

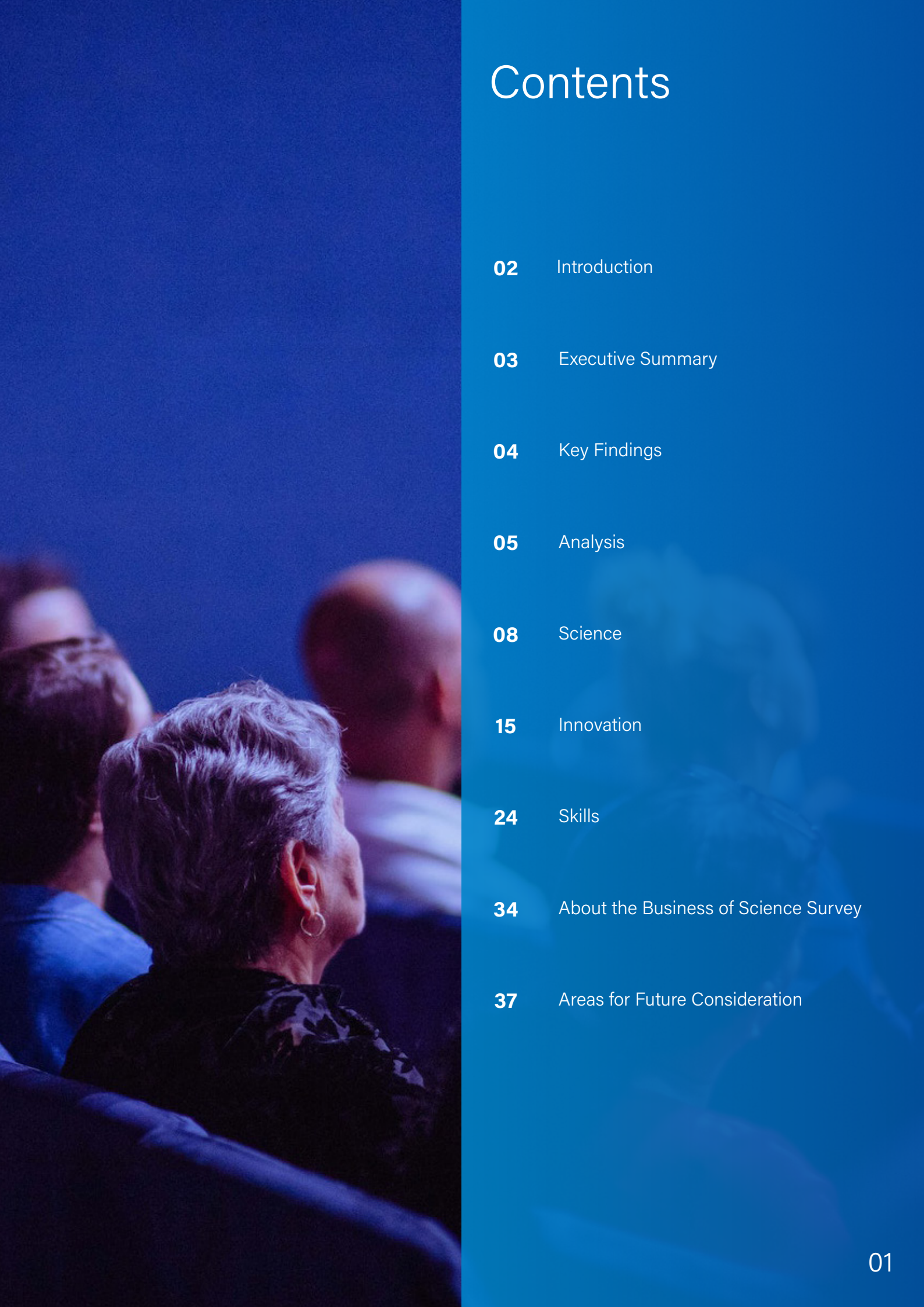
Business of Science

2022 Survey Report



Business of Science
Conference





Contents

- 02** Introduction
- 03** Executive Summary
- 04** Key Findings
- 05** Analysis
- 08** Science
- 15** Innovation
- 24** Skills
- 34** About the Business of Science Survey
- 37** Areas for Future Consideration

Introduction

Welcome to the fifth Business of Science Survey Report, developed from answers and information supplied by attendees of the Business of Science Conference, held in Edinburgh in June 2022 (BoSC22), and supplemented by further online submissions from attendees. The results, conclusions and resultant actions from those responses have prompted several discussion points and allow comparison with previous survey results.

This survey is designed to build on the growing success of previous Business of Science Conferences, first held in Manchester in 2016, and continued annually, except for 2020 due to the Covid pandemic up to 2022. BoSC23 will be in Leeds in May 2023.

As the discussion and debate around the conference key theme of “the commercialisation of science” has developed, several key questions and topics continue to emerge. This survey further explores those areas to provide informed understanding of key themes for future examination, with the questionnaire focusing on three key areas: Science, Innovation & Skills.

The key visions for Business of Science and the Conference are to:

- Explore and develop the relationship between business, science, and innovation.
- Support the commercialisation of science and innovation in its broadest sense through relevant keynotes, panel discussions and advisory sessions.
- Support and drive revenue, economic growth, and societal benefit.
- Function as an ambassador for the promotion and development of STEM (Science, Technology, Engineering and Maths) skills.
- Develop an active BoS community – a network of like-minded, but challenging individuals all engaged in Science, Innovation and Skills development.
- Provide a platform for STEM students and Future Leaders to discuss and develop their career aspirations.
- Recognise and reward Innovation and Leadership.



Much has changed again since the last BoS Survey report in 2021. Most notably, the continuation of the Covid-19 pandemic has affected everyone, and brought to the public domain, the critical value of Science, Innovation and Commercialisation. The development of Covid vaccines in 2020 meant, that at the time of writing this introduction, the UK has returned to a more open society enabling business, organisations, and people to plan future activity. At the time of BoSC22 in Edinburgh, some restrictions were still in place which affected the levels of attendance. Over recent months, the war in Ukraine, the cost of living crisis and impending UK recession have impacted organisational confidence across all sectors which is predicted to continue into 2023. Despite this, Industries, organisations, and remarkable individuals continue to work in collaboration to accelerate scientific and innovative development and increase public awareness of the value of Science and Innovation.

The UK Government long-term objectives for research and development (R&D) continue to be clear: to be a science superpower and invest in the science and research that will deliver economic growth and societal benefits across the UK for decades to come, and to build the foundations for the new industries of tomorrow. This is increasingly important to deliver long-term sustainability and to combat the increasing effects of climate change. UK Government continues to commit to investment in R&D to deliver the long-term ambition of spending 2.4% of GDP on R&D by 2027 (through both public and private investments).

I am grateful to those individuals who took time to respond, to **LOOKOUT!** for managing the process and again delivering the results.

Executive Summary

2022 marks the sixth year in which the Business of Science Conference Survey has taken place and seeks to develop an understanding of the views held by the Business of Science Conference audience in order to gain an insight into the science industry and its relation to innovation, skills, and the future of science itself. Drawing upon business, academia, research, education, and the public and third sectors, questionnaires are distributed proactively on the day of the conference, which generates the most responses, and in the two weeks following the conference, surveys are distributed via email to maximise response rates. It is important to note at this point that attendance at the 2022 conference was slightly lower compared to previous years, due to renewed concerns surrounding Covid-19 and stronger regulations in Scotland. The survey sample is also slightly smaller as a result.

Following the cancellation of the 2020 conference due to the Covid-19 pandemic, the disruption caused by lockdowns - much to the credit of the science sector - has largely dissipated over the past year and has thus enabled the resumption of the 2021 and 2022 BoSC events.

As the 'University of Salford' was the headline sponsor for this year's conference this had made an impact upon the demographics of the attendees. This year's conference attracted a higher proportion of those from academic or educational organisations at 31.5% compared to 25% in 2021. Also, for the first time at a Business of Science Conference, the leading age group was in fact those under 30 at 31%, where in previous years older age groups have dominated the survey demographics - 44% of attendees were 50+ at the 2021 conference. This has resolved a concern within previous surveys.

Questions relating to the importance of science in the future revealed that respondents believe in the impact of science on their role (91.1%) and organisation's development (92.1%) more than ever before. Results from the 2022 survey are the highest overall agreement rate in the history of the BoSC survey (2017-2022). This suggests that the importance of science in respondents' futures is becoming increasingly recognised.

Given this involvement of the science sector itself in fighting against the societal impact of the virus, there is even greater interest in the surveys following these events, to assess the impact on operations and attitudes within the science sector in the subsequent two years.

Participants were provided with a survey that matches the format of those distributed at previous conferences except for the introduction of a newer question that seeks to assess the impact of Covid-19 upon innovation within organisations operating in the science sector. As in previous years there are three principal themes:

● Science

● Innovation

● Skills

Notably, since 2021 'more coaching and mentoring' is a desired change that has taken precedence over 'improved collaboration with academia' for 2022. This is despite its declining importance since the beginning of the surveys in 2017 - decreasing from 37% in 2017 to 19% in 2021. At 24% in 2022, this may signal the need to increase coaching and mentoring again throughout organisations and may reflect the development needs of the "younger" demographic. 'Acknowledgement at Board level' remains of the same importance to respondents of the 2021 sample and continues to be the most important thing that respondents feel needs to change at 29.1%. Furthermore, 56.4% believe there has been more innovation in their organisation post-Covid-19.

Skills findings suggest marked improvement in the development of technical skills and appropriate training and knowledge requirements among both university graduates and apprentices, although apprenticeship programmes are making these improvements at a more effective and faster rate than university degree courses.

Key Findings

01

86.4% of respondents believe the science sector's contribution to the UK economy is undervalued.

02

71.4% of respondents in developing roles believe career opportunities in science are better than in other industries, compared to only 43.4% of those in commercialising roles.

03

Over 9/10 respondents believe science will have a significant impact on both their organisation's development and on their own role, within the next 3 years.

04

69% of respondents stated that innovation is encouraged and promoted at every opportunity within their organisation. This varies by 13% between the commercial and non-commercial sectors, with non-commercial reporting higher levels of innovation.

05

'Acknowledgement at board level' is still seen as the principal change needed to ensure organisational growth via innovation with 30% of respondents. Although, more coaching and mentoring is now the second most-opted for change, ahead of 'improved collaboration with academia'.

06

36.1% of respondents from non-commercial sectors believe 'improved collaboration with academia' is the most important change needed. Only 10% of those from commercial sectors believe the same.

07

The number of respondents stating there has been more innovation since the start of the pandemic has increased by 6%, from 51% to 57%.

08

58% of respondents stated they had been unable to fill vacancies that require STEM qualifications compared to only 44% in 2021, reflecting a more challenging recruitment environment.

09

Over 9/10 respondents believe both universities and apprenticeships are good ways to enable access to careers in science. This is the highest proportion in the history of the surveys.

10

75% of respondents believe apprenticeships offer the right level of technical training – an increase of 18% since 2021. 68% of respondents believe universities offer the right degree courses to suit requirements of science businesses in the future – an increase from 59% in 2021.

11

91% of respondents believe technical expertise is just as important as commercial expertise for successful leadership in a science business.

Analysis

The 2022 Sample

Who responded to the survey?

In 2022 the Business of Science Survey had (N) 89 respondents operating in a mix of sectors and backgrounds. This was evidenced by the first question, relating to the type of organisation in which the respondent worked – the question and response range is tabled below:

“Which of the following best describes the organisation you work for?”		
Response	Frequency (n)	Valid Percent (%)
Academic institution or educational organisation	28	31.5%
Company or profit-making enterprise with more than 250 employees	25	28.1%
Company or profit-making enterprise with up to 250 employees	16	18%
Public sector organisation	9	10.1%
Charity / Third Sector Organisation	1	1.1%
Other	10	11.2%
Total	89	100%

Within the 2022 survey sample, the largest category of organisation belonged to those from academic institutions or educational organisations at 31.5% (n = 28), followed by 28.1% (n = 25) from larger profit-making enterprises. This has changed since the 2021 BoSC survey where the largest response category was with those from larger profit-making enterprises (above 250 employees). This is likely a result of the change in headline sponsor (University of Salford) resulting in a higher proportion of attendees from academic or educational organisations.

Developing vs Commercialising: How does it vary by sector?

Unlike in the previous BoSC surveys, the 2022 sample shows no significant difference between the number of respondents coming from developing roles and commercialising roles, where in past surveys the number of respondents from commercialising roles has always dominated. Due to this year's higher number of respondents from academic institutions or educational organisations there was a greater split between developing roles and commercialising roles for respondents working in these areas.

