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Learnings from WorldSkills Lyon and beyond

Insights from benchmarking UK skills against global standards

Pearson

Official partner of Team UK

WorldSkills Lyon 2024

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About WorldSkills UK

WorldSkills UK is a four nations partnership between education, industry and UK governments. It is a world-class skills network acting as a catalyst for:

Raising standards: through international benchmarking and professional development.

Championing future skills: through analysis of rapidly changing economic demand.

Empowering young people, from all backgrounds: through competitions-based training and careers advocacy.

Pearson

About Pearson plc

At Pearson, our purpose is simple: to help people realize the life they imagine through learning. We believe that every learning opportunity is a chance for a personal breakthrough. That's why our c. 18,000 Pearson employees are committed to creating vibrant and enriching learning experiences designed for real-life impact. We are the world's lifelong learning company, serving customers in nearly 200 countries with digital content, assessments, qualifications, and data. For us, learning isn't just what we do. It's who we are. Visit us at pearsonplc.com.

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Acknowledgements

Our thanks to everyone who has contributed to this report. In particular, our thanks to Atif Shafique who curated our international case studies with Brazil, Austria and Switzerland; the representatives from SENAI in Brazil, Skills Austria and Swiss Skills who provided their insights for these case studies; and all WorldSkills UK's Training Managers whose expertise and insights have informed this report.

Foreword

Ben Blackledge
Chief Executive,
WorldSkills UK

The UK's ability to develop world-class skills is vital to opportunity and growth. That is why WorldSkills UK works with employers, colleges, universities, and independent training providers to help raise standards in technical education and apprenticeships across the UK. Our ability to do this comes directly from our involvement in WorldSkills International – a movement that has pioneered the development of world-class skills through global skills competitions for over seventy years.

Team UK's top ten finish at the latest of these competitions, WorldSkills Lyon 2024, shows that we know what it takes to reach the highest global standards in technical and vocational skills, which are critical for the UK economy. The purpose of this report is to share the insights from WorldSkills Lyon so that we can help embed world-class skills development into the grass roots of technical education right across the UK, to benefit thousands of young people as they start their careers.

From my point of view there are three trends in international skills development covered in this report that warrant further discussion for anyone involved in technical skills development.

Firstly, WorldSkills events are successful because they recognise the unique value of technical and vocational education, testing the skills that employers need: excellent technical skills combined with employability skills. Skills competitions provide a valuable model for how we can replicate this at the national level with curricula that is in line with employer demand alongside assessment that provides real rigour.

Secondly, there is an opportunity to think differently about collaboration between technical education providers and employers in how we deliver and maintain high standards in technical education. The short international case studies in this report show that dual professionalism is a fundamental feature of skills systems in many other countries, with employers working simultaneously in industry and education bringing huge benefits to both.

"WorldSkills events are successful because they recognise the unique value of technical and vocational education"

Thirdly, the pursuit of excellence, which underpins the philosophy of WorldSkills, needs to be in the DNA of our national skills systems. WorldSkills UK's programmes are designed to help all young students and apprentices aim for excellence rather than competence, so that they can land successful careers and bring innovation, leadership and productivity to their future places of work.

My thanks to Pearson for their partnership for Team UK, all the organisations who contributed to this report, our international skills experts and every member of Team UK who have given us the opportunity to learn so much over the past two years.

Ben Blackledge
Chief Executive, WorldSkills UK

Foreword

Freya Thomas Monk
Managing Director, Vocational Qualifications & Training, Pearson plc

The 2024 WorldSkills UK Benchmarking & Insights Report arrives at a pivotal moment for the UK's skills agenda. The recent Skills England: Driving Growth and Widening Opportunities report reveals that over 2.5 million roles, primarily in health, social care, engineering, and science, are understaffed, with over 90% requiring specialised training. Our own Skills Map of England forecasts that by 2027, automation and augmentation do not necessarily mean fewer jobs – but different jobs, necessitating that around 2 million people will need to reskill or upskill.

WorldSkills Lyon showcases vocational training models that could help the UK better prepare its young people for the workforce. For instance, the Netherlands' flexible occupational standards respond swiftly to industry needs, a system the UK could adapt by balancing a stable set of national skills with regional flexibility.

Countries like France and Singapore use project-based training to develop technical skills alongside critical thinking and collaboration. The BTEC model in the UK shares this approach, combining experiential learning with practical assessments to develop employability and transferable skills.

For effective impact, these skills need strong teaching and assessment methods. Austria's vocational teachers work part time in industry to maintain relevant skills and collaborate with peers to improve standards. Enhancing the professional networks and ongoing development of UK teachers is essential.

The UK is the home of technical, professional and vocational qualifications which are in demand the world over – BTECs carry a high status in the international labour market, and T Levels are destined to do the same. But no one country has a monopoly on excellence. Boosting the UK's global competitiveness by learning from countries excelling in vocational education has never been more urgent.

> "Boosting the UK's global competitiveness by learning from countries excelling in vocational education has never been more urgent"

Pearson is committed to supporting WorldSkills UK in raising standards in apprenticeships and technical education. We are collaborating with educational providers, industry leaders, and policymakers to reshape curricula and align skills with the needs of today's and tomorrow's job markets.

The outstanding performance of young people in the UK's skills system this year is a true point of pride. But ensuring the next generation has access to the opportunities they deserve will take a united effort - providers, employers, educators, and policymakers working together. This report provides valuable insights to support this goal. By learning from global leaders in skills development, we can keep the UK at the cutting edge, shaping a brighter, more inclusive future for all.

Freya Thomas Monk
Managing Director, Vocational Qualifications & Training, Pearson plc

Introduction

This report contains insights on world-class skills development, gathered by WorldSkills UK, as a key member of the WorldSkills International movement, which now has 89 country members. Following the most recent 'skills olympics' event WorldSkills Lyon 2024, it provides fresh evidence on how skills policy and practice is changing across the world, based on insights gathered since we published our first international benchmarking report in early 2023.

In line with WorldSkills UK's strategic objectives, our aim is to raise standards in technical education and apprenticeships through international benchmarking to help young people and employers get the skills they need and to boost the UK economy.

These insights have been drawn together from:

- Twenty-two structured research interviews with WorldSkills UK Training Managers and WorldSkills International Skills Experts.
- WorldSkills UK's International Skill Insights setting out latest developments in each of the skills WorldSkills UK competes in internationally.
- Interviews and bilateral meetings with government officials and WorldSkills colleagues from 12 nations.
- A roundtable discussion attended by leading skills sector and industry experts from across the UK, reflecting on what they had learned from observing international skills competitions at WorldSkills Lyon 2024.
- Case studies exploring how countries that rank highly in WorldSkills events approach workforce development in their technical and vocational education and training sectors.

