboration, inter-institutional partnerships and, more rarely, by consortia of institutions.

In October 2020, the UK and Japan signed the UK Japan Comprehensive Economic Partnership Agreement². As such, Japan was the first nation to sign a significant trade deal with the UK as an independent trading nation. The agreement demonstrates both industries.

In recent years, a key goal for UK science and innovation has been to strengthen and diversify its international partnerships. Science, research and innovation also feature -Covid socioeconomic recovery plan and strategy for future international engagement.³

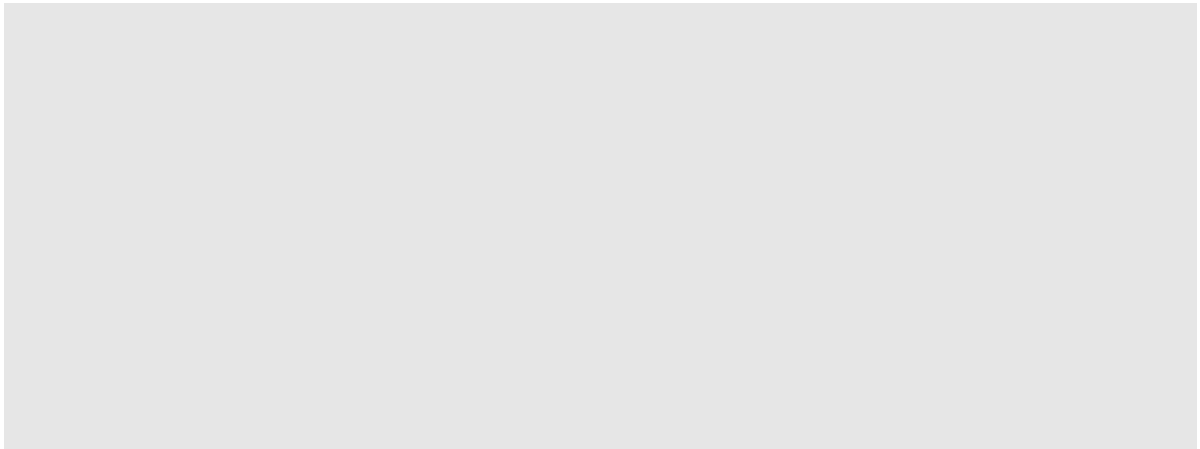
Meanwhile, Japan continues to diversify its academic body, attract more international students, and further develop international cooperation in science and research.⁴ The current policy environment in both countries favours innovation and investment in international cooperation.

University collaboration is a driving force for sustainable and effective partnerships between nations in science, research, and innovation. This report assesses the current levels of research collaboration between the UK and Japan and suggests future opportunities for cooperation between the two countries.

The first section outlines the characteristics of the Japanese higher education system. The second assesses the research and innovation landscape in both Japan and the UK.

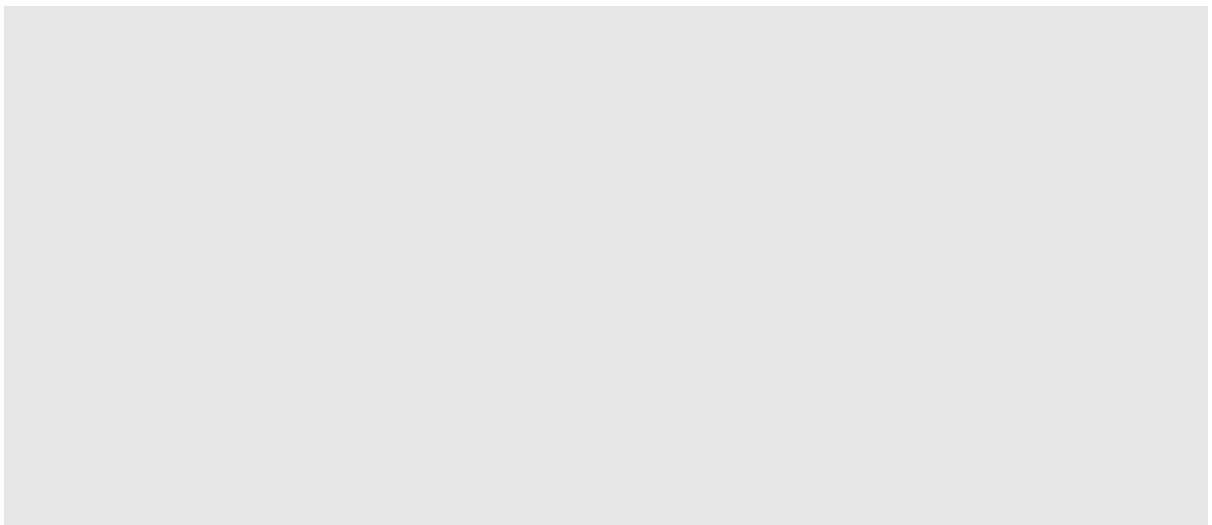
2. Higher education and research in Japan: an overview