Response	Valid Percent (%)	
	Developing	Commercialising
Academic institution or educational organisation	82.1%	17.9%
Company or profit-making enterprise with more than 250 employees	20%	80%
Company or profit-making enterprise with up to 250 employees	31.3%	68.7%
Public sector organisation	33.3%	66.7%
Charity / Third Sector Organisation	100%	0%
Other	50%	50%

Developing vs Commercialising: How does it vary by sector?





Within 2021, there was “a significant shift to developmental roles” when compared to the survey samples of 2019 and prior, specifically “an increase of 15% when compared to 2019 levels” (BoSC Report, 2021).

Looking at the 2022 sample, it’s clear this trend has continued with closer to equal levels of commercialising and developing roles. Again, it is important to note that this may be more representative of the increased number of attendees from academic and educational organisations than in previous years.

Overall, the split between commercialising and developing roles by sector type has largely stayed the same as the 2021 sample and therefore, represents minimal deeper lying changes within the science industry. Commercialising roles continue to dominate within companies in the profit-making category, and developing roles take precedence within the third sector or educational sectors.

Science

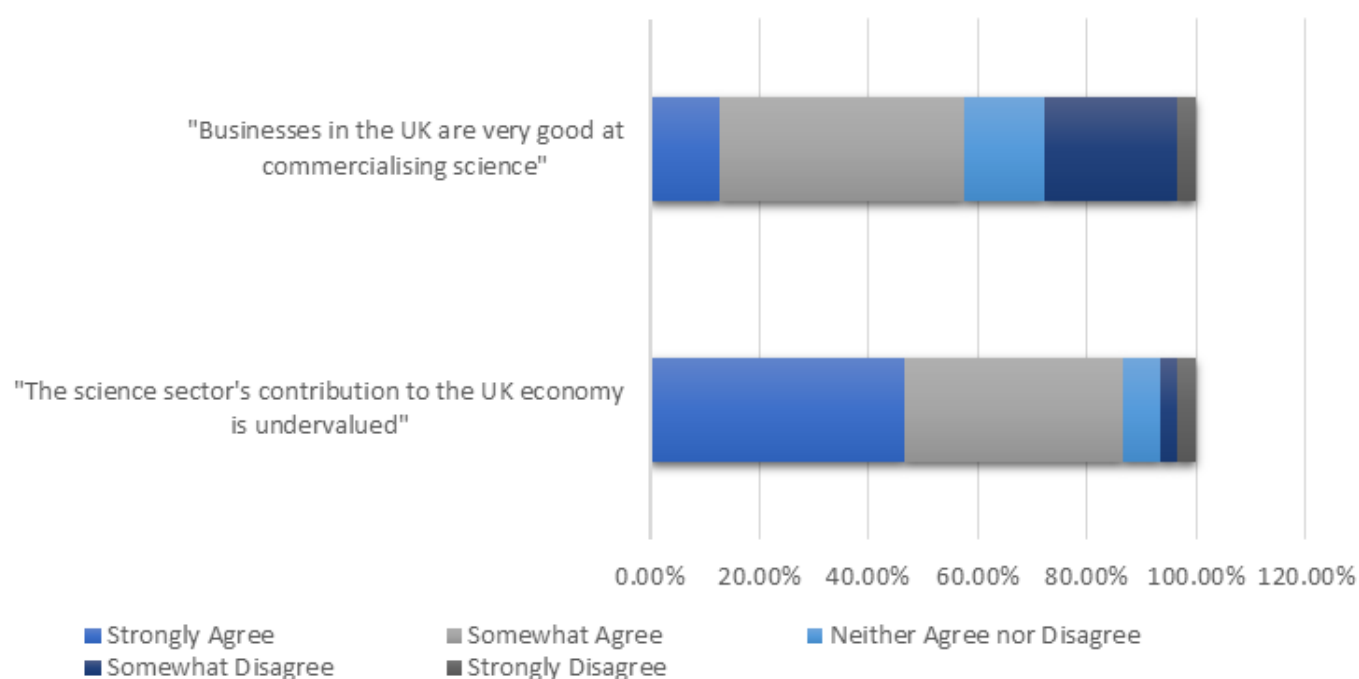
The Science Sector

Respondents were asked the extent to which they agreed with the following statements.

"The Science sector's contribution to the UK economy is undervalued"		
Response	Valid Percent (%)	Cumulative Percent (%)
Strongly Agree	46.6%	46.6%
Somewhat Agree	39.8%	86.4%
Neither Agree nor Disagree	6.8%	93.2%
Somewhat Disagree	3.4%	96.6%
Strongly Disagree	3.4%	100%
Total	100%	-

"Businesses in the UK are very good at commercialising science"		
Response	Valid Percent (%)	Cumulative Percent (%)
Strongly Agree	12.6%	12.6%
Somewhat Agree	44.8%	57.4%
Neither Agree nor Disagree	14.9%	72.3%
Somewhat Disagree	24.1%	96.4%
Strongly Disagree	3.6%	100%
Total	100%	-

Responses to Statements on the Science Sector



As seen above, 86.4% agree that the science sector's contribution to the UK economy is undervalued. Given that the same statement in the 2021 survey elicited an agreement rate of 87% it can be determined that this view has not changed among those in the scientific community. The initial rise in this high sample proportion occurred post-2019 where the agreement rate was at 78%. This suggests that recognition for the value of the science sector's economic contribution is still a pervading issue and one that has worsened since previous years.

The proportion of responses agreeing that "businesses in the UK are very good at commercialising science" was 57.5%. This prompted further analysis and breakdown.

Further analysis of...

"Businesses in the UK are very good at commercialising science"

The above statement broken down by gender, age, sector, and role (% which agree):

Overall agreement rate: **57.5%**

% Agree that "Businesses in the UK are very good at commercialising Science"			Percentage Difference
Role	Developing Role	55%	4.6%
	Commercialising Role	59.6%	
Sector	Commercial	56.1%	3.4%
	Non-commercial	52.7%	
Age	Under 40	63.9%	11.2%
	Over 40	52.7%	
Gender	Male	57.2%	3.5%
	Female	60.7%	

The most notable disparity between categories lies within age groups. 64% of those under 40 believed UK businesses to be very good at commercialising science whereas only 52.7% of those over 40 believed the same – an 11.2% difference.

This either indicates the relative inexperience of those under 40 regarding the commercialisation of science by UK businesses or represents a shift within the effectiveness of UK businesses at commercialisation within the science sector – of which, younger respondents are more aware of this change.

In relation to previous surveys, specifically 2021, only 51% of those under 40 agreed with this statement, again demonstrating a recent shift in this area.

However, the overall agreement rate between 2021 and 2022 does not show much variance.

Career Attractiveness

"To what extent do you agree with the following statements about careers in science?"

"Career opportunities in the science sector are better than in other industry sectors"		
Response	Valid Percent (%)	Cumulative Percent (%)
Strongly Agree	18.2%	18.2%
Somewhat Agree	38.6%	56.8%
Neither Agree nor Disagree	31.8%	88.6%
Somewhat Disagree	10.2%	98.8%
Strongly Disagree	1.2%	100%
Total	100%	-

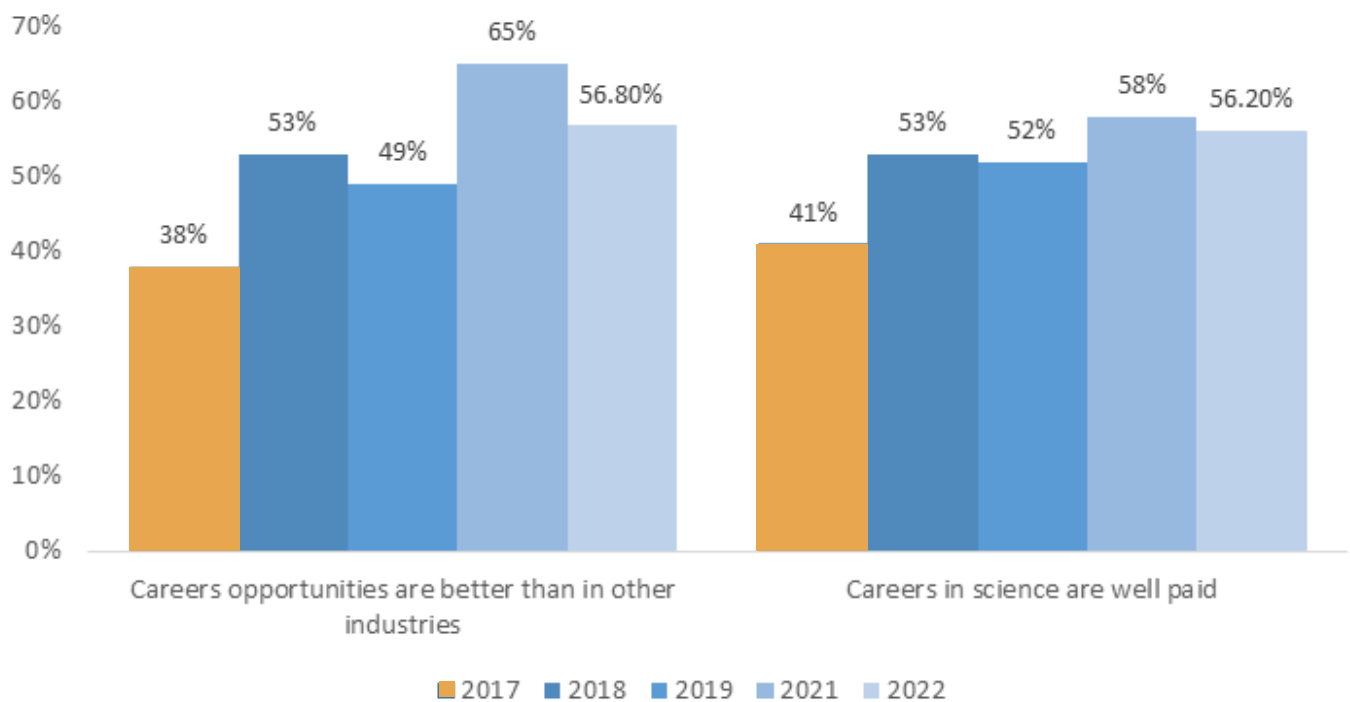
"Careers in science are well paid"		
Response	Valid Percent (%)	Cumulative Percent (%)
Strongly Agree	7.9%	17.9%
Somewhat Agree	48.3%	56.2%
Neither Agree nor Disagree	19.1%	75.3%
Somewhat Disagree	16.9%	92.2%
Strongly Disagree	7.8%	100%
Total	100%	-

Just over half of participants agreed with each statement above. With the statement regarding 'career opportunities in the science sector are better than in other industry sectors,' the agreement rate was lower this year compared to last year, at 56.8%, compared to 65% in 2021.

However, it is important to note that this is still a marked improvement from when the survey began in 2017 where around 38% of participants agreed that career opportunities in the science sector are better than in other industries.

The agreement rate for whether careers in science are well paid has predominantly remained the same but notably higher than when the surveys began at 56.2% in 2022 compared to 41% in 2017.

Proportion of Agreement to Statements about Careers in Science



Further analysis of...

"Career opportunities in the Science sector are better than in other industry sectors"

Overall agreement rate: 56.8%

% Agree that career opportunities in science are better than other industries			Percentage Difference
Role	Developing Role	71.4%	28%
	Commercialising Role	43.4%	
Sector	Commercial	47.5%	18.3%
	Non-commercial	65.8%	
Age	Under 40	64.6%	14.6%
	Over 40	50%	
Gender	Male	60%	3.3%
	Female	56.7%	

Further analysis of the statement above revealed some large disparities within the different categories of respondents. For instance, while 71.4% of those in developing roles agreed that the science sector had better career opportunities than other sectors, only 43.4% of those within commercialising roles agreed the same – a significant difference of 28%.

It can be concluded that, based on this sample at least, career opportunities in the science sector for those pursuing developing roles are markedly better than those pursuing commercialising roles. This disparity did not exist within the 2021 survey where agreement rates between developing and commercialising roles were almost indistinguishable (65% vs 67%), possibly suggesting career opportunities within the commercialising science sector have dwindled in the past year, perhaps a feature of the current state of the UK economy.

Those under 40 agreed at a higher rate than those over 40 (64.6% vs 50% respectively) which may suggest that while career opportunities are better in the science industry for younger workers, these opportunities do not extend to those over 40 – a finding that is not particularly surprising as organisations aim to recruit younger workers. Interestingly, those within the commercial sector have a lower rate of agreement than those in the non-commercial sector, although again perhaps not so surprising due to the competitiveness of profit-making enterprises.