The report contains the following sections:

Part 1: WorldSkills provides a unique opportunity to benchmark UK skills

This section makes the case that:

- world-class skills are key to opportunity and growth in the UK
- UK governments are recognising the importance of skills
- international benchmarking is integral to raising standards in skills
- the UK is a leader on skills and we can improve by learning from other countries.

Part 2: System-level insights from international comparisons

This section provides three country case studies, focusing on their approach to building links between education and industry to ensure that their TVET systems stay up to date with industry needs

Part 3: The latest trends in skills that are vital for the UK's growth

This section includes insights on skills policy and practice in eleven skill areas across five sectors: Advanced Manufacturing, Digital Infrastructure, Green Industries, Creative Industries, Health and Social Care.

Part 4: Conclusion and next steps: partnering with WorldSkills UK to develop world-class skills in the UK

This section summarises the key learnings from recent international benchmarking insights and highlights ways in which education and industry partners can work with WorldSkills UK to develop world-class skills.

This report collectively defines all forms of technical education, vocational study, work-based training, and apprenticeships as 'technical and vocational education and training' – abbreviated to TVET.

WorldSkills provides a unique opportunity to benchmark UK skills

World-class skills are key to opportunity and growth in the UK

Developing world-class skills in the UK is one of the most important ways that we can grow our economy. High quality technical skills are vital for technology adoption, innovation, resource management and many other key elements of a more productive economy, which the UK needs to increase GDP and living standards. The UK economy today is still held back by skills gaps, and as technology develops and new roles are created, it is vital to have insights on how other countries are developing the world-class skills that all our economies need.

World-class skills can also create opportunities for young people, giving them a sense of ambition and aspiration in choosing a technical career route. Seeing the success of Team UK can inspire other young people to gain higher qualifications and take on exciting roles in growing sectors. In our evaluation of WorldSkills Lyon 2024 all members of Team UK said the experience had improved their technical skills and it had also increased their personal and employability skills. At a national level this impact is replicated with 94% of the young people in our national finals in 2023 reporting that the experience had increased their technical skills and 88% said it had increased their personal and employability skills. Independent research has also shown that the average earnings of young people who'd taken part in our national and international competition programmes were 60% higher than those who hadn't taken part. Developing higher level skills can also help young people from all backgrounds get the best start in life.

"WorldSkills UK elevates technical learning in a way you can't and shouldn't ignore."

Alun Francis, Chair of the Social Mobility Commission, commenting on the impact that WorldSkills UK's programmes have

WorldSkills UK's vision is to use global standards of excellence in technical skills to build a world class skills economy

The WorldSkills competition model also provides a rigorous way of assessing vocational and technical skills in a way which is different from academic modes of assessment. Competition provides an environment where technical and employability skills can be tested in scenarios that simulate the workplace and give future employers a much better idea of skill levels and ability than theoretical assessments. This should be a vital aspect of how we build up the UK's technical skills to power both growth and opportunity.

WorldSkills UK's vision is to use global standards of excellence in technical skills to build a world class 'skills economy[1]' in the UK, working alongside our already world-leading knowledge economy, giving all young people a prestigious route for their education and training and investing in our human capital to support economic growth.

UK governments recognise the importance of skills

The UK has an ideal platform on which to build a world-class skills economy, where the importance of skills to growth and prosperity is recognised by the governments of all four nations.

The Department for Education in England plans to introduce Technical Excellence Colleges and has announced the launch of Skills England to support the ambition of boosting the nation's skills.

"Businesses need a highly skilled workforce to draw on if they are to drive economic growth and expand opportunity in our communities.[2]"

Bridget Philipson MP, Secretary of State for Education

The Secretary of State has also announced a wide-ranging curriculum and assessment review which is designed to drive 'high standards' and prepare young people for 'life and work'.

The Welsh Government aims to deliver a skills sector globally renowned for excellent education and training[3] through its new Commission for Tertiary Education.

The Scottish Government has recently been consulting on reforms to its skills landscape with the Minister for Higher and Further Education Graeme Dey MSP, noting that, "Equipping people with the knowledge and skills they need to thrive in life and the world of work is key to our vision to deliver a strong and resilient economy and society.[4]"

1 Exploring the skills economy (2021), WorldSkills UK
2 Skills England: driving growth and widening opportunities (gov.uk/government/publications)
3 How will the establishment of the Commission for Tertiary Education and Research affect FE institutions? – Factsheet (2024), Welsh Government
4 Post-school education and skills reform legislation: consultation - gov.scot (www.gov.scot)

In Northern Ireland, the Executive has announced new action plans co-designed with industry to support growth in high-priority sectors including advanced manufacturing, life sciences and the screen industries[5] with skills a key element of all seven sector plans.

With such alignment of policy and political opinion on the power of high quality skills to increase national prosperity there should be real potential to learn from how other countries develop world-class skills and raise standards in technical education and apprenticeships even further across the UK.

International benchmarking is integral to raising the standards of UK skills

International benchmarking is an important source of insights on how we can raise standards in technical education and apprenticeships back in the UK

The UK's membership of the WorldSkills International movement, through WorldSkills UK, provides a unique method of benchmarking the quality of skills being developed in the UK and around the world. This benchmarking happens both formally and informally to provide an important source of insights on how we can raise standards in technical education and apprenticeships back in the UK.

Every two years WorldSkills member countries take teams of young people to compete at WorldSkills events where competitors are tested against WorldSkills occupational standards. These international occupational standards are reviewed and updated in consultation with industry to ensure they are fit for purpose and in line with the latest global industry trends and technologies. They provide a baseline from which to measure young people's performance during the international competitions and importantly provide a benchmark for national standards in TVET. WorldSkills UK has the opportunity to review the standards through its network of Training Managers (TMs), who form part of the training team for Team UK and act as global skills experts during the competitions.

5 Sectoral Action Plans (2024), Department for the Economy Northern Ireland

Box 1 WorldSkills UK's international skills expertise

The respect by which the UK is held internationally is reflected in the fact that the UK representative was the chief expert in ten skills for WorldSkills Lyon, giving us additional access to international networks and knowledge of world-class standards in these fields.

Chief Experts:

- Refrigeration and Air Conditioning
- Cabinetmaking
- Cyber Security
- Industry 4.0
- Cooking
- Joinery
- Painting and Decorating
- Chemistry Laboratory Technician
- Robot Systems Integration

Our TMs also pick up insights on how other countries train their competitors and how other countries skills systems work, in the periods between each two-year WorldSkills event. This happens by keeping in touch with their counterparts in other countries, arranging international pressure tests where groups of countries will collaborate on a practice skills competition, and through international exchanges. As the WorldSkills network increases in membership and recognition for developing world-class skills its insights are being used by other international organisations to provide further benchmarking of vocational skills across different countries as explained in Box 2.

