



Institute for Apprenticeships  
& Technical Education

## Future-facing innovation strategy



## Contents

|  |    |
|--|----|
| Foreword .....   | 3  |
| Executive summary .....  | 5  |
| Our vision for a future-facing skills system.....  | 7  |
| IfATE’s vision for a model which contains a range of responses to an emerging skill need ..... | 8  |
| Our three future-facing principles .....   | 9  |
| Section 1: What are innovation skills and emerging skills?.....                                | 12 |
| Section 2: The importance of innovation skills and emerging skills .....                       | 14 |
| Section 3: Our commitments.....  | 15 |
| Technical qualifications and apprenticeships .....   | 15 |
| Partnerships .....   | 16 |
| Our organisation .....   | 17 |
| Acknowledgements .....   | 19 |
| References.....  | 20 |





## Foreword

Innovation is at the heart of the government's agenda.<sup>1</sup> Innovation is key to meeting the challenge of climate change, to driving productivity and economic growth, and to creating high-paid jobs that benefit everyone in society.<sup>2</sup>

We are witnessing technological and global change at an unparalleled pace.<sup>3</sup> Automation, artificial intelligence and digitalisation, and the green transition<sup>4</sup> demand a transformation.<sup>5</sup> By 2030, nine in ten employees will need to acquire new skills.<sup>6</sup> All parts of the economy, labour market, and skills system need to be agile and flexible to capitalise on innovation and stay ahead of need.<sup>7</sup>

### The voice of employers

As the voice of employers, IfATE has a critical role to play in supporting an agile economy. We will deliver a future workforce for employers by harnessing the expertise of employers and professionals from across the technical education landscape to create high-quality, future proofed technical qualifications and apprenticeships that foster innovation and enable skills development, meet the rapid pace of change in the labour market, and support a growing economy.

Our employers are uniquely placed to work with stakeholders, innovators, technologists and researchers to look ahead and identify where skills needs are emerging. And more than that, they have the insight and expertise to translate technological and environmental change and the country's innovation and growth strategy into the knowledge, skills and behaviour that the workforce needs<sup>8</sup>. They know best what training is needed to fill skills gaps, keep pace with technological advances, push forward the green agenda, and support innovation and economic growth. But the scale of the challenge is significant. There is more for us to do.

The motivation behind our strategy is simple: rapid technological, global and climate change is transforming our world, skills, and jobs. And the ambition behind our strategy is clear: proactively work with employers, innovators, technologists and researchers to identify emerging skills and through testing and validation embed them in our technical qualifications and apprenticeships at the optimal time.<sup>9</sup>

Skills are central to productivity, innovation and economic development.<sup>10</sup> By providing job-specific training alongside underpinning knowledge, skills, and behaviours, technical education prepares apprentices and learners for their careers now and in the future. Delivering a technical education system that anticipates and supplies the skills required of the future workforce creates routes to sustainable, skilled employment, improving productivity and providing a ladder of opportunity.

Our strategy will enable IfATE's occupational standards, apprenticeships and IfATE-approved qualifications to anticipate and meet employers' skills need in a timely way with reduced skills gaps and increased productivity. As a result, the economy, innovation, and employers will be supported by a globally competitive, skilled workforce fit for the future.



## **Dame Fiona Kendrick**

Deputy Chair of the Institute for Apprenticeships and Technical Education (IfATE) Board



## Executive summary

Whether to deliver the transformation required by climate change, to prepare for changing workforce demographics, to harness the opportunities of digital technology, or to drive the innovation and growth vital to global competition, employers need a skilled workforce, fit for the future.

The Institute for Apprenticeships and Technical Education (IfATE) works with thousands of employers to ensure that the skills system meets their needs and supports apprentices, learners and people in work.

This strategy sets out IfATE's vision to ensure a future-facing, dynamic technical education system which supports employers to meet their future skills needs, reducing the risk of skills gaps and shortages, while maintaining stability. It makes specific commitments including the use of a range of responses to employers' emerging skills need such as issuing guidance to support responsive skills provision through short courses and Skills Bootcamps, an evidence-led approach to decision making, working in partnership with technologists, innovators, researchers, educators and employers to gain the best possible picture of what's ahead, and working with regions to identify current and future labour market requirements to ensure technical qualifications and apprenticeships respond.