FIGURE 1: TERTIARY-LEVEL INSTITUTIONS IN JAPAN



Source: [World Education News and Reviews](#), Education in Japan, 18 February 2021

FIGURE 2: TYPES OF QUALIFICATION IN JAPAN



Source: [Higher Education System in Japan](#)

Japan has a large and high-quality higher education sector. In 2021

years. A decline in enrolment figures is anticipated to have significant implications for the higher education sector.

The Japanese government has set a target to double the number of Japanese students studying abroad from 60,000 in 2010 to 120,000 by 2020. However, overall outward student mobility remains relatively limited. According to the Ministry of Education, Culture, Sports, Science and Technology (MEXT) Survey on the Number of Japanese Studying Abroad,⁷ the number of Japanese students studying abroad was 77,953 in 2019.⁸ This represents a contraction from 2018, when an estimated 80,556 students studied abroad. The numbers saw a further unprecedented contraction due to Covid-19 in 2020, dropping to just 18,374.

The late 2020 MEXT International Students Survey shows that in 2020 there were 279,597 international students⁹ studying in Japan in all types of courses, at all levels of study.¹⁰ This represents a 10.4% decrease from 2019, when 312,214 international students studied in Japan.¹¹

2.2 Regulation of higher education

The Japanese government regulates higher education through the Ministry of Education, Culture, Sports, Science and Technology (MEXT). In the case of private institutions, the minister seeks advice from the Council for University Chartering and School Corporation, established within MEXT, which reviews the quality of institutions based on the

2.3 Funding for higher education

of public expenditure on higher education relative to the size of the total economy. The Japanese Government, through MEXT, contributes to the public funding of higher education institutions through several channels, including institutional and non-institutional funding. The overall share of public expenditure on higher education institutions, 1.6% in 2018, was one of the lowest in the OECD¹². This figure as a percentage of GDP in Japan equates to 0.4%.¹³

Private expenditure is the main source of funding for the Japanese higher education sector. The share of private expenditure on higher education, reaching 68% in 2018, is among the highest in the OECD¹⁴. This figure as a percentage of GDP equates to 0.9%.¹⁵

programme across OECD countries. In Japan, the average debt a student has upon graduation is JPY 3,673,684 (GBP 21,951).¹⁶

While public expenditure on higher education is limited, education (at all levels) and science jointly receive one of the largest budgets of the national government's general account, with total expenditure reaching JPY6.8 trillion in 2021, representing 5.4% of total government spending.¹⁷

2.4 Funding agencies

The primary funding agencies for R&D in Japan are the Japan Society for Promotion of Science (JSPS), Japan Science and Technology Agency (JST), Japan Agency for Medical Research and Development (AMED) and New Energy and Industrial Technology Development Organization (NEDO).

¹² OECD, Education at a Glance 2021, available at: Education at a Glance, 2021 [What is the total public spending on education? | Education at a Glance 2021: OECD Indicators | OECD iLibrary \(oecd-ilibrary.org\)](https://www.oecd-ilibrary.org/education/education-at-a-glance-2021)

¹³ <https://www.statista.com/statistics/707557/higher-education-spending-share-gdp/>

¹⁴ <https://data.oecd.org/eduresource/private-spending-on-education.htm>

¹⁵ <https://www.statista.com/statistics/707557/higher-education-spending-share-gdp/>

¹⁶ OECD, Education at a Glance 2020, p.293, available at: [OECD iLibrary | Education at a Glance 2019: OECD Indicators \(oecd-ilibrary.org\)](https://www.oecd-ilibrary.org/education/education-at-a-glance-2020)

¹⁷ This budget focuses on the promotion of culture, education and science in Japan. More details: <https://www.mof.go.jp/english/policy/budget/budget/fy2021/02.pdf>



2.5 Recent higher education and research policy reforms

Over the past three decades, the Japanese Government has been focussing on improving the quality, diversity, and impact of higher education through the implementation of internationalisation policies. One of the first efforts to attract

19

Policies such as the Inter-University Exchange Project (Reinventing Japan Project), the Project for Promotion of Human Resources Development, and the Global 30 Project Establishing University Network for Internationalization, were among the internationalisation initiatives that ran in 2011 and 2012.