Importance of Science in the Future

“To what extent do you agree with the following statements about the role of science in your organisation / role?”

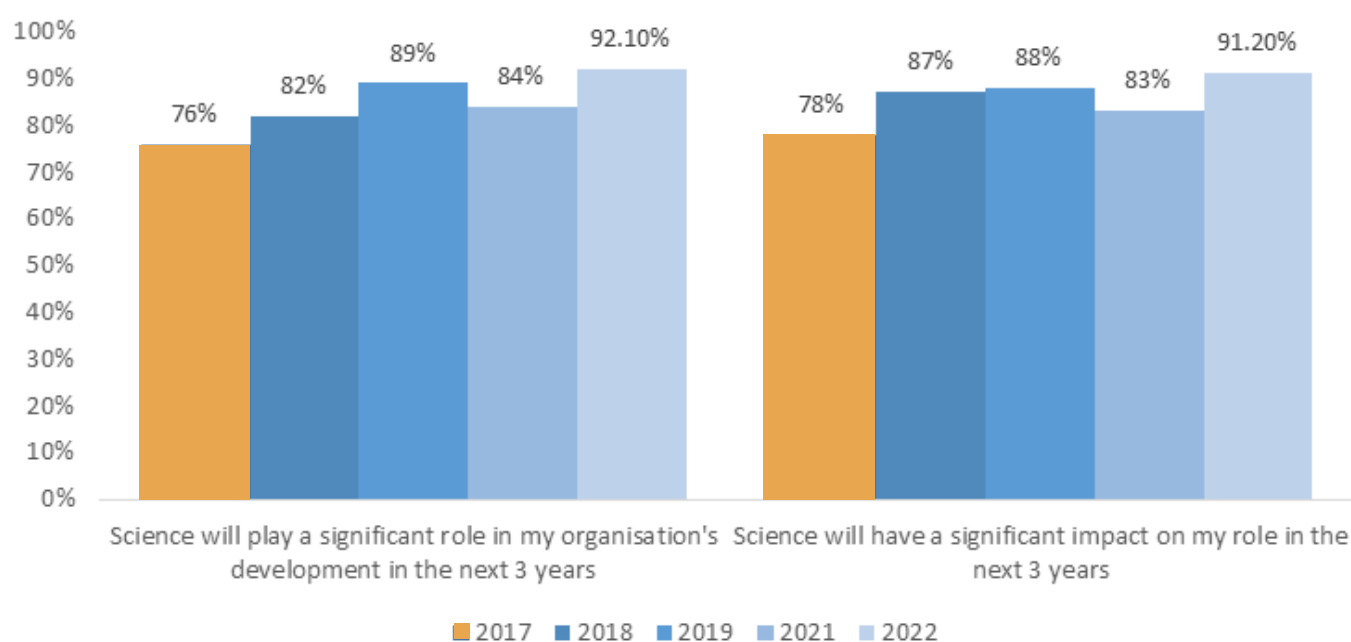
“Science will play a significant role in my organisation’s development in the next 3 years”		
Response	Valid Percent (%)	Cumulative Percent (%)
Strongly Agree	77.5%	77.5%
Somewhat Agree	14.6%	92.1%
Neither Agree nor Disagree	7.9%	100%
Somewhat Disagree	-	-
Strongly Disagree	-	-
Total	100%	-

"Science will have a significant impact on my role in the next 3 years"

Response	Valid Percent (%)	Cumulative Percent (%)
Strongly Agree	69%	69%
Somewhat Agree	22.2%	91.2%
Neither Agree nor Disagree	4.4%	95.6%
Somewhat Disagree	4.4%	100%
Strongly Disagree	-	-
Total	100%	-

Results from the 2022 survey for the above statements are the highest overall agreement rate in the history of the BoSC survey (2017-2022). After a drop in the agreement rate post-Covid, it has now increased to its highest point yet. Respondents believe in the impact of science on their role (91.2%) and organisation's development (92.1%) more than ever before. This suggests more people are recognising the importance of science in their futures.

Proportion of Agreement to Statements about the Importance of Science in the Future



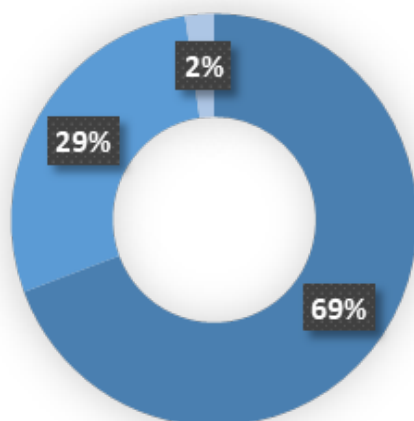
Innovation

The section on innovation within the BoSC survey directed respondents to focus upon: the way in which innovation is approached by their organisation and how much it features in discussion; the respondent's personal views on innovation when considered as an important feature of organisational growth; the extent to which their organisation has acted upon the ideas and embedded culture of innovation (words vs action); and finally new to last year's survey, the extent to which Covid-19 impacted upon organisational innovation.

"Which of the following most accurately describes your organisation's approach to innovation?"

Response	Frequency (n)	Valid Percent (%)
Innovation is encouraged and promoted at every opportunity	61	69.3%
Innovation is something that's talked about a lot, but doesn't really happen	25	28.4%
Innovation is rarely discussed, and is not encouraged or valued	2	2.3%
Total	88	100%

Which of the following most accurately describes your organisation's approach to innovation?



- Innovation is encouraged and promoted at every opportunity
- Innovation is something that's talked about a lot, but doesn't really happen
- Innovation is rarely discussed, and is not encouraged or valued

The 2022 survey revealed that 69% of survey participants stated that their organisation's approach was to encourage and promote innovation at every opportunity and 29% stated that while innovation is spoken of a lot, it doesn't really materialise. In relation to previous years, the 2021 survey revealed that 76% responded in the above manner and in 2019, this figure was 72%. Therefore, this is the lowest rate of agreement since the surveys began in 2017 (previous lowest was 70% in 2017). To better understand why this is the case, the agreeing respondents were broken down via category.

Further analysis of...

"Innovation is promoted and encouraged at every opportunity"

Overall agreement rate (that innovation is actively encouraged and promoted): 69.3%

% Agree that within their organisation "Innovation is promoted and encouraged at every opportunity"			Percentage Difference
Role	Developing Role	73.8%	8.6%
	Commercialising Role	65.2%	
Sector	Commercial	62.5%	13.8%
	Non-commercial	76.3%	
Age	Under 40	73.5%	7.7%
	Over 40	65.8%	
Gender	Male	75%	11.7%
	Female	63.3%	

As seen from the data above, the findings tell us that the likely 'profile' of a respondent who stated that 'innovation is encouraged and promoted at every opportunity' within their organisation is that of a male, under 40, in a developing role and working within the non-commercial sector.

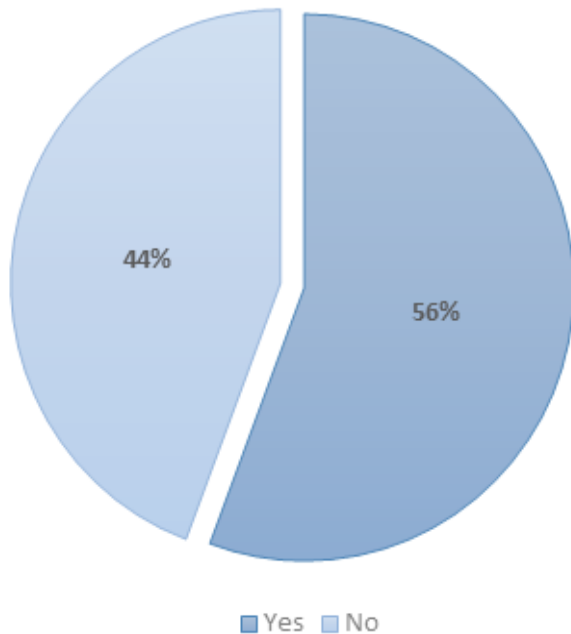
survey suggest that over the past year, innovation may have taken a backseat within commercial organisations, specifically for those over 40 working in commercialising roles. This may also be a result of the increased number of 2022 survey respondents from the non-commercial sector.

In 2021, the profile for this same question was a male, over 40, in a commercialising role and working within the commercial sector. Findings from this

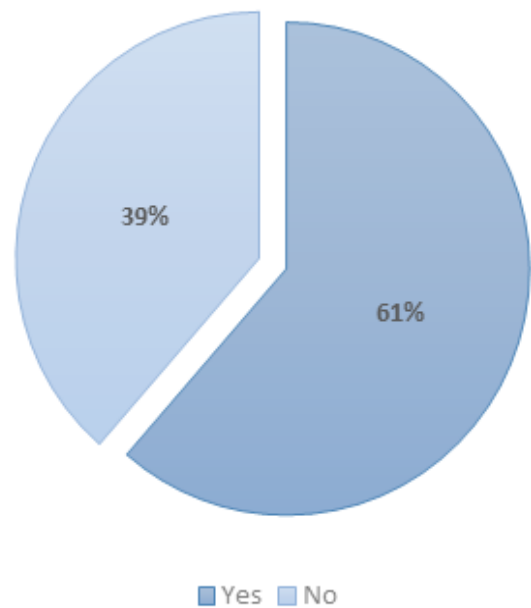
Launching New Products & Services

"In the last 2 years, my organisation has..."

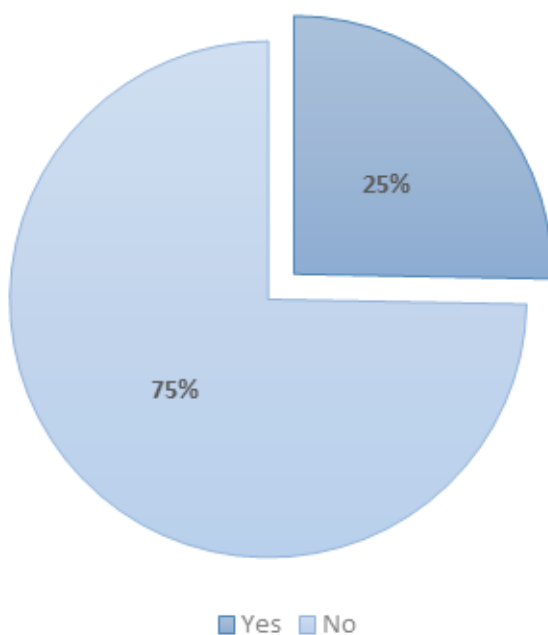
Launched a new product that is new to our organisation



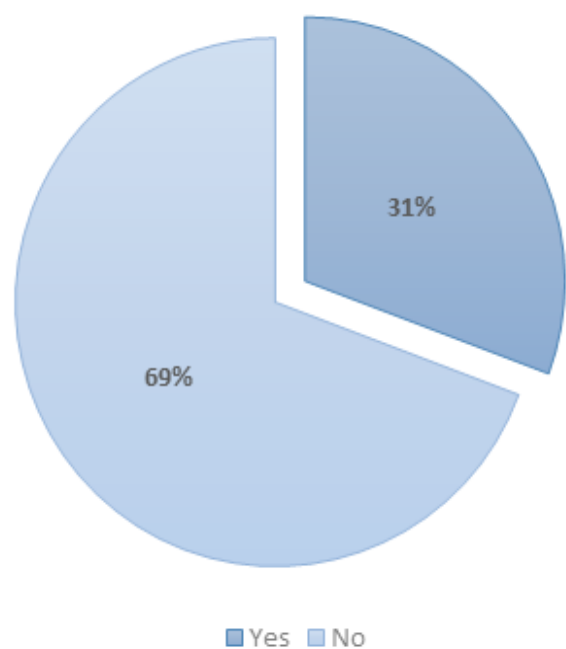
Launched a new service that is new to our organisation