At the heart of the strategy is a principle to act in partnership with stakeholders as part of a wider skills system. The task, to identify and anticipate emerging skills across the labour market, is by its nature a challenging one. Changes driven by emerging technology and skills do not impact all employers or all sectors at the same point in time, or at the same pace. The speed and type of preparation required across parts of the skills system is similarly varied. There isn't a perfect method for predicting and articulating emerging skills needs and there isn't a one-size-fits-all response that will meet the needs of all employers. Our approach acknowledges this challenge and sets out a requirement to draw on a broad range of sources of insight and intelligence, both qualitative and quantitative, along with an agile, flexible range of responses that can test and validate insight and demand for emerging skills, to accommodate the varied pace of change across sectors and employers.

Critically, the commitments we set out can only be delivered through collaboration with employers, providers, awarding bodies, innovators, technologists and researchers. Each part of the system has access to insight, expertise and knowledge about new technology, national and regional labour market demand, industry and sector change, and emerging skill needs that together sketch out the shape of the future workforce. Through convening, listening, and collaborating, we can build a future facing technical education system responsive to the needs of all stakeholders.

In this strategy we set out a model for our approach to meet emerging skills need, where a range of available responses work together, achieving a balance between dynamism and stability. More rapid provision, including Skills Bootcamps, offers a quick response to emerging skills need, growing the number of people with an emerging skill set, and at the same time preparing the way for longer term updates to occupational standards, apprenticeships, and technical qualifications.

At IfATE we believe we are well placed to work together with employers, innovators, researchers, providers, awarding bodies, and wider stakeholders to understand the shape of the future workforce and identify where new skills needs are emerging. Through testing and validation, we will embed emerging skills in our technical qualifications and apprenticeships at the optimal time and by doing so, maximise the role that apprenticeships and technical education have to play in driving innovation and growth, ensuring we deliver for employers, learners, and the economy.

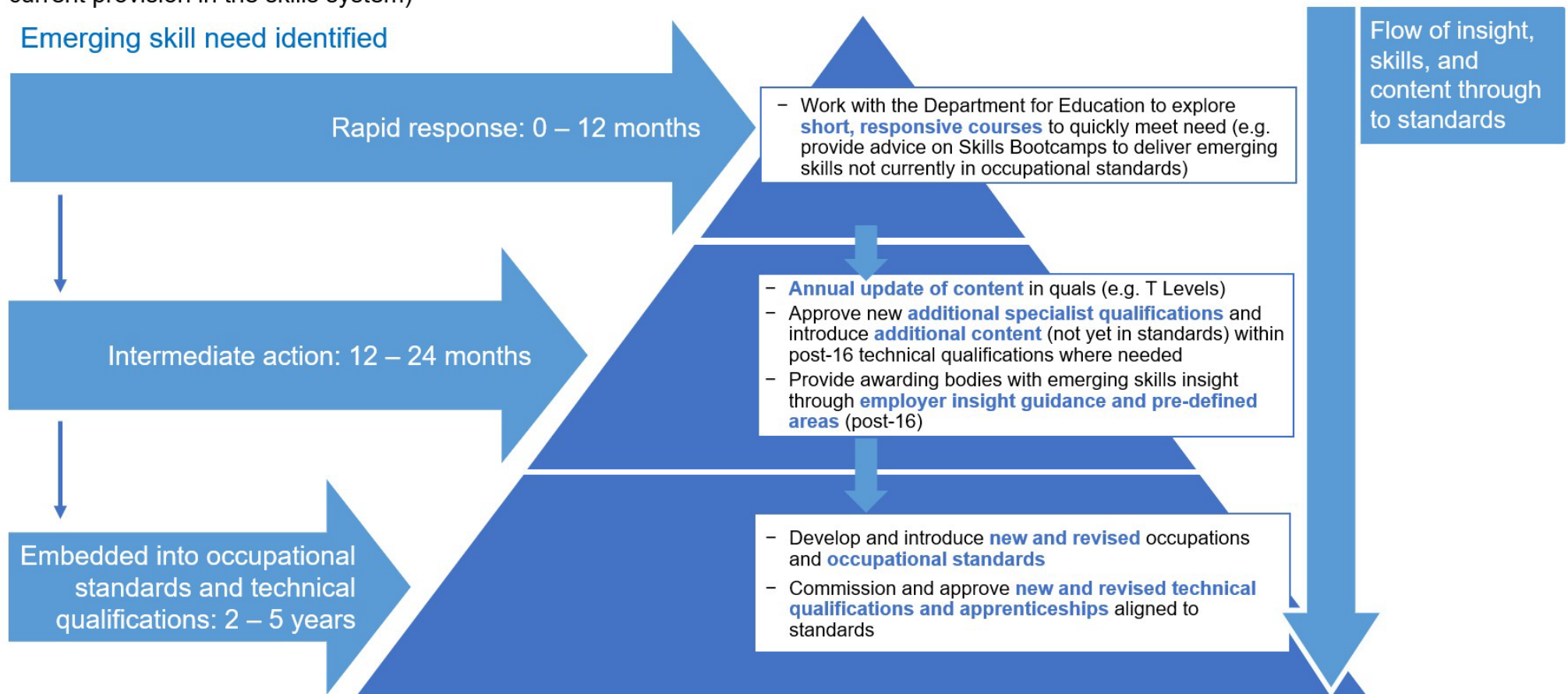


# Our vision for a future-facing skills system

Figure1: IfATE's vision for a model which contains a range of responses to an emerging skill need