Box 2 Building on WorldSkills benchmarking to introduce PISA-VET

For the past two decades PISA tests have helped drive educational policy reform across the world by allowing countries to compare the skills of 15-year-olds in maths, reading, and science. Biennial WorldSkills competitions meanwhile have provided a valuable benchmarking mechanism for technical skills across the WorldSkills network.

The OECD is now piloting a PISA-VET project in collaboration with WorldSkills experts and other stakeholders, and international skills competitions will continue to support the globally standardised assessment of TVET programmes.

This project is being implemented over ten years and seeks to establish a yardstick for comparing quality, equity and efficiency in TVET. By measuring learners' knowledge, skills, attitudes and values, and their ability to apply these in work situations, PISA-VET will provide both a systems level evaluation of performance for technical and vocational occupations, as well as comparable and reliable data on specific programmes within different national contexts.

The Department for Education in England is participating in the pilot phase running between 2026 and 2030 involving 15 countries, with a larger scale assessment phase involving 25 countries following between 2030 and 2034. WorldSkills UK looks forward to supporting this collaborative and innovative effort to inform effective policy making and enhanced teaching and learning. This comes at a pivotal moment. As the world undergoes major structural shifts such as the green and digital transitions, the importance of TVET has never been clearer.

All of the insights our TMs have gathered over the two years since our last report, during the two-year competition cycle featuring the WorldSkills Special Edition 2022, EuroSkills Gdansk 2023 and WorldSkills Lyon 2024, are catalogued in the third part of this report to provide information which we and the rest of the UK skills sector can use to improve the delivery of technical education and apprenticeships.

The UK's technical skills base is respected and competitive

The 47th WorldSkills event took place in Lyon in September 2024, bringing together 1500 competitors from over 69 nations and regions to compete in 62 skill areas, from cyber security and mechatronics to renewable energy.

With 31 competitors across 27 skills, Team UK secured a 10th place finish with two silver medals, two bronze medals, and twelve medallions of excellence[6], equalling the UK's tenth place finish at WorldSkills Special Edition 2022. This position shows that the UK remains internationally competitive in technical skills, and the strength of WorldSkills UK's partnerships with other countries and interest in the UK's skills systems shows that our skills sector is also widely respected and one that other countries are keen to learn from.

Position	Member	Average Point Score	Number of Teams / Competitors	Gold	Silver	Bronze	Medallion for Excellence
1	China	743.69	59	36	9	4	8
2	Korea	723.45	49	10	13	9	11
3	Switzerland	720.59	39	6	6	1	21
4	Chinese Taipei	719.54	50	2	3	10	28
5	Singapore	712.41	29	2	4	2	11
6	Japan	711.43	47	5	5	4	21
7	Austria	710.55	38	3	1	3	21
8	France	709.46	52	6	4	3	24
9	United Arab Emirates	708.31	16	0	1	1	8
10	United Kingdom	707.44	27	0	2	2	12
11	Germany	706.94	35	1	3	1	22
12	Hungary	705.95	21	1	0	2	12
13	Portugal	705.33	12	0	0	0	8
14	Denmark	704.35	17	1	0	1	9
15	South Tyrol, Italy	702.06	17	1	1	1	6
16	Indonesia	698.70	10	1	1	0	2
17	Netherlands	698.39	23	0	0	0	11
18	Brazil	698.21	56	1	4	3	23
19	Australia	697.83	29	0	0	1	14
20	Thailand	696.89	19	1	1	0	5

6 Medallions of Excellence certify the attainment of world-class standards enshrined in WorldSkills international occupational standards

While medals and world positions are not the most important aspect of our involvement in the WorldSkills International movement, it is vital that the UK keeps in touching distance of those countries who are investing heavily in their skills systems so that we can continue to raise standards for thousands more young people across the UK.

WorldSkills UK's two-year training programme for international competition gives young students and apprentices selected to be part of Squad UK the additional technical and mindset training to achieve world-class levels of skills excellence. With new technologies, practices and skills coming online all the time WorldSkills UK is constantly improving its international training programme to keep pace with global best practice. Doing so enables us to include the most transferable parts of our international training programme into our national skills programmes so that more young people across the UK are training for excellence rather than competence.

There is much to learn from other countries to make sure our skills delivery is internationally competitive

The UK's strong performance also gives us a fantastic platform to show the prestige that technical education and apprenticeships in the UK can offer to young people considering a technical route for education and training. Team UK's results can also be used by UK governments and mayoral combined authorities to demonstrate the competitiveness of UK skills to prospective international investors, who rate access to skills one of the top factors influencing their choice of location[7].

While we celebrate the achievements of Team UK in Lyon we know there is much to learn from other countries to make sure that our skills delivery is internationally competitive and in line with the latest employer needs. To help bridge the gap between the UK's technical skills and the best in the world, which is vital to improve our economic competitiveness, WorldSkills UK acts a quality improvement partner within the UK skills sector. We work with educators in colleges, universities and independent training providers to share our knowledge of what it takes to develop technical skills excellence to raise standards in teaching, learning and assessment for thousands of students and apprentices. The third section of this report shares insights from a range of skills in sectors that are vital for the UK's economic growth.

7 Wanted: skills for inward investors - WorldSkills UK

System-level insights from international comparisons

World-class workforce development: three country case studies

The following case studies provide a snapshot of how Brazil, Switzerland and Austria successfully ensure the TVET workforce can meet the changing needs of industry and achieve excellence. These examples build on insights gained over the last two years, plus interviews with WorldSkills representatives from Brazil, Switzerland and Austria – all countries that achieved a top ten place at WorldSkills Lyon 2024.

Given the challenges the UK TVET sector can face in recruiting educators, particularly in roles where skills are in huge demand within industry, these case studies provide useful insights for future policy and practice across the UK.

Longer and more detailed versions of these international case studies will be available on the WorldSkills UK website.

Brazil

TVET in Brazil is led by SENAI - a culturally embedded and long-standing private institution that is governed by industry and funded by an employer levy. As an industry-led and dynamic institution, there are three key mechanisms through which SENAI keeps teachers and trainers up to date:

In Brazil, a significant proportion of teachers work between education and industry, and there are flexible pathways for industry figures to enter into teaching

- Flexible pathways into teaching. A significant proportion of teachers work part time between industry and school. Entry into teaching for apprenticeships also doesn't require formal higher qualifications, with SENAI providing teacher training and qualifications that offer flexible and seamless pathways from industry into teaching.
- A culture of training and professional development for teachers that reinforces their identity and esteem as dual professionals. This includes specialist training and collaborative opportunities such as specialist workshops delivered by industry, as well as continuous training programmes offering industry-led courses, workshops and best practice sharing between industry and trainers.
- Maintaining strategic partnerships with industry is a core function of SENAI and drives TVET workforce development and standards. Such partnerships directly inform curricula and teaching practices. This includes the provision of specialised industry-led training directly to trainers, deployed rapidly when new training needs in the economy emerge.