Launched a new product that is new to our industry sector

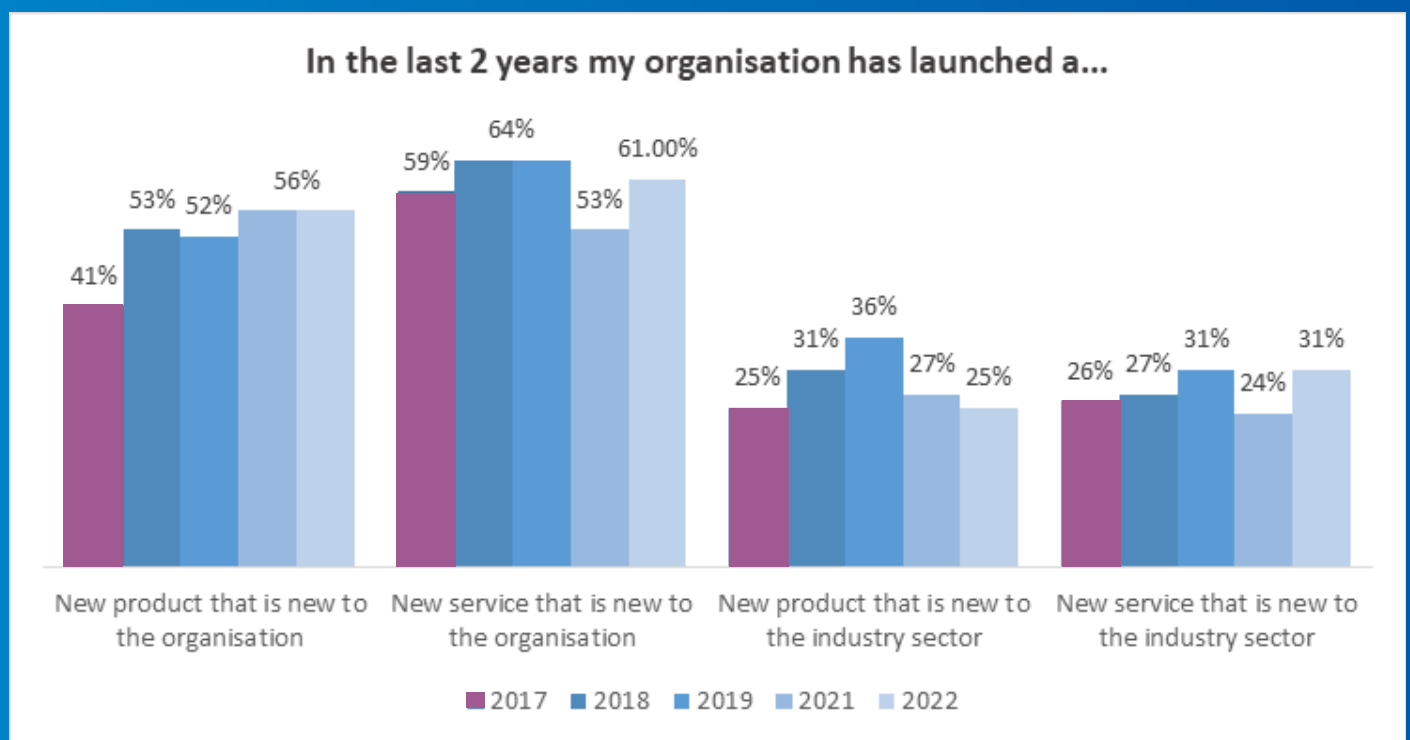


Launched a new service that is new to our industry sector



In line with all past surveys, most new products and services are launched within the organisation compared to within the industry sector and again, it is new services that are new to the organisation that are launched at a higher rate than new products. Also, as in previous years, new products and services are introduced at double the rate within organisations than they are within industry sectors.

Below we will compare figures from previous years to assess any significant changes.



As the graph shows, the only significant changes from 2021 are within new services introduced to the organisation and new services introduced to the industry sector. Within the former, there has been an 8% rise in the extent to which new services are introduced to their respective organisations, perhaps because of the rebound from Covid-19.

Corroborating this finding is the 7% increase with the extent to which new services are introduced to their respective industry sectors. Minimal changes are seen in relation to the introduction of new products either within the organisation or to their industry sector suggesting there has been a larger focus on creating new services than creating new products within the past year.

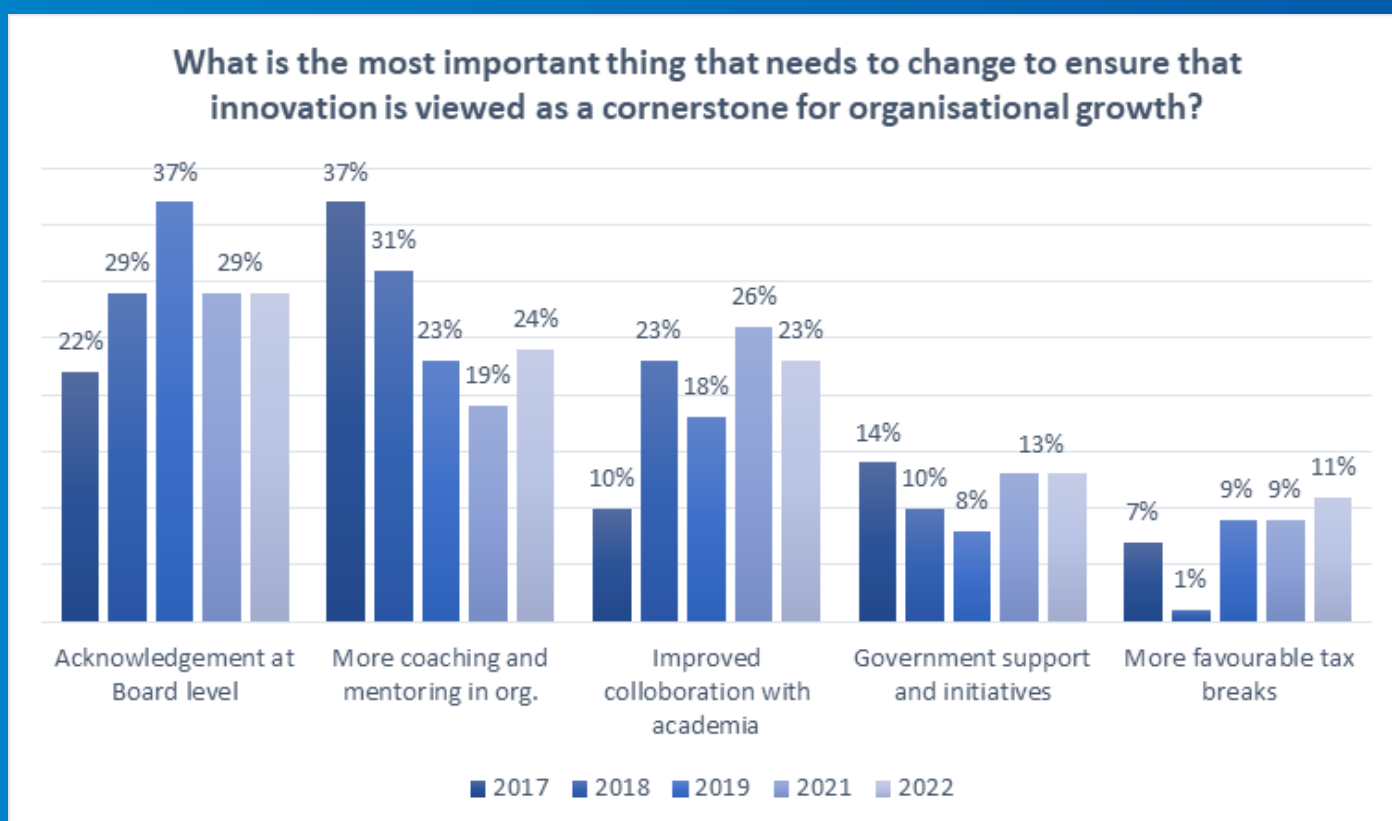
It is also important to note that except for introducing new products to their own organisation (which saw its high in 2021), all other product and service launch figures are below pre-Covid levels (2019).

Organisational Approach

"What is the most important thing that needs to change to ensure that innovation is viewed as a cornerstone for organisational growth?"

Response	Frequency (n)	Valid Percent (%)
Acknowledgement at Board level that Innovation is a necessary driver for growth	25	29.1%
More coaching and mentoring throughout the organisation to build an Innovation culture	21	24.4%
Improved collaboration with Academia	20	23.3%
Government support and initiatives, other than financial	11	12.8%
More favourable tax breaks to encourage innovation	9	12.8%
Total	86	100%

Acknowledgement at board level is still seen as the strongest factor that should change to ensure innovation is the cornerstone of growth, with 29.1% of respondents. This was followed by 24.4% responding that more coaching and mentoring is required to build an innovation culture and 23.3% suggesting a requirement for improved collaboration with academia.



Notably, since 2021 'more coaching and mentoring' is a desired change that has taken precedence over 'improved collaboration with academia' for 2022, whereas in 2021 this was seen as the third most important thing (now the second most important) that needs to change to ensure innovation is viewed as a cornerstone for organisational growth.

This is despite its declining importance since the beginning of the surveys in 2017 – decreasing from 37% in 2017 to 19% in 2021. At 24% in 2022, this may signal the need for raised efforts to increase the amount of coaching and mentoring again throughout organisations. 'Acknowledgement at Board level' remains of the same importance to respondents of the 2021 sample and continues to be the most important thing that respondents feel needs to change.

Innovation for Growth

Due to the nature of this report, it was deemed appropriate to assess further attitudes relating to 'improved collaboration with academia' as a change that is needed to ensure innovation is viewed as a cornerstone for growth. Below are the outputs:

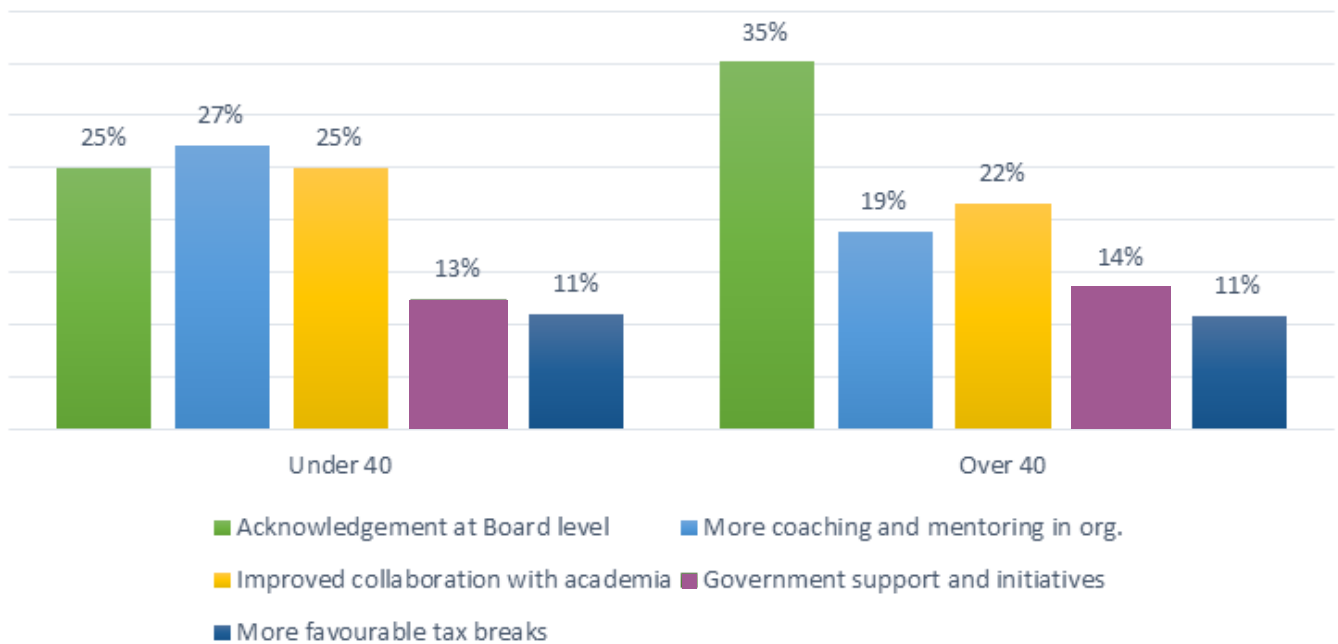
% Agree that "improved collaboration with academia" is the most important change needed to ensure innovation as the cornerstone of growth			Percentage Difference
Role	Developing Role	31.7%	16.1%
	Commercialising Role	15.6%	
Sector	Commercial	10%	26.1%
	Non-commercial	36.1%	
Age	Under 40	25%	3.4%
	Over 40	21.6%	
Gender	Male	20%	11%
	Female	31%	

Findings suggest that a significantly higher proportion of those working in non-commercial sectors believe that the one thing that needs to change in relation to innovation and growth is 'improved collaboration with academia.'

In fact, 36.1% of respondents from the non-commercial sector responded with this, compared to only 10% of those from the commercial sector – a 26.1% difference. Those in developing roles also saw this being significantly more important than those in commercialising roles, suggesting those in commercialising roles place less importance upon collaborating with academia – 31.7% (developing) vs 15.6% (commercialising). Also, unlike within the previous 2021 survey, no significant disparity was seen for these findings between those under 40 and those over 40.