## Responding to employer need: a vision for meeting emerging skills need through IfATE's technical qualifications, apprenticeships and occupational standards

IfATE's vision for a model which contains a range of responses to employer need for new training content (emerging skill need not met by current provision in the skills system)



## IfATE's vision for a model which contains a range of responses to an emerging skill need

Our vision for a future-facing skills system sees a balance between dynamism and stability, recognising the importance of both the need for responsiveness to emerging skills, and the need for a stable set of occupational standards that serve a wide range of employers.

In this strategy, we set out a model for our approach to meet emerging skills need, where a range of available responses work together. More rapid provision, including Skills Bootcamps and the inclusion of additional content in technical qualifications, offers a quick response to emerging skills need, growing the number of people with that emerging skill set, and at the same time preparing the way for longer term updates to occupational standards, apprenticeships, and technical qualifications.

Rightly, IfATE's occupational standards (employer-led standards that define the content of technical courses, qualifications, and apprenticeships) have a high threshold for approval.<sup>11</sup> Occupational standards provide an assured, stable base for technical education.

At the point that skills are emerging, there is often not a broad range of employers utilising those skills, nor widespread experience of teaching and assessing those skills among providers and awarding bodies. By using responsive provision to quickly develop content to meet emerging skills need, we can grow the number of people learning those emerging skill sets and define the knowledge, skills and behaviours that enable someone to be job-ready in a new area, providing a proof of concept to providers, employers, and the wider skills system.

Responsive provision such as Skills Bootcamps and the inclusion of additional specialist qualifications offer a means to support and prepare the skills system for incoming emerging skills as they become more widespread. There is a flow of insight, skills and content from more rapid responses through to the underpinning occupational standards, informing their development over the medium to long term, where occupational standards act as a stable base.

### **Rapid response (0-12 months):**

- Work with the Department for Education to explore short, responsive courses to quickly meet need (e.g., provide advice on Skills Bootcamps to deliver emerging skills not currently in occupational standards)

### **Intermediate action (12-24 months):**

- Annual update of content in quals (e.g., T Levels)



- Approve new additional specialist qualifications and introduce additional content (not yet in standards) within post-16 technical qualifications where needed
- Provide awarding bodies with emerging skills insight through employer strategic guidance and pre-defined areas (post-16)

#### Embed into occupational standards and technical qualifications (2-5 years):

- Develop and introduce new and revised occupations and occupational standards
- Commission and approve new and revised technical qualifications aligned to standards

**IfATE's aim is to ensure a future-facing skills and technical education system which supports employers to meet their future skills needs, reducing the risk of skills gaps and shortages.**

Our three future-facing principles

- **Achieve dynamism and stability.** Use a range of responses to emerging skill need to ensure that more rapid skills provision meets need in the short term, while informing and preparing for longer term updates to occupational standards, apprenticeships, and technical qualifications.
- **Make data-informed, employer-led decisions.** Apply insight and intelligence on emerging innovation and labour market changes to apprenticeships and technical education qualifications. Use a range of responses to test demand and quickly respond to need. In this way, ensure IfATE's occupational standards, apprenticeships, and technical qualifications remain up to date, meeting employers' current and future skills needs.<sup>12</sup>
- **Lead by example and play our part in the system.** Encourage and harness innovation through IfATE's culture, practices, and strategic goals. Embed innovative behaviour and principles in internal business. Proactively engage with employers, providers, awarding bodies, innovators, technologists, researchers, and beyond to gather and share insight on emerging skills. Use our external voice and influence to promote that insight with our stakeholders and partners. By doing so, support the readiness of the wider skills and labour market landscape

There are actions already achieved that set us in good stead:

- ✓ Our recent [Climate Change and Environmental Skills strategy](#) set out commitments and targets for the greening of apprenticeships, T Levels, and Higher Technical Qualifications: we have already met and exceeded those targets, playing our part in supporting the country to meet net zero ambitions;