Whilst being responsive is a strength in a skills system, some stakeholders point to this coming at the expense of a longer-term strategic consideration of economic and workforce needs. However, SENAI has sought to overcome this through R&D and gain an advanced view of future skills through applied research projects. Skills competitions also play an important role in driving excellence and innovation, allowing teachers involved in competitions to learn from cutting edge practices and developing future TVET leaders.

Austria

The governance, coordination and delivery of TVET is managed through a social partnership between government and industry. Austria's dual TVET system includes a mix of vocational education in schools and work in companies. The architecture of the Austrian system allows for the TVET workforce to stay up to date in three ways:

In Austria, teachers collaborate and share knowledge with each other and industry to drive excellence in teaching

- Every teacher in the dual system comes from industry, as there is a requirement to have to have at least three years of professional experience to get into teaching. A significant proportion of the TVET workforce, including 30-40% of trainers, work in industry while teaching part-time.
- Skills fade is not an issue because teachers have a strong dual professional identity. Teachers stay connected to industry through continuous technical training and updating of their skills. This is requested by teachers, delivered by industry and funded by government.

- Teachers collaborate and share knowledge with each other and industry to drive up standards and excellence in teaching. This includes a strong culture of peer-to-peer training, active participation in industry conferences and networking, and teachers mobilizing their industry connections to ensure schools have access to the latest equipment and training methods.

Whilst Austria still faces challenges around teacher shortages, this is mitigated because of the cross-integration between the TVET and industry workforces. Skills competitions also play an important role in further boosting industry-TVET links.

Switzerland

Switzerland has a high-status dual TVET system with a high degree of social coordination between government (which sets education plans); regional cantons (which ensure effective local implementation) and professional organisations (which determine the content of training). This Swiss approach is effective in ensuring the TVET workforce meets skills because:

In Switzerland, there is a culture of company social responsibility and engagement with TVET

- Trainers that deliver apprenticeship and cross-company training come directly from industry. As members of professional organisations, they are also active stakeholders in the process of updating teaching and training plans.
- The TVET system is made up of dual professionals with a high level of industry knowledge and competence. Most trainers are part-time, spending part of their time teaching and the rest working in industry. They are dual professionals rather than professional teachers, and there is a high degree of interoperability between the TVET and industry workforces.
- There is a culture of company social responsibility and engagement with TVET. Companies encourage employees to spend part of their time teaching, recognising it strengthens their brand as a responsible stakeholder while also building new skills within their workforce.

This approach does not come without challenges, with the culture of companies granting employees time off to teach coming under more pressure in recent years. Keeping good teachers in the TVET system has also been flagged as becoming more difficult. This points to the importance of continuously demonstrating the business case for employer engagement with TVET and building the right mix of incentives. Skills competitions act as a platform for continued collaboration and a testbed for innovation, giving teachers opportunities to bring together different professions across Switzerland to mainstream excellence.

System-level insights from WorldSkills Lyon 2024

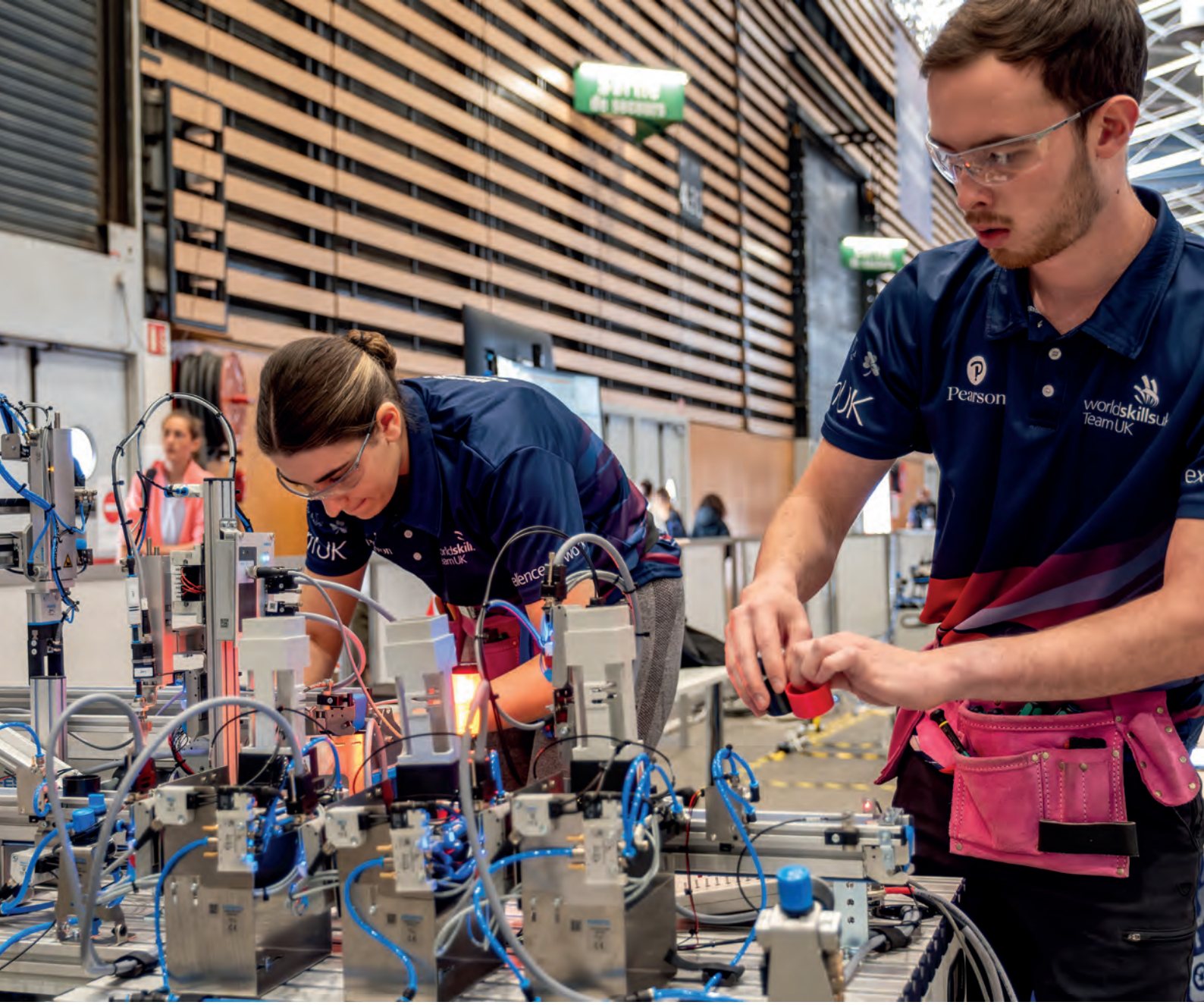
On the final day of competitions at WorldSkills Lyon, WorldSkills UK hosted a roundtable event welcoming representatives from skills providers, awarding organisations, membership bodies, international institutions, and UK governments. This allowed attendees to share their reflections from witnessing world-class skills in action and meeting fellow WorldSkills member countries.