Driver for Growth by Age

What is the most important thing that needs to change to ensure that innovation is viewed as a cornerstone for organisational growth?



Further analysis of the drivers of growth by age reveals great variance between the opinions of those under 40 versus over 40. The most important change to ensure growth via innovation according to those under 40 is the increased 'implementation of coaching and mentoring throughout their organisation', perhaps not particularly surprising as those younger in an organisation are likely to be lower in the hierarchy and in need of greater guidance.

Conversely, only 19% of those over 40 believed this to be most important. Of most importance to those over 40 was 'acknowledgement at board level', compared to only 25% of those under 40 believing the same.

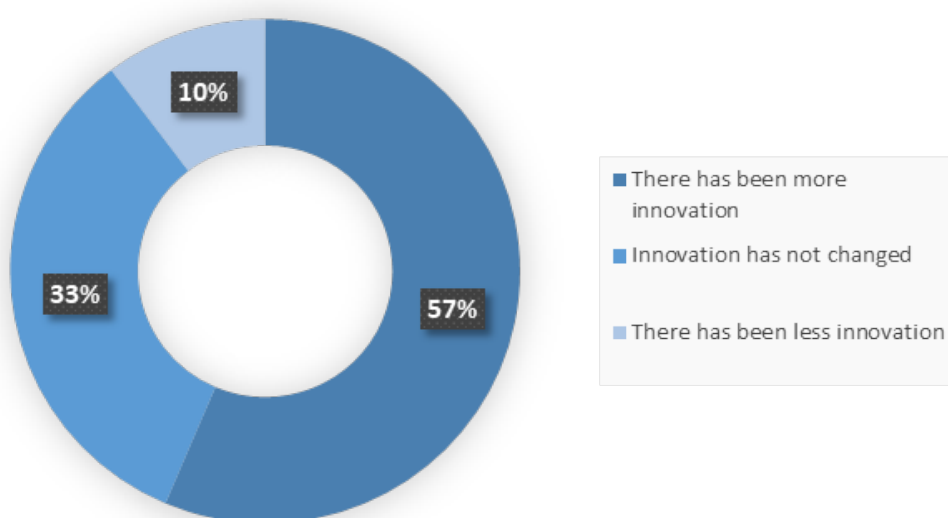
The proportion of those under 40 and over 40 voting the most important thing to be 'government support and initiatives' or 'more favourable tax breaks' was equal. There was also only a 3% difference in proportion for the 'improved collaboration with academia'. Therefore, the only areas of significant differentiation between ages were with 'more coaching and mentoring' and 'acknowledgement at board level'.

Innovation and COVID

"To what extent has your organisation's approach to innovation changed since the start of the coronavirus (Covid-19) pandemic?"

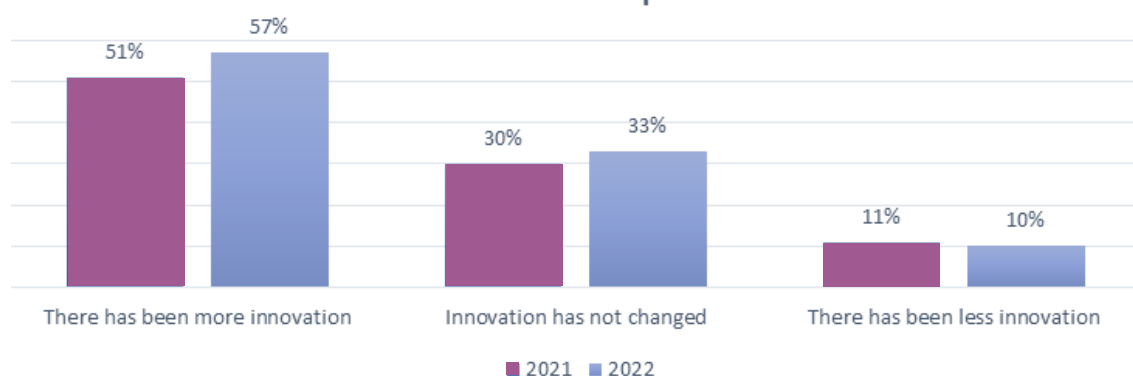
Response	Frequency (n)	Valid Percent (%)
There has been more innovation	44	56.4%
Innovation has not changed	26	33.3%
There has been less innovation	8	10.3%
Total	78	100%

To what extent has your organisation's approach to innovation changed since the start of the pandemic?



Results for this question are almost identical to that of last year's findings. Again, more than half (57%) believe 'there has been more innovation' since the start of the pandemic. 33% believe 'innovation has not changed' and 10% believe that there has been less innovation.

To what extent has your organisation's approach to innovation changed since the start of the pandemic?



Qualifications and Career Access

"To what extent do you agree with the following statements about qualifications / accessing careers in science?"

"We have been unable to fill vacancies that require STEM qualifications"		
Response	Valid Percent (%)	Cumulative Percent (%)
Strongly Agree	26%	26%
Somewhat Agree	31.5%	57.5%
Neither Agree nor Disagree	20.5%	78%
Somewhat Disagree	11%	89%
Strongly Disagree	11%	100%
Total	100%	-

"School leavers come to us with a suitable level of knowledge and skills in STEM subjects"		
Response	Valid Percent (%)	Cumulative Percent (%)
Strongly Agree	7%	7%
Somewhat Agree	36.7%	43.7%
Neither Agree nor Disagree	33.8%	77.5%
Somewhat Disagree	16.9%	94.4%
Strongly Disagree	5.6%	100%
Total	100%	-

Findings show that 57.5% of respondents agree that 'they have been unable to fill vacancies that require STEM qualifications,' an increase since the 2021 survey, where only 44% said they have been unable to fill vacancies that require STEM qualifications. 44% of respondents agree that 'school leavers come to them with a suitable level of knowledge and skills in STEM subjects,' with 16.9% disagreeing with this statement, whereas in 2021 only 30% agreed with this statement and 25% disagreed. However, it is also important to note that these questions are still eliciting a high proportion of 'neutral' responses.

The next section will analyse the variance in agreement (if any) in the extent to which apprenticeships and universities are good ways of enabling access to careers in science.

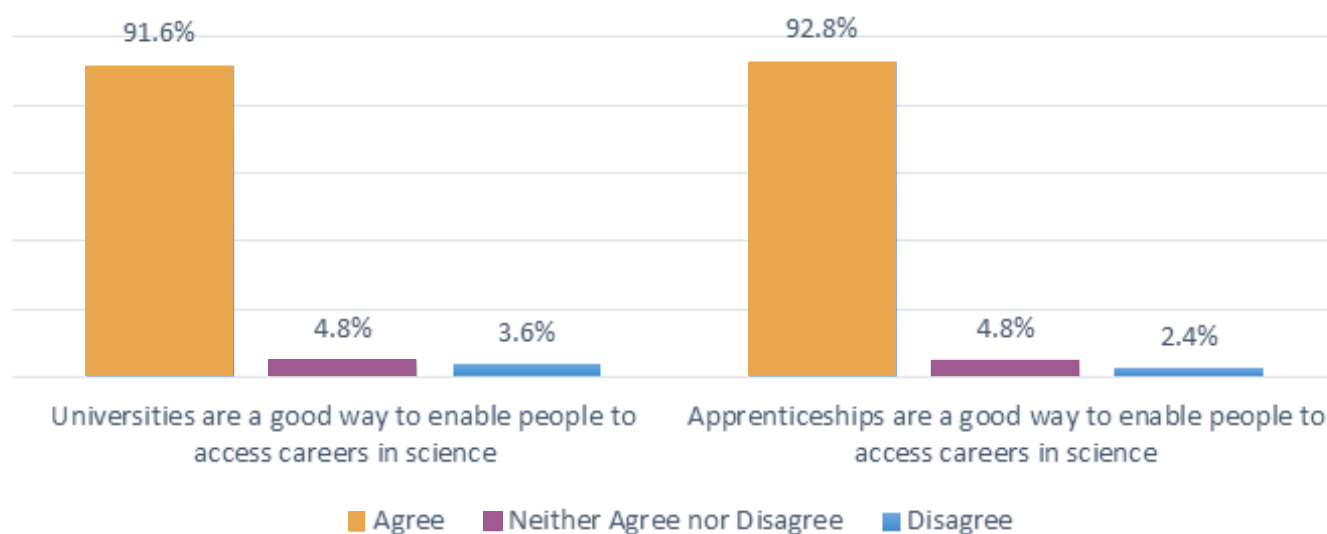
"Universities are a good way to enable people to access careers in science"

Response	Valid Percent (%)	Cumulative Percent (%)
Strongly Agree	54.8%	54.8%
Somewhat Agree	36.8%	91.6%
Neither Agree nor Disagree	4.8%	96.4%
Somewhat Disagree	3.6%	100%
Strongly Disagree	-	-
Total	100%	-

"Apprenticeships are a good way to enable people to access careers in science"

Response	Valid Percent (%)	Cumulative Percent (%)
Strongly Agree	54.8%	54.8%
Somewhat Agree	38%	92.8%
Neither Agree nor Disagree	4.8%	97.6%
Somewhat Disagree	2.4%	100%
Strongly Disagree	-	-
Total	100%	-

To what extent do you agree with the following statements about qualifications / accessing careers in science?

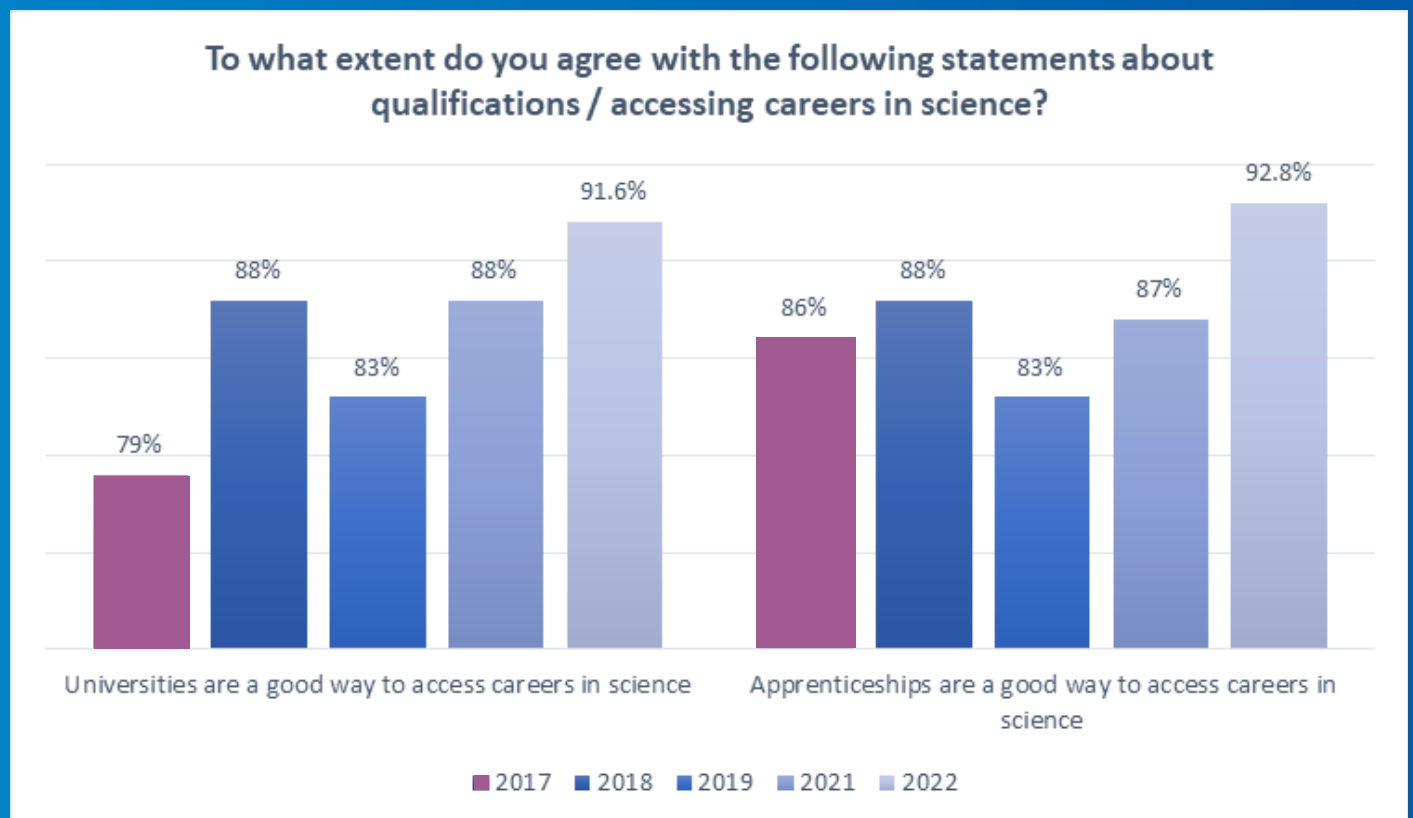


It is clear from the findings above that apprenticeships and universities are consistently viewed as a good way to access careers in science. Over 9/10 respondents believed both universities and apprenticeships to be good ways to access careers in science. Only 3.6% and 2.4% disagreed respectively.