Since 2012, the Japanese Government has introduced a number of internationalisation

international experiences, develop international student exchange programmes, and incentivise foreign researchers and academics to join Japanese institutions.²⁰ Some of these are de()18(a)-7(r)12(e)-5()-2(de)14(()18(a)TJET0 1 35A()-2d8(e)15(s5A()-2)-8(n)8(n)w0 595.25 84



3. Research and innovation in Japan and the UK: a comparative overview

3.1 Total expenditure on Research and Development

TABLE 1: COMPARATIVE VIEW OF JAPAN AND UK RESEARCH LANDSCAPE: EXPENDITURE ON R&D (2019)

	Japan	UK
Gross expenditure on R&D (GERD)	GBP 122 billion/ JPY 19.6 trillion	GBP 38.5 billion/ JPY 6.2 trillion
Domestic GERD (as % of GDP)	3.24	1.76
Business GERD (as % of GDP)	2.59	0.95
Government GERD (as % of GDP)	0.48	0.45

Source: OECD Main Science and Technology Indicators, vol. 2020, issue 2, available at:

<https://www.oecd.org/sti/msti.htm>

R&D is a priority area for public funding for both the UK and Japan. According to the Japan Statistics Bureau, in FY ³²2020

industry and the automotive manufacturing industry, spending GBP 4.8 billion (JPY 771 billion) and GBP 3.4 billion (JPY 547 billion), respectively (Figure 6).³⁶

In March 2022, the Department of Business, Energy and Industrial Strategy (BEIS) in the UK announced the largest ever research and development budget, worth GBP 39.5 billion over the period 2022-2025. It aims to support the g science superpower, and delivery of the Innovation Strategy.³⁷

FIGURE 6: TOP 10 BUSINESS SECTORS IN TERMS OF R&D EXPENDITURE IN THE UK, 2019

Source: Research & Development Spending, Briefing Paper, UK House of Commons, 16 March 2021

FIGURE 7: UK DOMESTIC GROSS EXPENDITURE ON R&D BY FUNDING SECTOR IN CONSTANT PRICES, 2014-2019

Source: Office for National Statistics, [Gross Domestic Expenditure on research and development, UK, 2018](#), accessed 7 June 2021.

3.2 Numbers of researchers

TABLE 2:

According to the OECD, there were 689,889 full-time researchers (in academia and industry) in Japan in 2020, up from 678,134 in 2018.³⁸

While the vast majority academics and researchers in tertiary-level institutions are Japanese, efforts to internationalise the academic and research body are increasing. In 2020, 34,678 foreign researchers came to Japan for medium- to long-term research.³⁹ If short-term researchers are added, then there was a total of 34,678 inbound researchers that year, down 4,646 from the previous year, due to the impact of the Covid-19 pandemic at the end of the 2019 fiscal year (early 2020).⁴⁰

In the UK, international academic staff and researchers have traditionally formed a large proportion of the total numbers of researchers. In 2019 there were 316,295 full-time researchers, up from an estimated 305,795 in 2018.⁴¹ In the 2019–20 academic year, 35.6% of all academic staff at UK institutions were carrying out research functions, and 36.6% of all academic research staff were international.⁴²

3.3 Output and publication quality

TABLE 3: RESEARCH OUTPUTS AND PERFORMANCE METRICS IN JAPAN AND UK

	Japan	UK
Total research outputs, 2016-2021*	831,994	
Share of research outputs among most highly cited, 2016–2021 (%)*	8.1	16.5

Over the last ten years, research output from Japanese authors has grown steadily,⁴³ reaching 831,994 publications in the 2016

The domestic workforce is highly educated and includes a substantial proportion of researchers, ranking ninth globally.⁴⁹ Japanese research has a noticeable impact on the economy and industry, with over 10,000 patents citing scholarly output published in Japan between 2017 and 2021.

FIGURE 8: Country comparison by citation impact (FWCI) 2007-2020

The UK produces world-leading research, known for its high quality, integrity and international collaboration. The UK's unweighted citation impact has been ranked first in the G7 every year since 2007, varying between 1.2 and 1.6. \ publications in 2020, 16.2% were produced in the UK.⁵⁰

international partner, reaching 58% in 2019-20. This makes the UK the second most internationally collaborative country in the G7, after France, and is significantly higher than the OECD average.⁵¹ The yM international sectors and industries and affects social and economic development.