Views on what more could be done to drive technical excellence in the UK

- The pursuit and promotion of technical skills excellence should be in the DNA of the UK skills systems across all levels.
- UK skills systems need to pay as much attention to teaching, learning and assessment as standard setting and systems level change in order to raise standards.
- By harnessing WorldSkills UK's 7-step framework for moving from competence to excellence, more educators in more skills providers can help their students fulfil their full potential and develop the mindset, confidence and motivation to succeed.
- All regions and nations of the UK should be able to replicate inter-campus and local skills competitions which operate in Northern Ireland, Wales, Greater Manchester and other areas, to support staff and student engagement.
- The Netherlands provides exposure to technical education for those under 16, which helps its reputation as a high-value pathway.
- Focusing on cost-effectiveness has perhaps led the UK towards more academic models of assessing technical skills which don't properly assess the skills young people need for employment.
- Greater collaboration could help raise standards eg Institutes of Technology which have access to industry-standard equipment could do work with different partners to support skills in their local area.

Learnings from the policy approaches and performance of other nations

- For some countries there is a less of a gap between the average student/apprentice and their international competitors
- The UK faces a risk of falling behind other countries, particularly in Asia that are investing heavily in skills.
- Dual professionals, defined as professionals who work part-time in industry and part-time as educators, are helping other countries utilise industry-standard equipment in curriculum delivery and provide a clearer line of sight to employment.
- China and Hong Kong refer to technical education as TPET (technical and professional education and training) which might help overcome the false distinction between academic and vocational education and recognise the role of universities in providing technical education.
- Employers in several central European nations have a clear role within their skills systems built on social partnership rather than a more transactional relationship.
- The fast pace of technological change doesn't mean that everything in an occupational standard has to change. The Netherlands structures occupational standards in constituent parts around a strong core, which gives them a more responsive system when qualifications and curriculum need to be updated quickly in response to industry need.
- The UK falls behind many international peers in teaching hours on TVET programmes.



The latest trends in skills that are vital for the UK's growth

This section provides a sample of our skills-specific benchmarking data, collated formally and informally by our Training Manager network, as explained in the first section. It explains skills-specific developments at the WorldSkills International level, plus examples of how other countries are innovating in their skills delivery to achieve world-class standards. For more information on the latest trends from WorldSkills across a wide range of skills please access our International Skill Insights.

Advanced manufacturing

Key insights

- France uses practical and broad approaches to teaching and learning in Mechanical Engineering to achieve high standards.
- The Netherlands' approach to dual professionals and attracting industry figures into teaching is helping build world-class skills in Mechatronics.
- Taiwan is promoting robotics at school age students to build the skills needed for its economy.
- Hungary has a VET 4.0 strategy enabling the transfer of knowledge and skills between education and industry.
- Shape optimisation tools and the ability to generate complex design solutions quickly are becoming more important in additive manufacturing.

Mechanical engineering: CAD

Mechanical engineers are vital to infrastructure development, climate adaptation, and advancing medical tools and devices, to provide just a few examples. Reaching excellence in Mechanical Engineering: CAD involves the creation of complex manufacturing drawings and translating these into detailed 3D models using a range of techniques. The UK possesses some major strengths in delivering these skills, including the deep integration of CAD skills in a range of qualification frameworks and occupational standards. The UK also has a strong ecosystem of companies pushing the boundaries of engineering design technology and supporting the exchange of knowledge and skills between education institutions and industry leaders to ensure training remains up to date.

To build on this our benchmarking data shows that we could learn from the French mode, which involves learners developing broad engineering skillsets from aged 15, with greater specialisation and industry placements after two years. Rather than relying on standardised assessments for all students, employers and young people take an active stake in developing various projects that support more holistic, dynamic and practical approaches to teaching, learning and assessment in real world scenarios. This approach fosters a deep understanding of industry standards and practices whilst developing resilience and problem-solving skills.

The UK has examples of skills providers successfully leveraging industry engagement, practical assessment, and student led projects to raise standards in this area, such as Middlesex University and New College Lanarkshire.

Mechatronics

Mechatronics sits at the intersection of mechanics, electronics and computing and is therefore an essential skillset to the growth in automated manufacturing, which employers in the UK such as Siemens, Toyota and Amazon rely on and support through their apprenticeship programmes.

In some areas of UK teaching, learning and assessment in mechatronics, in comparison with other leading countries, risks being too theoretical and lacks industry input to ensure learners are ready to meet fast-changing industry standards.

WorldSkills UK's mechatronics skills expert identified the Netherlands' as a country that displays international best practice in mechatronics teaching. One significant reason for this is that the Netherlands has an established system of transferring knowledge and skills between industry and TVET. 58% VET teachers work part time allowing them to be employed in an industrial setting within their teaching field[8].

Anticipated technology changes in mechatronics include an increasing focus on cloud infrastructure.

Robot Systems Integration

Greater use of robotics presents huge opportunities for the UK economy and tackling our longstanding productivity puzzle. While UK firms are increasingly using robotics in a range of sectors including retail, logistics and healthcare the UK has the least advanced robotics sector in the G7[9].

WorldSkills UK's training manager is working proactively to support the capacity of the UK TVET sector to meet growing demand for these skills, developing a Robotics Integration module within a Level 5 foundation degree at Northern Regional College, and engaging with Bridgend College, Coleg Menai, and the Manufacturing Technology Centre in Coventry. However, to keep pace with leading countries and deepen the integration of robot systems within UK manufacturing, these initiatives need to be rolled at across more parts of the UK.

The UK can learn from countries such as Taiwan which is starting to teach robotics from a much earlier age in schools. Students interested in robotics from school can then study at advanced technical training centres which are located near relevant industrial clusters. The strength of these training programmes and level of industry involvement result in many students in Taiwan being recruited by industry before their programme ends.

The UK skills systems could also better support the robotics sector by introducing a specific qualification or apprenticeship standard for Robotics Integration, which many other countries have.

8 Teachers and Leaders in Vocational Education and Training (2021), OECD
9 The Economic Impact of Robotics and Autonomous Systems across UK Sectors (2021), BEIS

Industry 4.0

'Industry 4.0' is the next phase in the digitisation of the manufacturing sector, and in the context of WorldSkills competitions, combines mechatronics, cyber security, web design and automation, with competitors required to excel in proof-of-concept programming, HMI design, electrical circuits and pneumatics. These core elements are anticipated to remain vital to successful TVET programmes in the years ahead. However, new technologies will also grow in importance, including those allowing for digital twinning of production lines, and monitoring systems that can optimise energy use as part of efforts to reduce climate change.