Throughout all previous surveys findings have been very similar and respondents have repeatedly maintained that accessing careers in science is heavily supported and enabled by attending university and taking an apprenticeship.

When surveys first began in 2017, 79% of respondents saw universities as offering good access to careers in science, a figure which has now reached its highest point at 91.6%, suggesting in the past 5 years people are increasingly regarding universities as a good way to accessing careers in science. In addition, while apprenticeships have always maintained agreement scores of between 80-90%, the agreement rate for this question in 2022 is also at its highest point at 92.8%. Therefore, it is appropriate to conclude that STEM apprenticeships and university courses are heading in the right direction if their aim is to increase students' access to careers in science.

The graph below represents how agreement with these statements has changed over the course of the 5 years of BoSC surveys.



Qualifications and Career Access

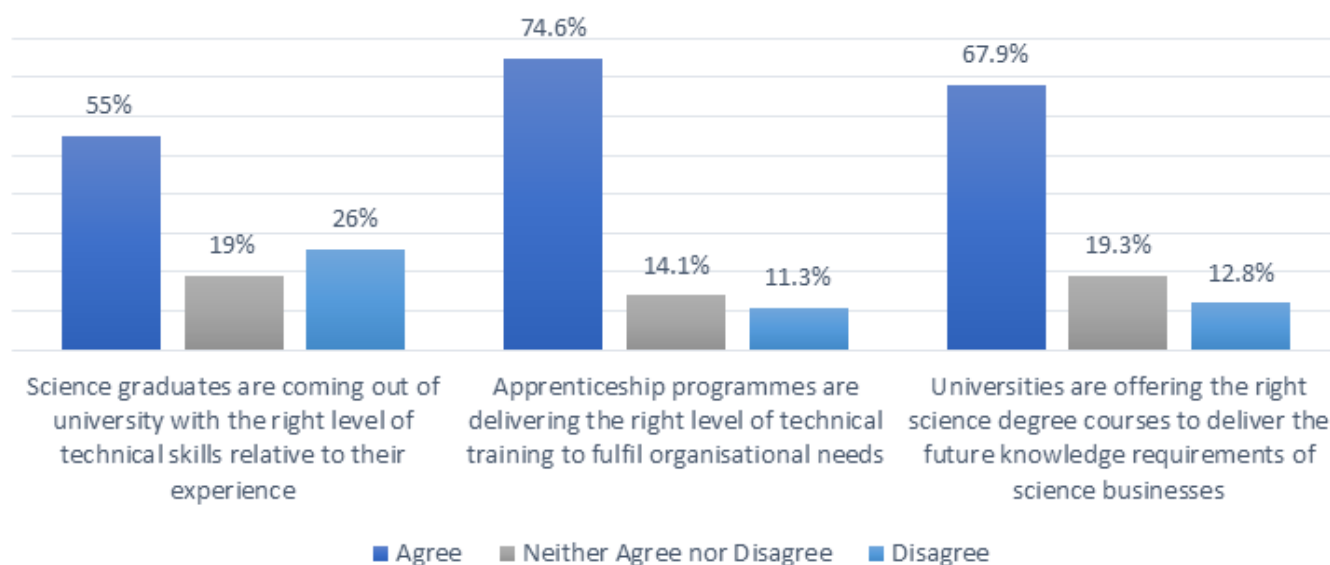
"To what extent do you agree with the following statements about technical skills provided by apprenticeship / graduate schemes?"

"Science graduates are coming out of university with the right level of technical skills relative to their experience"		
Response	Valid Percent (%)	Cumulative Percent (%)
Strongly Agree	15%	15%
Somewhat Agree	40%	55%
Neither Agree nor Disagree	18.8%	73.8%
Somewhat Disagree	26.2%	100%
Strongly Disagree	-	-
Total	100%	-

"Apprenticeship programmes are delivering the right level of technical training to fulfil organisational needs"		
Response	Valid Percent (%)	Cumulative Percent (%)
Strongly Agree	28.2%	28.2%
Somewhat Agree	46.4%	74.6%
Neither Agree nor Disagree	14.1%	88.7%
Somewhat Disagree	9.9%	98.6%
Strongly Disagree	1.4%	98.6%
Total	100%	-

"Universities are offering the right science degree courses to deliver the future knowledge requirements of science businesses"		
Response	Valid Percent (%)	Cumulative Percent (%)
Strongly Agree	11.5%	11.5%
Somewhat Agree	56.4%	67.9%
Neither Agree nor Disagree	19.3%	87.2%
Somewhat Disagree	11.5%	98.7%
Strongly Disagree	1.3%	100%
Total	100%	-

To what extent do you agree with the following statements about qualifications / accessing careers in science?

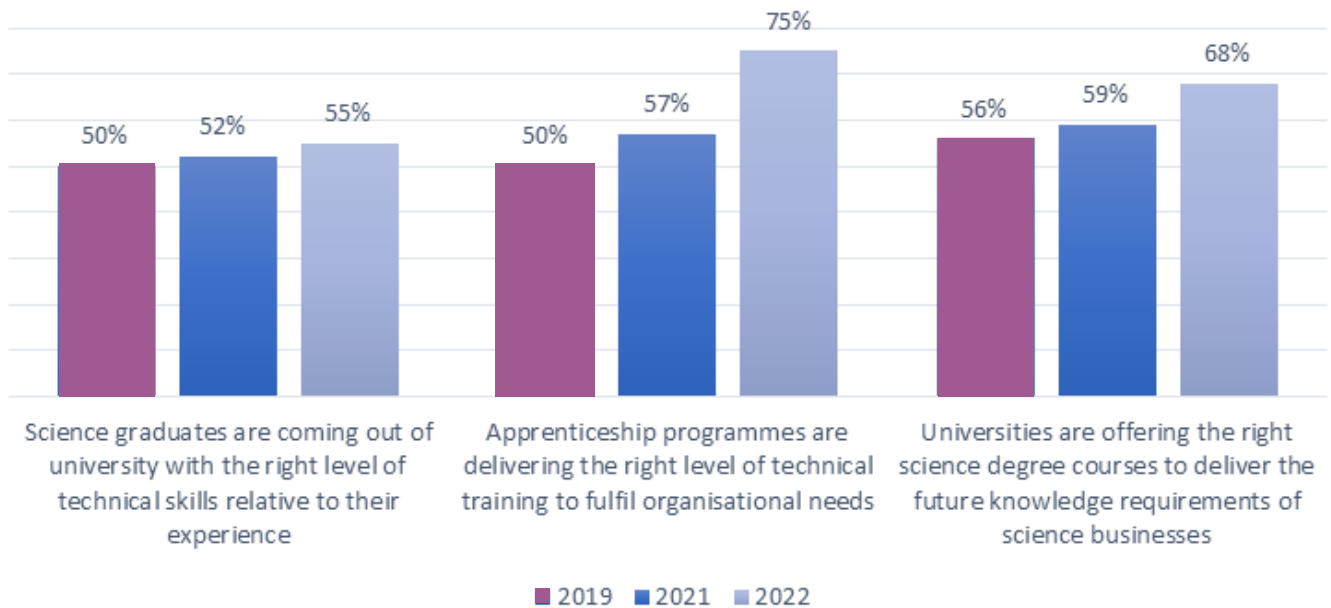


In line with the previous survey at 52% for 2021, over half the participants (55%) believe that science graduates are coming out of university with the right level of technical skills relative to their experience. Interestingly, 75% believe that apprenticeship programmes are delivering the right level of technical training to fulfil organisational needs, suggesting that apprenticeship programmes are better when it comes to delivering technical training and ensuring the development of technical skills. Furthermore, this view has increased by 18% since 2021 when only 57% agreed with the above regarding apprenticeship programmes. Whereas the proportion of those agreeing with the former relating to science graduates and technical skills has only increased by 3%.

However, there has been a marked improvement in the proportion of respondents who believe that universities are offering the right science degree courses to deliver the future knowledge requirements of science businesses – an increase from 59% to 68%.

These findings suggest improvement in the development of technical skills and appropriate training and knowledge requirements among both university graduates and apprentices, although apprenticeship programmes are making these improvements at a more effective and faster rate than university degree courses.

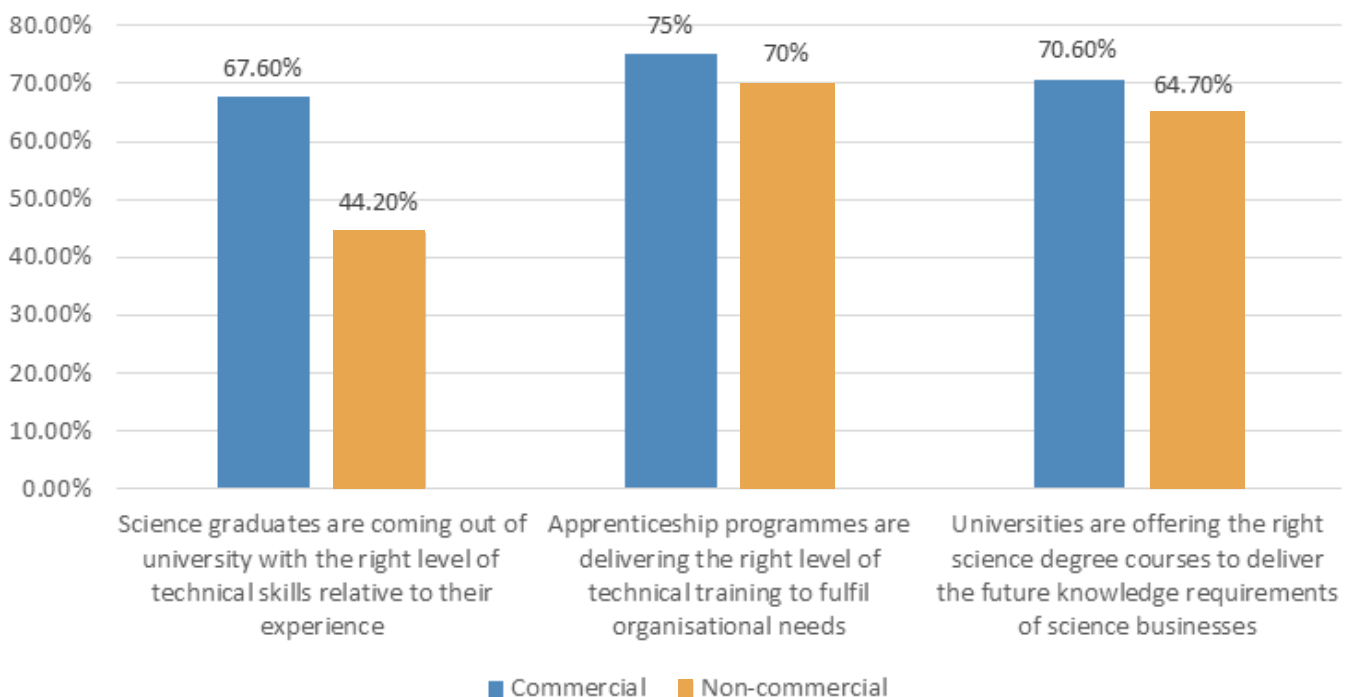
**To what extent do you agree with the following statements about technical skills provided by apprenticeship / graduate schemes?
(% which agreed)**



Over the past 3 years there has been an increased percentage of respondents indicating satisfaction with the positive impact provided by both universities and apprenticeship programmes.

The chart below will show the comparison with participants from commercial and non-commercial sectors.