- ✓ We have revamped our occupational standards revisions process to increase pace and responsiveness;
- ✓ We have responded to employer need for flexible skills provision, working with the Department for Education to create a “pathway to accelerated apprenticeships” where Skills Bootcamps are specially designed for participants to move on to an apprenticeship, which is reduced in duration by at least 3 months<sup>1</sup>;
- ✓ We have developed our approach to establishing employer demand for Level 2 and 3 qualifications which requires awarding bodies to demonstrate how they have gathered evidence that their qualification suitably covers any emerging skills needs;
- ✓ We have established strategic partnerships with innovators, technologists, and researchers including the [Unit for Future Skills](#) (UFS), [Innovate UK](#), the Workforce Foresighting Hub, and the [Catapult Network](#), in order to bring cutting edge emerging technology and skills insight into IfATE to inform and future proof occupational standards, apprenticeships and technical qualifications;
- ✓ We have used the expertise of our employer panels to produce a [Digital Skills Framework](#) and [Sustainability Framework](#) to support employer groups in developing future-proofed digital and sustainable content in occupational standards across our routes;
- ✓ We have provided expert inputs to Ministers on apprenticeship and technical education, including in support of emerging and future skills need, Skills Bootcamps and the Ministerial Green Jobs Delivery Group.

Here are just some examples of where we have identified and met emerging skills need in our occupational standards.

### **Battery Manufacture Technician**

Battery Manufacture Technician has been added as an option to Science Manufacturing Technician (Level 3) to reflect technological developments in response to the challenge of net zero.

### **Artificial Intelligence (AI) and Digital and Technology Solutions standards**

Introduced and updated standards including AI Data Specialist and Digital and Technology Solutions Specialist – these occupational standards provide a skilled workforce able to harness artificial intelligence, develop innovative technological strategies, and lead digital transformation.

### **Installation Electrician and Maintenance Electrician standard**

The Installation Electrician and Maintenance Electrician has been revised and updated to include training people to maintain domestic heat pumps, solar panels, and Electric Vehicle (EV) charging points.

<sup>1</sup> All apprenticeships are required to have a minimum duration of 12 months, even with this reduction.

And here are some examples of innovative approaches to future development.

### **Quantum and hydrogen technologies**

IfATE is working with the Workforce Foresighting Hub and leading research and development organisations to support strategic planning for disruptive technologies that will require new skillsets for the future workforce across a range of sectors. For example, we are modelling the impact of quantum and hydrogen technologies across key routes, looking at innovative ways of working with employers to understand the influence those technologies might have on occupational standards.

### **A range of provision to meet employer skills need**

In response to employer demand for rapid skills training, we are looking at increasing the options for shorter, responsive skills provision mapped to our occupational standards, including Skills Bootcamps to meet short term need and 'additional content' in Level 2, 3, and Higher Technical Qualifications (where a need is identified for content not yet in IfATE's occupational standards) – this model allows for flexible and fast inclusion of content, with insight ultimately feeding through to IfATE's standards.

### **Supporting regional responsiveness**

We are developing strategic regional partnerships in order to support local skills planning and priorities to ensure that regional skills need, and the geographic dispersal of emerging technologies and skills, are understood and supported through our national standards. To this end, we are exploring the possible avenues and requirements for the inclusion of 'regional responsive' characteristics in technical qualifications.

“Innovation and technology are our future. They hold the keys to everything from raising productivity and wages, to transforming healthcare, reducing energy prices, and ultimately creating jobs and economic growth in the UK”

Science, Innovation and Technology Secretary Michelle Donelan

## Section 1: What are innovation skills and emerging skills?

What are innovation skills?

The UK Innovation Survey (BEIS 2021), lists the following as examples of innovation:

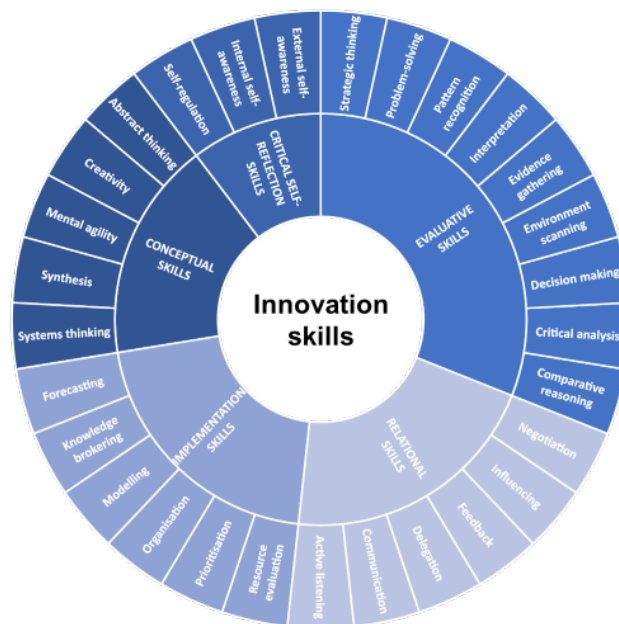
- The introduction of a new or significantly improved product (good or service) or process
- Engagement in innovation projects not yet complete, scaled back, or abandoned
- New and significantly improved forms of organisation, businesses structures or practices, and marketing concepts or strategies
- Investment activities in areas such as internal research and development, training, acquisition of external knowledge or machinery and equipment linked to innovation activities