4. Japan

Australia	12,888	3.78
South Korea	11,608	2.85
Italy	11,055	4.22
Canada	10,860	4.05
Spain	8,345	4.81

Source: SciVal® database, accessed 09 June 2022

4.2 Research mobility

U-Exchange⁵³ provides data on incoming and outbound mobile academic researchers in Japan between 1997 and 2017. It demonstrates that over the past 30 years, Japanese researchers have been increasingly active internationally.

4.2.1 Outbound mobility

The total number of outbound mobile Japanese researchers in 2017 was 174,602, up 24.1% from 140,731 in 2010.

By the Kōho Institutional Program for Young Researcher Overseas Visits,⁵⁴ there has been a temporary rise in the number of outbound mobile scholars. However, overall numbers of mid- to long-term mobile researchers going to North America and Asia have declined slightly over the past five years.

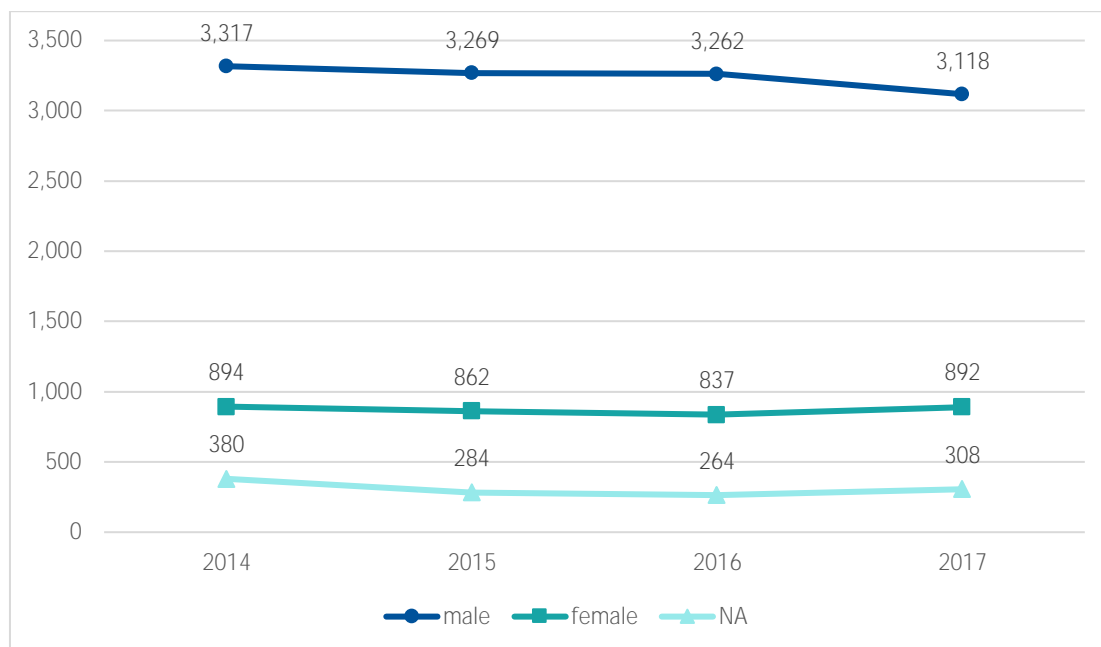
Where do Japanese researchers go?

Since 2002, the most popular destinations for Japanese researchers have been the US, Taiwan, China, South Korea, the UK and Germany (although not always in this order).

⁵³ MEXT, Survey of Researcher Exchanges, 2019.

⁵⁴ <https://www.jsps.go.jp/english/e-daikokai/index.html>

FIGURE 10: NUMBERS OF OUTBOUND MOBILE RESEARCHERS BY GENDER (MEDIUM- AND LONG-TERM MOBILE RESEARCHERS), 2014-2017



Source: MEXT, [2019 Survey of Researcher Exchanges](#)

4.2.2 Inbound mobility

In 2017, the total number of inbound mobile international researchers was 39,473, up 5.4% from 37,453 in 2010.

Where do international researchers come from?

The largest cohorts of inbound mobile researchers come from the USA, China, South Korea, UK, France and Taiwan.