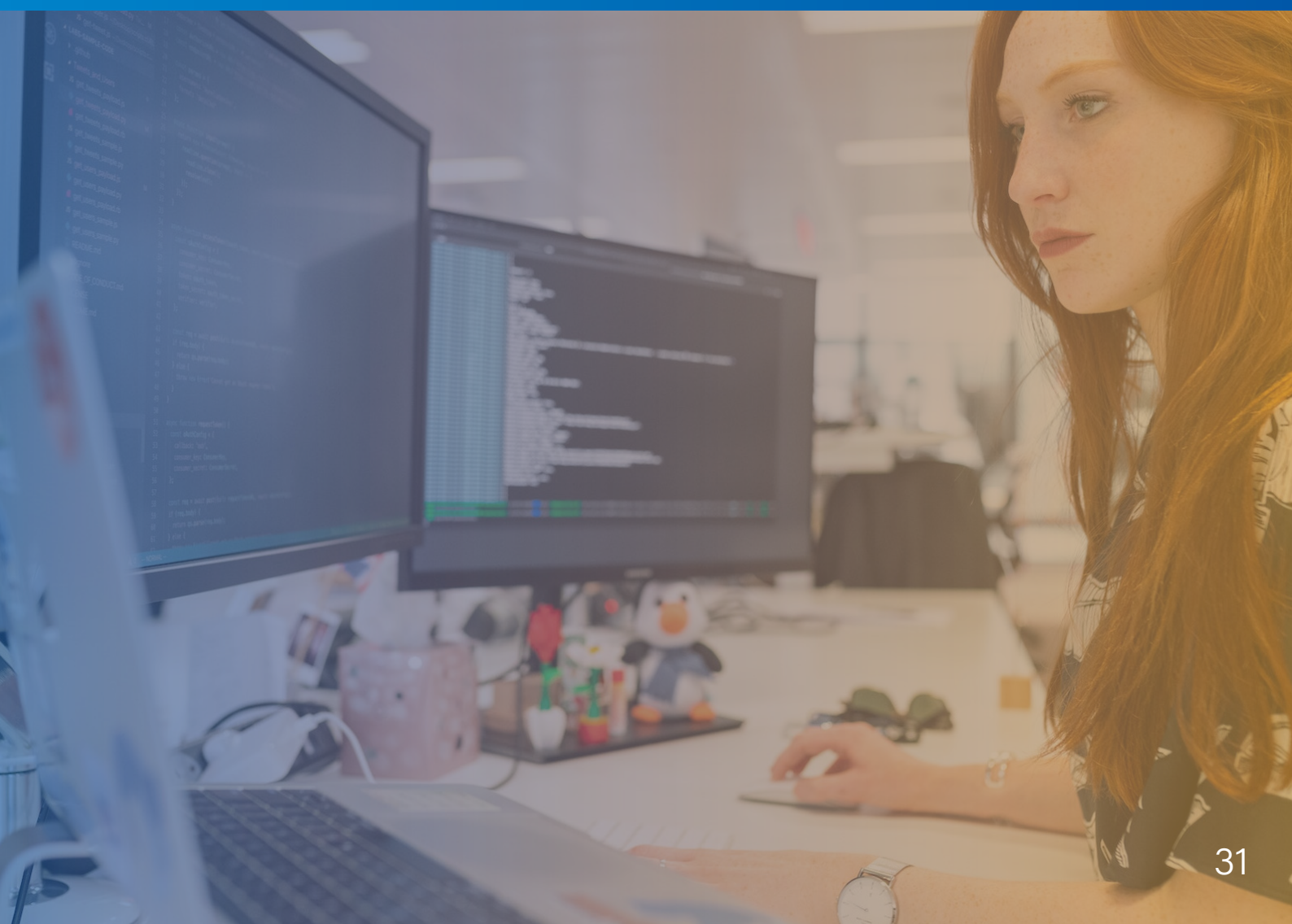
Technical Skills: Commercial vs Non-commercial (% which agree)



67.6% of participants from the commercial sector believe that graduates are leaving university with the right level of technical skills. Only 44.2% from the non-commercial sector hold this same view. However, it is important to note that both proportions have increased since the 2021 survey and have significantly improved when compared to the 2019 survey where the rate of agreement for this statement was found to be 31% for commercial and 19% for non-commercial. This may indicate that within the past 3 years, improvements have been made to the degree courses of science students to equip them with the appropriate technical skills.

There has also been significant improvement in the rate at which those from the commercial and non-commercial sector believe apprenticeship programmes deliver the right level of technical training. 75% of those from the commercial sector believe this to be the case, compared to 64% of respondents in 2021. 70% of those from the non-commercial sector also believe this to be the case, compared to only 48% in 2021.

These findings have now become more aligned with the number of participants that agree apprenticeships are a good way for people to access science careers (93%) by reducing the disparity between those from commercial and non-commercial sectors and responding to the concern raised within the 2021 survey.

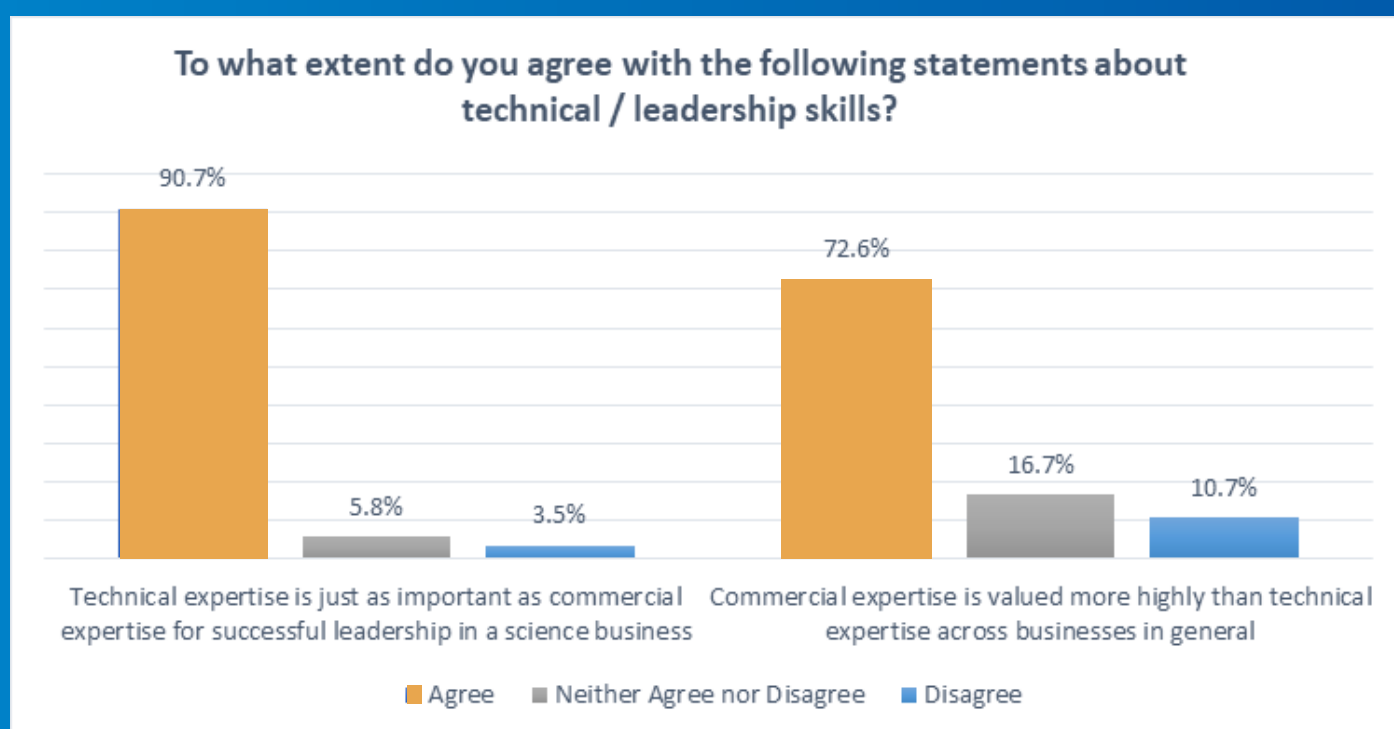


Technical vs Commercial Expertise

"To what extent do you agree with the following statements about technical / leadership skills?"

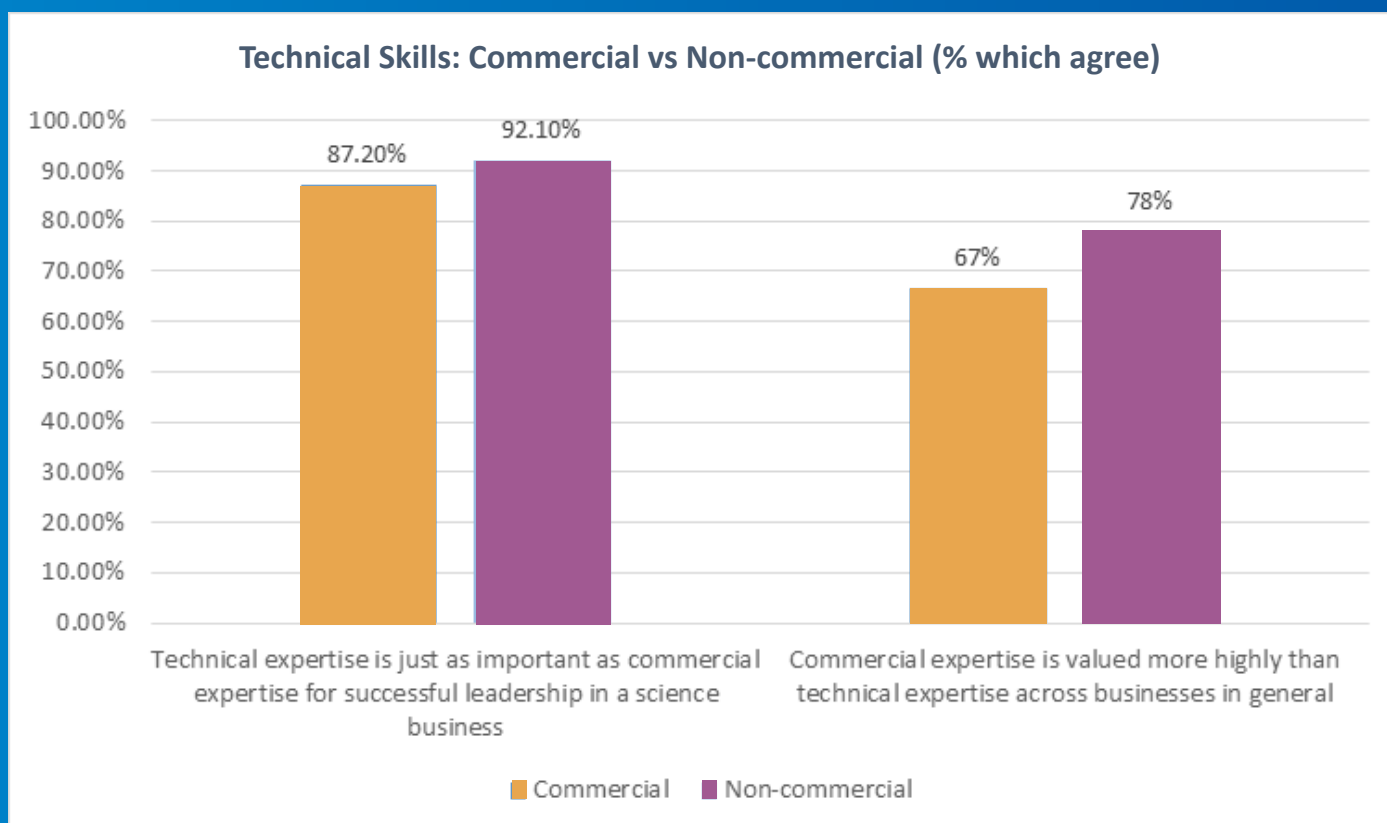
"Technical expertise is just as important as commercial expertise for successful leadership in a science business"		
Response	Valid Percent (%)	Cumulative Percent (%)
Strongly Agree	51.2%	51.2%
Somewhat Agree	39.5%	90.7%
Neither Agree nor Disagree	5.8%	96.5%
Somewhat Disagree	3.5%	100%
Strongly Disagree	-	-
Total	100%	-

"Commercial expertise is valued more highly than technical expertise across businesses in general"		
Response	Valid Percent (%)	Cumulative Percent (%)
Strongly Agree	31%	31%
Somewhat Agree	41.6%	72.6%
Neither Agree nor Disagree	16.7%	89.3%
Somewhat Disagree	8.3%	97.6%
Strongly Disagree	2.4%	100%
Total	100%	-



Since the 2021 survey, an increased proportion of people believe 'technical expertise is just as important as commercial expertise for successful leadership in a science business', whereas in 2021 85% agreed and in 2022, 90.7% agreed. Interestingly, the proportion of respondents believing that 'commercial expertise is valued more highly than technical expertise across businesses in general' has also increased from 67% in 2021 to 72.6% in 2022.