Innovation skills are personal capacities that can add value to a process, organisation, or endeavour and can be enhanced through learning and development that contribute to the completion of innovation-related tasks.

The *innovation skills framework*, developed by the Innovation Caucus on behalf of Innovate UK, and with input from IfATE, identifies stages of the innovation process (prospecting, ideating, selecting, and implementing), tasks associated with each stage, and then maps the sets of skills that underpin effective performance of these tasks.

The aggregation of these skills into five groups - conceptual skills, implementation skills, relational skills, evaluative skills, and critical self-reflection skills - is the foundation of the framework. While these skills are not unique to innovation, developing the component skills together can create conditions to enhance innovation potential and performance across occupations and the organisation.

Figure 2: innovation skills



Source: Nelles et al. 2023<sup>13</sup>



What are emerging skills?

IfATE defines emerging skills as skills and technologies that have been identified as impacting the nature of occupations in the short/medium term (between 2 to 5 years).<sup>14 15</sup> They may already be in use by early adopters and specialist organisations.

The driver for these emerging skill sets could include:

- technological change and the adoption of new technologies, for example, digitisation of the workplace;
- political or social drivers, for example, the move towards net zero, legislation around insulating properties or the move to electric vehicles;
- changing workforce demographics.

The impact could be a change in the way a role is carried out, a new role being developed or a previous role or task becoming obsolete. The impact might be seen across one or multiple sectors or be specific to an occupation.

Figure 3: current, emerging, and future skill needs



## Section 2: The importance of innovation skills and emerging skills

We face changes that will transform society and with it, the world of work.<sup>16</sup> A study undertaken by McKinsey found that by 2030, nine in ten employees will need to acquire new skills.<sup>17</sup> Put simply, we must do things differently, whether to tackle climate change, ensure equitable access to good jobs, or drive economic growth for the benefit of all. In parallel employers and workforce must stay globally competitive, responding to an increasingly rapid pace of technological change including automation, robotics, and AI, as well as an urgent green transformation.<sup>18</sup>

How society responds will inform how those challenges are met. And innovation is critical to a successful response. Those skills identified by the Innovation Caucus that support innovation execution, innovation management and innovation adoption, such as creativity, strategic thinking, problem solving and communication, are the skills that will support employers to harness, and pioneer, new technology, transition to green ways of working, and drive increased productivity.<sup>19 20</sup>

“We are committed to working with employers, innovators, researchers, technologists and the wider skills system to understand the emerging skills the workforce requires. We are keen to use a model that sees a range of responses working together to meet need, wherever businesses are in the country, from short courses like Skills Bootcamps, to the updating of our occupational standards.”

Rachel Cooper and Beth Chaudhary, Strategy Directors, IfATE

IfATE’s Strategic Plan 2021 – 2024 identifies the importance of identifying and meeting emerging skills needs to our overarching priority ‘delivering for employers’.<sup>21</sup> Our approach and commitments, which follow, share more detail on our actions and future plans to ensure IfATE’s occupational standards, apprenticeships and qualifications anticipate and meet employers’ current and emerging skills need.

### Diversity and Innovation

Evidence shows that organisations work more effectively and creatively when they have people from different backgrounds working together.<sup>22 23 24</sup> It also shows increased economic output and innovation; innovation thrives on diversity of thought.<sup>25</sup> By offering varied and new perspectives, diverse workforces break down barriers to the benefit of individuals, employers and the overall economy.

Equity, diversity and inclusion is built into our organisational DNA. Our recent [Equity, Diversity and Inclusion Strategy](#) sets out the work IfATE is doing to make technical education, and the emerging skills, innovations and occupations of the future, accessible to everyone.<sup>26</sup>

## Section 3: Our commitments

This section outlines our actions and future plans to embed innovation and emerging skills across our processes and in technical qualifications and apprenticeships. We have structured our commitments around the themes: 'Technical qualifications and apprenticeships', 'Partnerships' and 'Our organisation'. The current set of commitments takes us through to 2025. At that point we will review progress and set out planned next steps.