In Hungary, the planning, coordination, and continuous monitoring of upskilling for TVET teachers and trainers is encompassed within a VET 4.0 strategy

In Hungary, the planning, coordination, and continuous monitoring of upskilling for TVET teachers and trainers is encompassed within a VET 4.0 strategy, including company placements to learn about changes in skills demand created by Industry 4.0 as well as R&D driven innovations and new digital competencies[10]. The VET 4.0 strategy also prioritises the involvement of industry professionals in teaching and training, curriculum development, competition preparation, and as mentoring for disadvantaged young people[11].

By contrast, research commissioned by WorldSkills UK[12] and insights shared by our TM highlight that UK TVET providers lack trainers able to meet the needs of Industry 4.0. Skills shortages in industry and TVET risk becoming mutually reinforcing, with manufacturers responding to labour market shortages by recruiting TVET staff, and TVET providers less able to meet the needs of manufacturing firms as a result. To address this issue, more must be done to diffuse skills between industry and TVET and update the knowledge and practice of tutors and educators in line with technological and pedagogical innovations.

Additive manufacturing

Additive manufacturing technology has undergone enormous growth over recent years and holds significant potential for further expansion in lieu of shifting global supply chains and its ability to enable firms to make components and precise parts on site. The global 3D printing market is forecast to triple in size between 2022 and 2026, reaching $44.5bn[13]. For the UK to capitalise on this growth and fully harness the potential of additive manufacturing, our ability to deliver the right technical skills will be key.

Developing world-class skills in any discipline means progressing from competence to excellence. Competence in additive manufacturing involves an understanding of 3D printing constraints, and the

10 Teachers and Trainers in a changing world – Hungary (2022), Cedefop
11 Ibid
12 Manufacturing Excellence (2023), Learning & Work Institute/WorldSkills UK/BAE Systems plc
13 3D Printing Trend Report (2022), Hubs

ability to work with Design Polygonal Solutions to create 3D CAD models for printing. Excellence, as demonstrated by the Korean competitor that won the gold medal, means understanding computer aided engineering to an advanced level to utilise shape optimisation tools and generate complex design solutions quickly. This is particularly important in manufacturing industry environments, where engineering tolerance is next to zero and global competition requires efficiency and high standards.

In France employers that use additive manufacturing are taking an active role in training learners. Learners have access to multiple specialist and technical trainers and good access to the latest technology. In some instances, employers have equipped their training schools with the same machines which are used in WorldSkills competitions.

The need to incorporate additive manufacturing into a range of sectors is likely to increase and the UK is currently aligned with TVET provision in other countries in not having a dedicated pathway for additive manufacturing, with skills providers focusing on how it can be incorporated in a wide range of occupations and employment settings. However, as many young people are exposed to 3D printing early in their education there should be more opportunities to progress this learning throughout their school education to help build up UK strength in this rapidly growing sector. Young people also need to be introduced to a top-down design approach – learning to design from physical objects rather than drawings.

Digital

Key insights

- Hackathons are a great way to replicate the success of the world's best in Cyber Security and hone young people's technical and problem-solving skills.
- Ireland has developed strong industry links to advance its digital construction education and training.
- Student-led projects, as used in Finland, can help improve vital employability skills for Web Technologies, including critical thinking and collaboration.
- Students in 3D Digital Game Art need to be able to work at pace and have a strong toolbox of skills for an industry which is internationally competitive.

Cyber Security

Over the last year, the UK's cyber security sector demonstrated significant resilience and growth, with a 13% increase in sector revenue, and 2,700 new jobs created[14]. The UK's reputation as a leader in cyber security is supported by high quality TVET options, with 12 of 31 Higher Technical Qualifications in the Digital field including a cyber security specialisation.

Other leading countries are now integrating cyber security more comprehensively within STEM programmes at an early stage of education and training to boost foundational skills. This approach is being pursued in Korea, providing a strong pipeline to Cyber Security Centres of Excellence where industry specialists are being offered fast tracked training programmes to move into teaching[15]. Korea is also excelling in providing hands on learning opportunities with industry leaders such as Samsung and using employer-designed cyber security Hackathons. These test young people's ability to adapt to unexpected challenges in a real-world industry scenario whilst honing their technical skills.

Korea is excelling in providing hands on learning opportunities with industry leaders and using employer-designed cyber security Hackathons

The UK is already beginning to learn from the Korean example. In March this year, WorldSkills UK hosted a three-day Cyber Hackathon, with over 100 young people participating in capture the flag activities requiring innovative thinking and collaboration within teams.

Digital Construction

WorldSkills UK's expert has led the development of courses and qualifications in digital construction adopted by further and higher education institutions in England, Scotland and Wales. These have a very strong practical emphasis and have integrated WorldSkills occupational standards into day-to-day teaching, requiring young people to be proficient in using REVIT and BIM, and develop project management, teamwork and communication skills.

To progress the teaching, learning and assessment further in this area the UK should have a greater join up between industry and skills providers as there is in Ireland, where Industry Advisory Boards have a strong hand in programme content and provide internships and work placements to those studying architectural technology courses. Irish institutions have also invested in state-of-the-art facilities focused on equipping young people to work with the latest tools and methodologies. Irish courses also repeatedly test young people's ability to deliver projects at the pace required in industry, giving their students a leading edge in developing business-ready skills.

14 Cyber security sectoral analysis (2024), DSIT
15 Plan for Vocational High School Support and Employment Promotion (2020), Korean Government

Web technologies

The UK has a diverse mix of TVET for Web Technologies, which all share a focus on providing practical skills in web development, including front-end and back-end technologies, design implementation and adherence to industry standards. Strengths of the UK's system include a strong infrastructure in skills providers and an emphasis on hands on learning. The UK can improve web technologies teaching, learning and assessment further by using more student-led projects which improve critical thinking, independent reasoning, collaboration, and analytical skills essential for success in professional environments.

The UK could also learn from Finland, which launched a National Implementation Plan to ensure the full exploitation of emerging digital technologies through TVET, including the funding of development projects to improve the quality of teaching[16]. Although requirements for vocational teaching qualifications are fairly restrictive in Finland, strong collaborative agreements allow for professional development placements for teachers in industry and are considered an important part of their continuing education[17]. The Finnish system also places a lot of emphasis on employability skills such as problem solving alongside technical training. This includes via student-led projects co-designed by young people, employers and TVET institutions that mimic real world scenarios.

With industry placing a greater emphasis on cloud computing, DevOps practices, and cyber security skills in the face of rising threats, it's important that more educators can stay abreast of these changes. Group, student-led projects also help young people to become more resilient, adaptable, and collaborative with fast-paced technological changes.