Therefore, 9/10 respondents believe technical skills are an integral part of successful leadership within the science sector, whereas in other industries generally, commercial expertise is valued more highly; hence, highlighting the importance of teaching the right technical skills when it comes to STEM degrees and apprenticeships.



The findings above show the proportion of those from commercial and non-commercial sectors who agreed with the statements listed. 5% more respondents from non-commercial sectors agreed that technical expertise is just as important as commercial expertise for successful leadership in a science business – 92.1% (non-commercial) vs 87.2% (commercial). This is a notable increase of around 8% from the 2021 survey for those respondents from the non-commercial sector (2021 figure for non-commercial – 84%).

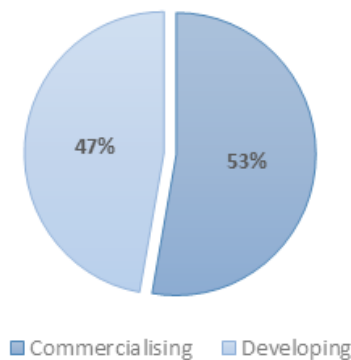
Furthermore, respondents from commercial sectors in 2021 believed that commercial expertise is valued more highly than technical expertise across businesses generally when compared to those from non-commercial sectors – 71% (commercial) vs 61% (non-commercial). It would appear this has now changed for the 2022 survey. More respondents from non-commercial sectors now view the same at 78% – an increase of 17%. Non-commercial respondents also believe this at a higher rate than commercial respondents suggesting this relationship has now reversed – in 2022, 67% (commercial) vs 78% (non-commercial).

About the Business of Science Survey

The Data

From a market research perspective, readers' attention is drawn to the fact that the sample, whilst specific to the Business of Science Conference audience, is relatively small. Therefore, an element of caution should be exercised when drawing conclusions from this research.

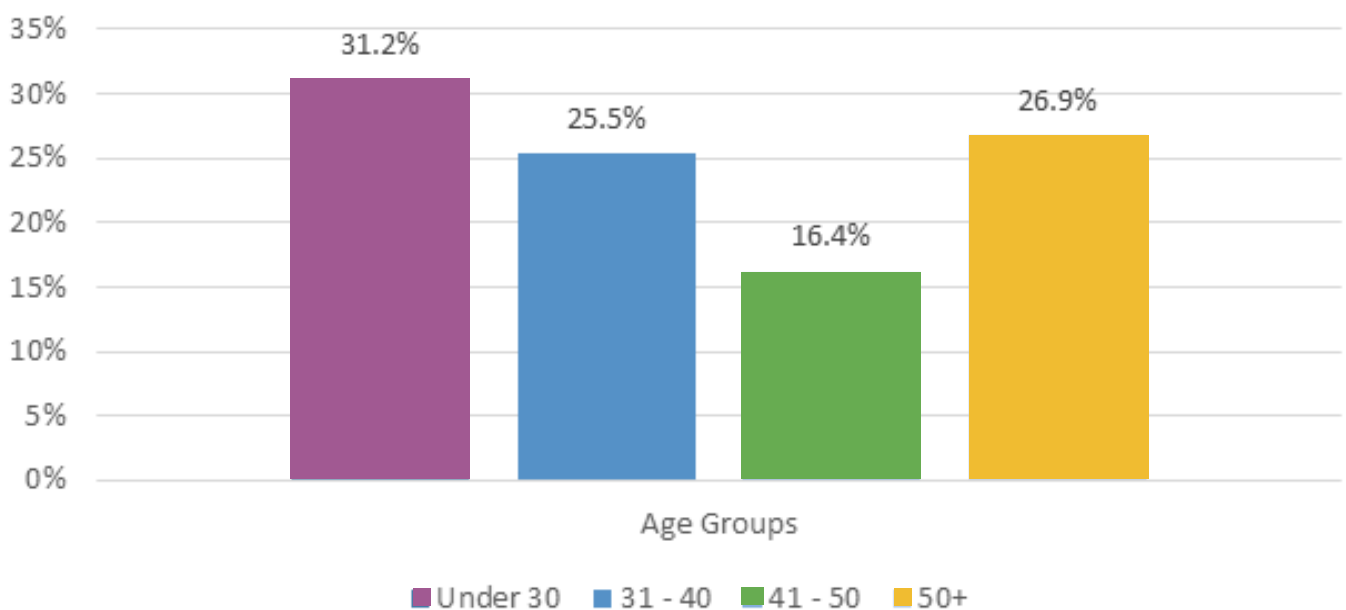
2022 Sample - Role: Commercialising vs Developing



Role: Commercialising vs Developing

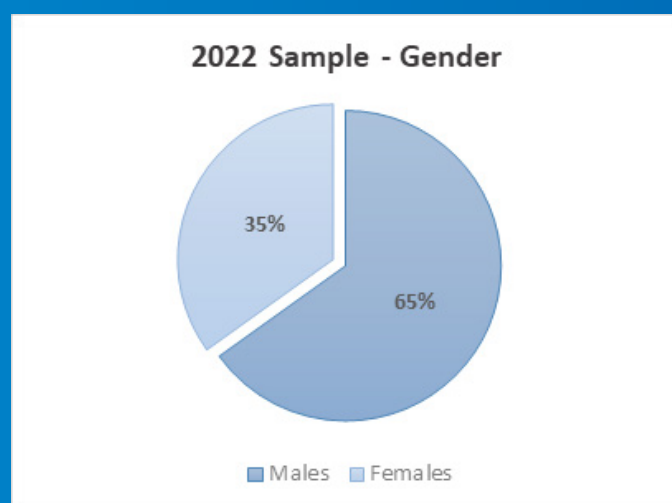
The 2022 sample, when compared to the sample of 2021, had a more even split between those working in commercialising roles and developing roles (53% Commercialising and 47% Developing), compared to the 2021 sample (56% and 44% respectively).

2022 Sample - Age Groups



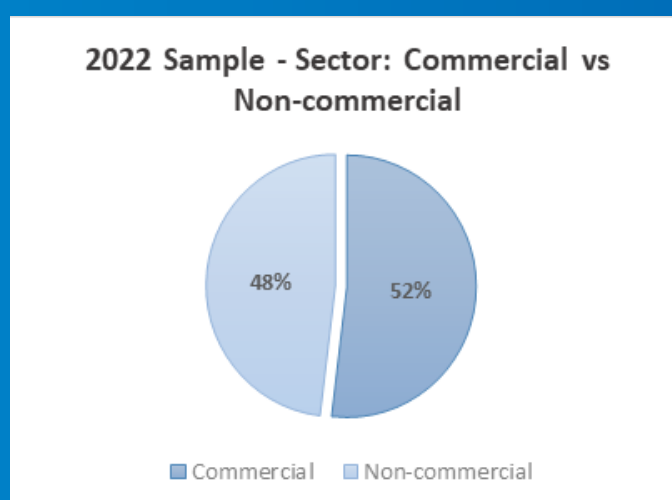
The largest age group within the 2022 sample were those under 30-years-old at 31.2%. 26.9% were aged 50+ and 25.5% were aged 31 – 40-years-old. Therefore, the smallest age group were those aged between 41-50. Interestingly, this has changed since the 2021 sample where the largest group was by far those aged 50+ at 44% of respondents for that year. More than double any other age group. This may be due to the change in headline sponsor for this survey year (University of Salford) where it is likely a higher proportion of young people attended as a result.

Gender



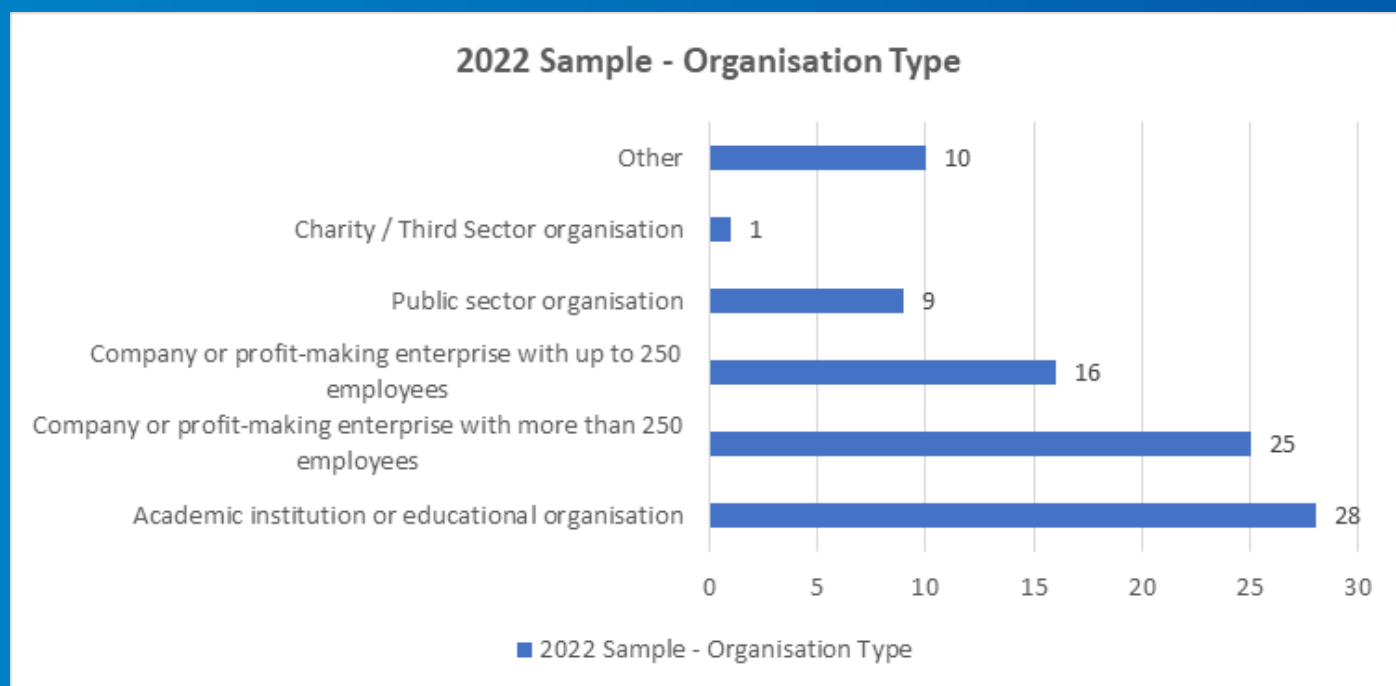
Within the 2022 sample, 65% of respondents were male and 35% female. This suggests there is still a greater proportion of males attending and / or being interested in science events than females or represents a pre-existing barrier to entry to the science industry when it comes to gender. Despite the younger demographic of respondents in 2022 vs 2021, there was only a small increase in female respondents in this year's sample.

Sector



The 2022 sample also had an almost even split between those respondents who worked in commercial and non-commercial sectors. 52% of respondents were from commercial organisations and 48% from non-commercial.

Organisation Type



Areas for Further Consideration

01

Consistent with the 2021 survey, 87% of 2022 respondents agreed that the science sector's contribution to the UK economy is undervalued with this figure rising from 78% pre-Covid. As this is clearly still a pervading issue, what can be done to encourage people to recognise the value that the science sector brings to the UK economy?

02

It can be concluded that based on this sample, career opportunities in the science sector for those pursuing developing roles are markedly better than those pursuing commercialising roles. Why is there such a difference between developing and commercialising roles in relation to career opportunities? And what can be done to rectify this disparity?

03

Innovation is encouraged and promoted more within organisations operating within the non-commercial sector. Why is the importance of innovation less widely recognised and supported within organisations operating in commercial sectors?

04

Despite its relative decline over the past 5 years, the past year has led to a rise in the importance placed upon more coaching and mentoring as the number one change needed to ensure innovation underpins organisational growth. What is driving this increased need for more coaching and mentoring?

05

The most important change needed for innovation to be seen as the cornerstone of organisational growth varies heavily between the commercial and non-commercial sector. In relation to 'improved collaboration with academia', 26.1% more respondents from the non-commercial sector responded with this. How can this reluctance to collaborate with academia be explained for those organisations operating within the commercial sector?

06

According to survey findings, the extent to which universities and apprenticeships are considered good ways to access careers in science is at its highest ever point. Why, therefore, are 58% of respondents also answering that they have been unable to fill vacancies that require STEM qualifications. Does this indicate a declining number of STEM graduates who go on to work within the science sector post-university? And if so, what can be done to attract STEM graduates back towards the science sector?