### Technical qualifications and apprenticeships

#### **Commitment 1: Apply data-led decision making**

Implement an enhanced model for data-led decision making with the use of key data and intelligence from foresighting, innovation, research, and across the skills system to inform the review and development of occupational standards, with emerging skills insight embedded into our apprenticeships and technical qualifications, aligned with our [Climate Change and Environmental Skills Strategy](#).

#### **Commitment 2: Explore the use of rapid responses to test and prepare the way for the longer term embedding of emerging skills in occupational standards and technical qualifications**

Our employers tell us they have a range of skills needs, some of which need to be met rapidly and in the short term. We will work with the Department for Education to explore how shorter, responsive provision, such as Skills Bootcamps, can deliver emerging skills not yet included in occupational standards, allowing employers to quickly meet skills needs and gaps in their workforce.

We will learn from the development and content of short, responsive emerging skills provision with that insight, and skills content, ultimately feeding through to IfATE's occupational standards, apprenticeships, and technical qualifications.

#### **Commitment 3: Use the Innovation Caucus's innovation skills framework**

The Innovation Caucus, on behalf of Innovate UK, have developed an *Innovation Skills Framework*, identifying skills that support innovation execution and management such as creativity, strategic thinking, problem solving and communication. These are the skills that will support employers to harness, and pioneer, new technology, transition to green ways of working, and drive increased productivity. IfATE and our employers have contributed to its development.

We will take forward the findings of the Innovation Caucus's *Innovation Skills Framework*, considering how IfATE can best implement and benefit from the research.

**Commitment 4: Continue to enhance and use our Digital Skills Framework**  
Continue to enhance and develop our [Digital Skills Framework](#), anticipating and keeping pace with change, using the expertise of digital experts to support all occupations.

## Partnerships

**Commitment 5: Build strategic partnerships to gather insight and foresight emerging skills and future workforce requirements**

Build on our active strategic partnerships with the Unit for Future Skills, Innovate UK, and Green Jobs Delivery Group, accessing key insight and intelligence and as leading participants of future skills research. Use the insight and intelligence we gain to future-proof our apprenticeships and technical qualifications and work in partnership with the awarding and provider sector to support and prepare for emerging skill need.

**Commitment 6: Actively participate in cross-governmental skills groups**

Act as critical members of cross-governmental skills forums, including the Workforce Foresighting Hub, aligning IfATE strategy and planning with wider national commitment to innovation and economic growth.

**Commitment 7: Develop regional partnerships to support local skills planning**

We recognise that different regions of England have emerging skills needs and priorities most appropriate to their geography, economy, and people, which IFATE will seek to understand and support through our national standards. We will continue to develop strategic regional partnerships to support local skills planning and development.

**[Unit for Future Skills](#) Local Skills Dashboard**

The [dashboard](#) is a hub for up-to-date information and data on local skills, education and employment, and includes:

- **An overview of leading indicators on local economy and skills.**
- **Searchable map where you can find leading indicators on local economy and skills.**
  - Including new data published by the Office for National Statistics (ONS) on [online job adverts](#), split by profession and local area. The ONS are looking to improve this data and welcome feedback through their [survey](#).
- **Links to additional local data sources and tools.**
- **Bespoke download of dashboard data** to enable further analysis and sharing.



## The Workforce Foresighting Hub

“Innovate UK has invested in an approach to workforce foresighting which enables the UK to create the skills needed to attract and retain talent; to authoritatively communicate and work in partnership with stakeholders to ensure the training and learning ecosystem operates collaboratively with the innovation ecosystem; and, to create the talent pipeline needed to ensure the UK has the capability to be an innovation superpower.

IfATE has an integral role in the foresighting process, ensuring the prioritisation of areas where workforce foresighting is most needed to respond to the challenges businesses will face. IfATE is also part of the collective solution, receiving the data and insights produced through the foresighting process to create a meaningful skills response as part of the solution to the challenge. By taking an active role at the point of technological development the ability to create skills solutions at the time of technology adoption becomes a realistic aspiration and brings together supply and demand.”

Debbie Johnson, Head of Innovation, Talent and Skills, Innovate UK

## Our organisation

### **Commitment 8: Embed IfATE’s internal Digital Strategy to support internal innovation**

Embed IfATE’s internal Digital Strategy, an organisational roadmap which will:

- transform how we use external and internal data to plan and evaluate our activity;
- create new and intelligent tools to support our processes;
- draw on digital solutions to:
  - transform the way we engage employers;
  - develop high-quality, relevant technical qualifications and apprenticeships; and
  - enable careers across and between different routes and occupations;
- explore innovative ways to structure our standards, allowing for the fast updating of certain elements likely to require revision in response to changing technology and an agile skills market.