3D Digital Game Art

The UK is recognised as one of the best places in the world to make video games. Between 2010 and 2022, output from the UK video games sector expanded £400m to £2.2bn (+459%), with growth accelerating since 2017[18]. The TVET system continues to support competitiveness of this industry. Organisations like the NextGen Skills Academy have played an important role in developing apprenticeship standards and qualifications in partnership with industry leaders. Leading colleges have also embedded WorldSkills UK's competition-based training model into curriculum design to raise standards and consolidate strengths in Concept Art, 3D Modelling, Unwrapping and Texturing.

16 Vocational education and training policy briefs – Finland (2024), Cedefop
17 Teachers and Trainers in a changing world – Finland (2022), Cedefop
18 DCMS Economic Estimates: Gross Value Added for DCMS Sectors and Subsectors (2024), DCMS

To improve UK training in video game art further we can learn lessons from Singapore, which places an emphasis on pace within its training. In real-world commercial environments, speed can give firms a competitive edge, with games development companies needing to meet tight deadlines and competing against one another to bring games to market.

To meet this skills need it will be important for UK educators to have access to current industry experience to stay up to date with the latest technologies. It's also important to focus on a toolbox of relevant skills that students can use in any scenario rather than teaching students to develop specific assets. Doing the basics well is very important to students' ability to work at pace. From there students can work on more complex projects with less teacher support.

Clean Energy and Health and Social Care

Key insights

- Advanced simulation and virtual reality software can play a key role in TVET programmes for Renewable Energy and hold opportunities to attract and inspire young people to explore these careers.
- The UAE is using virtual reality (VR) and augmented reality (AR) technologies at part of continuous medical education, driving high standards in Health & Social Care.

Renewable Energy

The Prime Minister has committed to making Britain a "clean energy superpower"[19]. Realising this ambition will require an increased number of skilled professionals capable of designing, manufacturing, deploying and maintaining renewable energy infrastructure.

In order to develop skills for the renewable energy industry many countries, including Switzerland, have decided to embed new technologies and requirements into existing pathways. For example, skills for the solar industry are embedded into electrical installation training, skills for heat pumps are part of training to be a plumber.

In terms of training, the UK can learn lessons from China, whose training in this area makes use of advanced simulation software to train young people for careers in Renewable Energy, allowing for students to learn, fail, and innovate in a risk-free environment. The Chinese renewable energy industry has also been heavily involved in co-designing training, as well as providing workshops and seminars to keep students and educators informed of the latest trends. Training for renewable energy also sits within China's ambition to have the most globally competitive TVET system by 2035[20], with a comprehensive

19 Press release (2024), HM Government
20 White Paper on China's Development of Vocational Education (2022), People's Republic of China Ministry of Education

package to beef up vocational schools' ability to deliver for high-growth industries including renewable energy.

Innovative providers throughout the UK are beginning to use simulation and virtual reality (VR) software in their training approaches. The use of VR technology is also an effective way to attract and inspire more young people to consider a career in Renewable Energy.

International leaders in this field, such as China and India, also maintain very strong links with industry to ensure learners have access to the latest technologies and educators can stay up to date with industry developments.

Health and Social Care

The UK Government has recently announced a ten-year plan to build a health service fit for the future. This focuses on moving more care from hospitals to communities, making better use of technology, and sickness prevention. These priorities will need to be reflected in skills development within the health and social care workforce.

To achieve this, lessons can be drawn from the training approaches of other nations. For example, United Arab Emirates mandates continuous medical education supported by state-of-the-art facilities and technologies such as virtual and augmented reality to ensure professionals stay up to date with the latest care techniques.

Taiwanese health and social care training is aligned to WorldSkills competition standards, with insights integrated into the curriculum to ensure they stay at the forefront of the sector's needs

Training for health and social care in Taiwan provides further insights for the UK. Students there are trained to approve care holistically, addressing the physical, emotional and social needs of individuals. Students are also exposed to technology as part of their training such as the latest advancements in e-health, telemedicine and electronic health records management. Taiwanese health and social care training is also aligning to WorldSkills competition standards, with insights integrated into the curriculum to ensure they stay at the forefront of the sector's needs.

WorldSkills UK can help raise standards in UK TVET

Conclusion

Back-to-back top ten finishes at WorldSkills competitions show that the UK's skills systems can be competitive with the best in the world

WorldSkills UK has published this report, in partnership with Pearson, to share the insights we have gathered from two years of involvement in international skills competitions and collaborations across the WorldSkills International movement, to help inform UK skills policy and practice.

Back-to-back top ten finishes at WorldSkills competitions show that the UK's skills systems are amongst the best in the world. This should be a clear signal to international firms that they can invest in the UK with confidence, while reassuring UK employers that our technical education systems can provide the pipeline of high-quality skilled professionals needed for growth.

As policy-makers and education leaders reflect on Team UK's success there are three trends in international skills development that should be topics for debate across the UK.

Firstly, WorldSkills events remind us how demanding technical skills disciplines can be across a wide range of sectors: competitors are judged to the finest of margins to demonstrate their skills mastery, encouraging students to achieve ever higher standards. In the same way, skills competitions could provide a more rigorous approach to assessing skills levels in the UK, as an alternative to the more

theoretical ways of assessing technical skills currently used. Additional advantages of using competitions include testing practical and project-based models of assessment which mirror the application of skills that employers need. They also require key employability skills such as critical thinking, problem solving, collaboration, and resilience, which are vital for success in the workplace.

Secondly, our international case studies clearly show that different models of employer and education links in other countries are working successfully to support training in line with industry needs and standards. Dual professionalism in many countries means employees simultaneously having one foot in industry and the other in education. The advantages of this approach are that industry can be confident that training is in line with their needs and technological developments, while educators have less need to compete with industry for full-time teaching staff. Learning from the models of dual professionalism in the Netherlands, Switzerland, Austria and Brazil could be game-changing for the UK skills sector and WorldSkills UK is keen to work with partners to pilot this approach.

Thirdly, while the pursuit of excellence is the driving philosophy of the WorldSkills international movement, excellence in skills is not yet part of the DNA of the UK's skills system. The insights in this report can help us learn how other countries develop world-class skills. If we combine these learnings with a competition-based approach to training technical skills we can help young people from all backgrounds realise their full potential and aspire to excellence in their skill, also helping to supply the high-quality skills that employers need.

Next steps – routes for education and industry to access world-class skills development

Through over 70 years of experience of benchmarking against international standards, WorldSkills UK is uniquely placed to draw insights from practices across the world's leading and emerging economies which gives us a deep, diverse understanding of various educational systems, approaches, and strategies, which we integrate into our programmes.

This wealth of knowledge serves as our foundation for fostering excellence across WorldSkills UK's programmes to implement strategies, curricula, and training methodologies that align with global benchmarks, so that all learners are not only prepared to meet, but exceed standards of excellence, setting them up for success in a competitive global economy.

Educators

Competition-based learning

WorldSkills UK offers a pathway to excellence at all levels through competition-based learning to drive skills development in students and apprentices. It's an evidenced-based approach in driving standards and promoting excellence in teaching, learning and assessment.