5.2 UK-Japan research output

The UK Japanese partnership produces high-quality scientific outputs. Although in

5.3 Japan-UK mobility

5.3.1 Japanese students in UK institutions

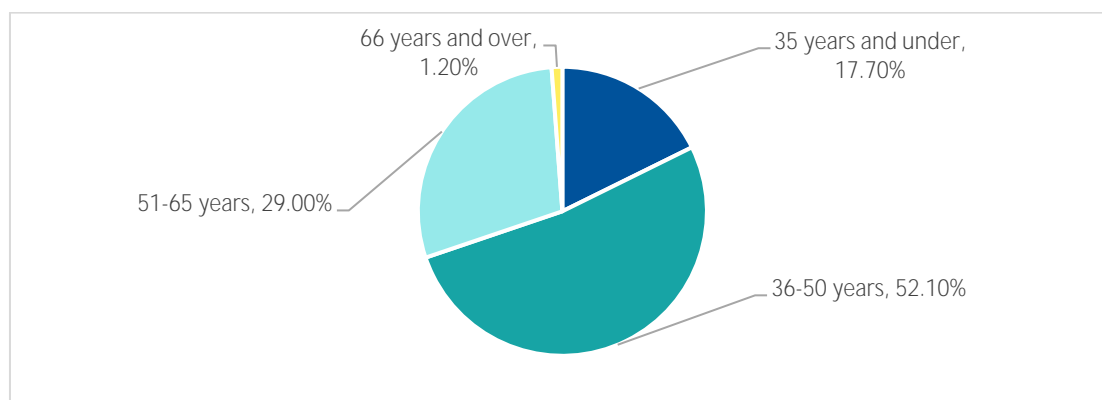
The presence of Japanese full-time students in the UK is limited, particularly when compared to student numbers from other countries. The number of Japanese full-time students enrolled on courses in the UK in 2020-21 has dropped by over a third since 2007-08 from 4,470 to 2,795.

In 2019, the UK ranked third (behind the US and Australia) among preferred international study destinations for Japanese students.⁵⁸ However, there were still only 2,684 full-time equivalent Japanese students studying in the UK,⁵⁹ compared to 14,730 students (almost six times more) enrolled on courses in the US.⁶⁰

5.3.2 Japanese staff in UK institutions

The number of Japanese academic and research staff working in UK universities has almost doubled, from 470 in 2004-05 to 770 in 2020-21, equivalent to 0.2% of all international staff. Of these staff, 29.5% carry out teaching duties only, 25.6% concentrate on research, and 28.8% combine both functions. However, the reverse is true of young academic and research staff (aged 35 or under), 56% of whom are involved in research-only activities. As shown in figure 12, in 2020-21, 52.1% of all Japanese staff in UK universities were aged 36-50; the next most populous group was individuals aged 51-65.⁶¹

Figure 12: Japanese staff in UK universities per age group 2020-21



⁵⁸ UIS.stat data, last accessed June 2022

⁵⁹ HESA Student Records, accessed June 2022

⁶⁰ UIS.stat data, last accessed June 2022

⁶¹ HESA Staff Records, accessed June 2022.

6. The future of UK-Japan collaboration

The UK and Japan already have a strong partnership in research and innovation. There
ad fieldst T/F5 12 nd J

collaboration. The COP-26 UN Climate Change Conference in November 2021⁶⁴ represented another major opportunity to foster new research collaborations focussed on addressing global challenges.

These developments highlight the opportunities to strengthen the cooperation between the UK and Japan and to encourage more, and more diverse, collaborations in R&D between the two countries.

K Sixth Science and Technology Basic Plan, which will invest JPY120 trillion public and private investment into R&D between 2021 and 2026. The plan represents further opportunities for collaboration. Among the strategic aims of the programme are building diplomatic relations with other governments and boosting joint research

combined with greater opportunities for mobility and exchange between institutions, would be welcome. Furthermore, a proactive regional diversification campaign would ensure that researchers do not end up concentrated in London institutions.

Student mobility can be a driver of future research partnerships. Existing schemes, such as the *York-Munich*⁶⁵ and *Tobitate! Study Abroad*⁶⁶ initiative, can be deployed to encourage increased student mobility in both directions.

In addition, the various research funding platforms, such as RENKEI and

7. Conclusion

The UK and Japan share long-standing traditions in international cooperation, strong leadership positions in the G7, and a deep commitment to science, technology and

8. Annexe

8.1 Case studies

8.1.1 MEXT Scholarships

MEXT Scholarships are funding opportunities for UK graduates to pursue independent research or enrol on a taught course in a Japanese higher education institution.⁶⁷ The aim is to internationalise the domestic higher education sector and provide opportunities for talented international research0 7(nn)-8(t)16(inBT1i7 Tm94()-23(c)8(our)11(s)-8(e)-5

8.2.5 Platforms for international research engagement