### **Commitment 9: Continue to update and enhance the Occupational Maps**

Continue to enhance and update our occupational maps and search tools. Build on our review of underpinning data, design and functionality. Allow employers and wider users to easily identify occupations, apprenticeships and progression pathways. By doing so, support employer and user need now and in the future.

## Appendix: About the Innovation Skills Framework

The innovation skills framework has been developed by the Innovation Caucus on behalf of Innovate UK, and with input from IfATE and IfATE employers. The framework was developed with a number of aims in mind:

- To help **IfATE** embed innovation skills into the development of apprenticeship standards.
- To provide a framework for **employers** seeking to understand which skills to develop to enhance performance across the innovation process.
- To inform **policy** and provide strategic recommendations for government departments developing plans for delivery around innovation skills.

Innovation skills are personal capacities that can add value to a process, organisation, or endeavour and can be enhanced through learning and development that contribute to the completion of *innovation-related tasks*. The innovation skills framework identifies tasks associated with the innovation process and then maps the sets of skills that underpin effective performance of these tasks. The aggregation of these skills into five groups - conceptual skills, implementation skills, relational skills, evaluative skills, and critical self-reflection skills - is the foundation of the framework. While these skills are not unique to innovation, developing the component skills together can create conditions to enhance innovation potential and performance across occupations and the organisation.

This framework has the potential to positively impact employer skills gaps, productivity, and innovation and through ongoing interaction with employers we are still learning about the different ways that they anticipate applying it. The uses envisioned so far fall into three broad categories:

- **Supporting structural evaluation and planning** by helping organisations to identify potential innovation skills gaps.
- **Informing human resources policies and practices** by providing a framework of innovation skills to support employee recruitment and selection, and performance review and management.
- **Designing training and skills development programmes** to plug innovation skills gaps and to develop innovation mindsets at the individual and organisational level.

## Acknowledgements

In producing this strategy we've benefited from many others' research, expertise, input, advice, and ideas. We would like to thank those whose work supported the strategy and who engaged, reviewed various drafts and gave us invaluable input and feedback, including Dr Jen Nelles and all at the Innovation Caucus, Paul Shakspeare and the Workforce Foresighting Hub, the Catapult Network, Debbie Johnson and all at Innovate UK, Emily Eisenstein and all at Unit for Future Skills, Anna Williams and colleagues at the Department for Education, Daniel Sandford-Smith at Gatsby, and of course our employers and Trailblazer and Route Panel members for their commitment, time, and insight.

At IfATE, we'd like to thank all our colleagues who have provided input and help at various stages in this project.



## References

- <sup>1</sup> Department for Science, Innovation, and Technology, 2023, Science, innovation and technology takes a top seat at cabinet table. <https://www.gov.uk/government/news/science-innovation-and-technology-takes-top-seat-at-cabinet-table>
- <sup>2</sup> Department for Science, Innovation, and Technology, 2023, Plan to forge a better Britain through science and technology unveiled. <https://www.gov.uk/government/news/plan-to-forge-a-better-britain-through-science-and-technology-unveiled>
- <sup>3</sup> Department for Business, Energy and Industrial Strategy, 2021, UK Innovation Strategy: leading the future by creating it. <https://www.gov.uk/government/publications/uk-innovation-strategy-leading-the-future-by-creating-it/uk-innovation-strategy-leading-the-future-by-creating-it-accessible-webpage>
- <sup>4</sup> Institute for Apprenticeships and Technical Education, 2023, IfATE Climate Change and Environmental Skills Strategy. <https://www.instituteforapprenticeships.org/media/6806/ifate-climate-change-and-environmental-skills-strategy-action-plan.pdf>
- <sup>5</sup> Department for Education, 2022, Labour market and skills demand horizon scanning and future scenarios research report. [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/1077930/Labour\\_Market\\_and\\_Skills\\_Demand\\_Horizon\\_Scanning\\_and\\_Future\\_Scenarios\\_FINAL.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1077930/Labour_Market_and_Skills_Demand_Horizon_Scanning_and_Future_Scenarios_FINAL.pdf)
- <sup>6</sup> McKinsey and CBI, 2020, Learning for life: funding a world-class adult education system. <https://www.cbi.org.uk/media/5723/learning-for-life-report.pdf>
- <sup>7</sup> Department for Business, Energy and Industrial Strategy, 2021, UK Innovation Strategy: leading the future by creating it. <https://www.gov.uk/government/publications/uk-innovation-strategy-leading-the-future-by-creating-it/uk-innovation-strategy-leading-the-future-by-creating-it-accessible-webpage>
- <sup>8</sup> Department for Education, 2021, Skills for Jobs: Lifelong Learning for Opportunity and Growth. [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/957856/Skills\\_for\\_jobs\\_lifelong\\_learning\\_for\\_opportunity\\_and\\_growth\\_web\\_version\\_.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/957856/Skills_for_jobs_lifelong_learning_for_opportunity_and_growth_web_version_.pdf)
- <sup>9</sup> High Value Manufacturing Catapult and Gatsby, 2020, Manufacturing the Future Workforce. <https://hvm.catapult.org.uk/wp-content/uploads/2022/06/Manufacturing-the-Future-Workforce-Full-Report.pdf>
- <sup>10</sup> J. Nelles, B. Verinder, K. Walsh, T. Vorley, 2023, The Productivity Institute, Skills Innovation and Productivity: The Role of Further Education Colleges in Local and Regional Ecosystems
- <sup>11</sup> IfATE, Occupational Standards. [Developing an occupational standard / Developing new apprenticeships / Institute for Apprenticeships and Technical Education](#)
- <sup>12</sup> Department for Education, 2023, Labour market information and an assessment of its applications: a series of international case studies. [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/1137441/Labour\\_market\\_information\\_and\\_an\\_assessment\\_of\\_its\\_applications.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1137441/Labour_market_information_and_an_assessment_of_its_applications.pdf)
- <sup>13</sup> Jen Nelles, Nick Wilton, Kevin Walsh, Tim Vorley, Innovation Caucus, 2023, Innovation Skills Framework.
- <sup>14</sup> High Value Manufacturing Catapult, the Skills Value Chain. <https://hvm.catapult.org.uk/case-study/the-skills-value-chain>