Benchmarking resources

Benchmarking resources help to embed world-class skills in classrooms and workshops across a range of industries and skills. Developed by education and industry experts, these resources are designed for educators to use with their learners in preparation for future competition entry and/or progression into the world of work.

Benchmarking Events

Benchmarking events are virtual, interactive, one-day industry-themed events throughout the academic year, where learners can push their skills, while enjoying the process of creating something extraordinary in their field. Events include the Cyber Hackathon, Game Jams, and Designathons.

Local skills competition endorsement framework

Using the WorldSkills UK proven training methodology and international insights we are supporting the endorsement and validation of local competition activity (college and inter-college competitions), to help raise standards in technical and vocational education and widen access to excellence. The Local Skills Competition Endorsement framework offers guidance and procedures on how to create and deliver quality assured competition activity.

National competitions

WorldSkills UK's national competition cycle runs from February to November with three stages for students and apprentices to benchmark their skills against national and international standards, culminating in our week-long National Finals in November each year. Successful competitors will also have the chance to be selected for our international training programme in preparation for competing in WorldSkills Shanghai 2026 or WorldSkills Japan 2028.

Find And Enter A National Skills Competition - WorldSkills UK

Workforce development - Centre of Excellence

Drawing on international best practices and groundbreaking research into UK and global TVET systems, the WorldSkills UK Centre of Excellence is an award-winning workforce development programme providing world-class teacher training, interactive networks for innovation, communities of practice in digital, advanced manufacturing and thought leadership. Institutions across the UK can enrol join as a member our Centre of Excellence programme which provides access to world-class teacher training development, plus our Network for Innovation and sector-based Communities of Practice which foster the sharing of best practice across national and international skills providers and industry.

Centre of Excellence - WorldSkills UK

Industry

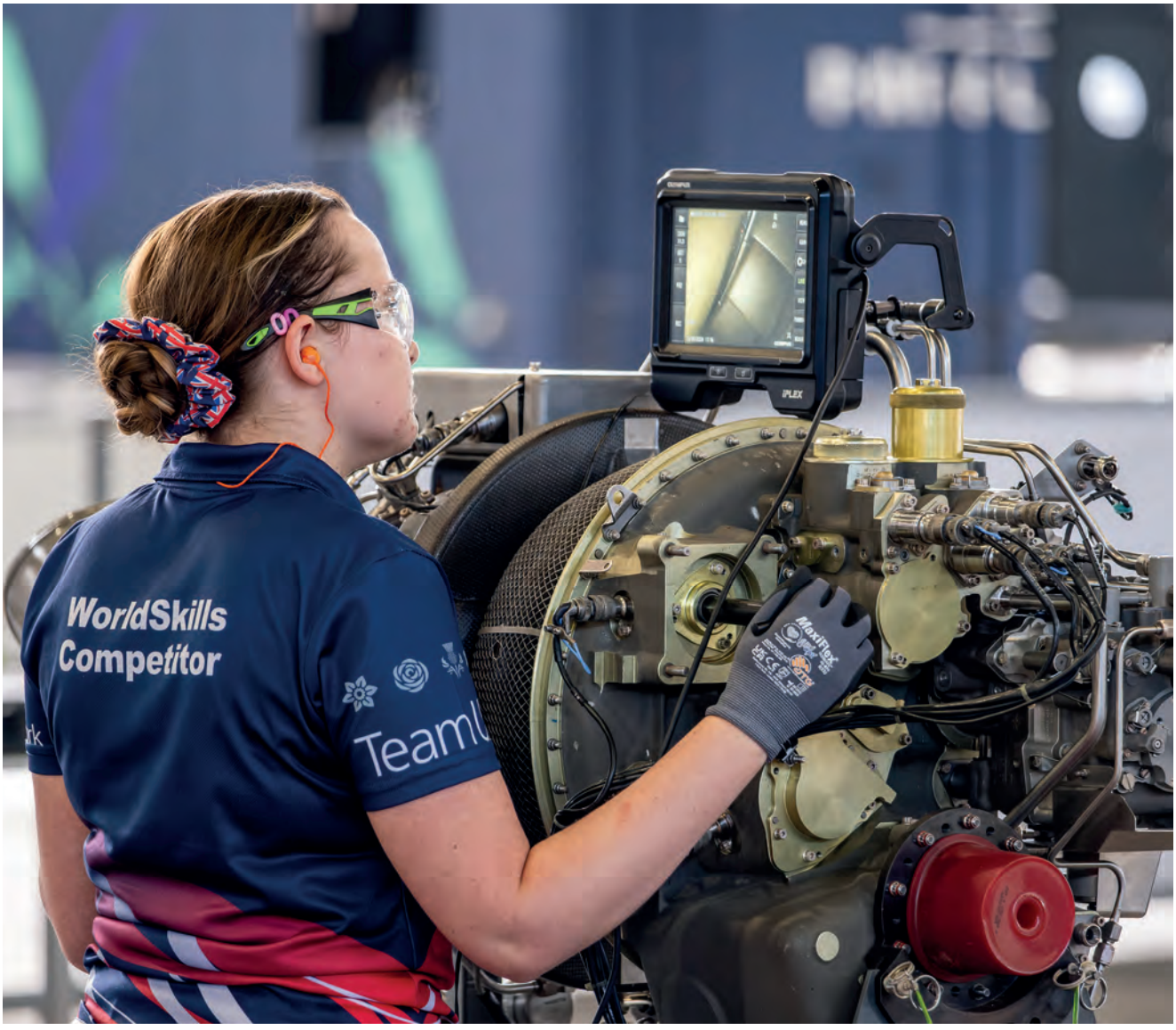
Pathway to excellence – national competitions

Industry partners can benefit from involvement in WorldSkills UK national competition cycle, through entering apprentices into the competition cycle, consultation on test projects, involvement in setting up new skills competitions, judging competitions and sharing industry-standard equipment that can help give competitors world-class training opportunities.

Centre of Excellence and Learning Lab

Industry partners can help promote world-class skills development by partnering with us on our Centre of Excellence and co-create benchmarking events and resources in the WorldSkills UK Learning Lab facility.

Partner With Us - Business Partnerships - WorldSkills UK



Annex:

List of organisations that attended the Learnings from Lyon Roundtable, September 2024

- Association of Employment & Learning Providers
- Amazon
- Association of Colleges
- City of Liverpool College
- Department for Economy Northern Ireland
- Department for Education
- Gatsby Charitable Foundation
- Institute for Apprenticeships & Technical Education
- Inspiring Skills Excellence in Wales
- North Regional College
- North Warwickshire & South Leicestershire College
- Pearson plc
- SKOPE
- The Association of the British Pharmaceutical Industry
- University College Birmingham
- University of Adelaide
- University Vocational Awards Council
- Welsh Government

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