- 
- <sup>15</sup> High Value Manufacturing Catapult and Gatsby, 2020, Manufacturing the Future Workforce. <https://hvm.catapult.org.uk/wp-content/uploads/2022/06/Manufacturing-the-Future-Workforce-Full-Report.pdf>
- <sup>16</sup> PwC, Megatrends. [Megatrends - Issues - PwC UK](#)
- <sup>17</sup> McKinsey and CBI, 2020, Learning for life: funding a world-class adult education system. <https://www.cbi.org.uk/media/5723/learning-for-life-report.pdf>
- <sup>18</sup> Department for Education, 2022, Labour market and skills demand horizon scanning and future scenarios research report. [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/1077930/Labour Market and Skills Demand Horizon Scanning and Future Scenarios FINAL.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1077930/Labour_Market_and_Skills_Demand_Horizon_Scanning_and_Future_Scenarios_FINAL.pdf)
- <sup>19</sup> Jen Nelles, Nick Wilton, Kevin Walsh, Tim Vorley, Innovation Caucus, 2023, Innovation Skills Framework.
- <sup>20</sup> Department for Education, 2021, Skills for Jobs: Lifelong Learning for Opportunity and Growth. [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/957856/Skills\\_for\\_jobs\\_lifelong\\_learning\\_for\\_opportunity\\_and\\_growth\\_web\\_version\\_.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/957856/Skills_for_jobs_lifelong_learning_for_opportunity_and_growth_web_version_.pdf)
- <sup>21</sup> IfATE, 2021, Strategic Plan 2021-2024. <https://www.instituteforapprenticeships.org/media/5632/strategic-plan-2021-2024-final-1.pdf>
- <sup>22</sup> Innovate UK, 2020, Supporting Diversity and Inclusion in Innovation. <https://www.gov.uk/government/publications/supporting-diversity-and-inclusion-in-innovation-study>
- <sup>23</sup> McKinsey, 2015, Why diversity matters. <https://www.mckinsey.com/~media/mckinsey/business%20functions/people%20and%20organizational%20performance/our%20insights/why%20diversity%20matters/why%20diversity%20matters.pdf>
- <sup>24</sup> Institute for Apprenticeships and Technical Education, 2023, Equity, Diversity and Inclusion Strategy. <https://www.instituteforapprenticeships.org/about/operational-plans/equity-diversity-and-inclusion-strategy/>
- <sup>25</sup> Financial Conduct Authority, 2021, Review of research literature that provides evidence of the impact of diversity and inclusion in the workplace. <https://www.fca.org.uk/publication/research/review-research-literature-evidence-impact-diversity-inclusion-workplace.pdf>
- <sup>26</sup> Institute for Apprenticeships and Technical Education, 2023, Equity, Diversity and Inclusion Strategy. <https://www.instituteforapprenticeships.org/about/operational-plans/equity-diversity-and-inclusion-strategy/>

