# WorldSkills UK Centre of Excellence
## Innovation Project
## Maker to Mentor

### Tameside College
### Delivered in partnership with WorldSkills UK and NCFE

IN PARTNERSHIP WITH NCFE

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# Centre of Excellence

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Tameside College

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## Executive summary

**The challenge**
Employers across Greater Manchester's advanced manufacturing sector continue to report recruitment difficulties in robotics, automation, digital production and engineering maintenance. The Greater Manchester Local Skills Improvement Plan (LSIP) identifies advanced manufacturing, advanced materials and digital technologies as priority growth sectors that need increased investment in workforce capability.

Two workforce gaps sit behind those shortages. FE educators need structured routes to stay current with fast-moving industrial technology, while experienced engineers are increasingly expected to train apprentices and mentor colleagues without a formal teaching qualification. Conventional CPD addresses these gaps separately, if at all.

**The innovation**
The project was not a CPD delivery programme in the conventional sense. It set out to design, test and evaluate a dual professionalism model in which teaching staff and industry mentors build each other's expertise, rather than receiving separate, parallel training. Two strands ran together:

- Technical dual professionalism: educators and learners building industrial currency through employer-led CPD in Industry 4.0 technologies (robotics, automation, CAD, additive manufacturing).
- Pedagogical dual professionalism: industry professionals building teaching capability through the Level 3 Award in Education and Training (AET), enabling them to train apprentices, mentor colleagues and contribute to FE delivery.

What distinguished this from existing practice was the shared delivery model itself. Employers were embedded as co-designers of curriculum, assessment and Higher Technical Qualification (HTQ) projects rather than occasional advisers; educators, learners and employer mentors learned together in the same sessions rather than through separate CPD tracks; and immersive VR and 360-degree resources were built into curriculum delivery rather than used only for demonstration. Section 3 sets out this comparison in more detail.

**What the evidence shows**
Around 80 learners, educators and employer representatives took part, supported by more than 10 engineering and manufacturing employers. Delivery included 20 employer-led additive manufacturing CPD sessions (40 hours in total), further automation and mechatronics CPD, and a 12-week AET cohort for five industry professionals.

Baseline confidence across the seven assessed skill areas averaged 2.95 out of 5, weakest in quality assurance and ISO procedures (2.38) and in using digital manufacturing tools such as CNC and robotics (2.52). By end-point, average confidence had risen to 4.18 out of 5, an average uplift of 1.23 points, and 20 of the 21 participants (95%) showed a measurable overall improvement. Every one of the seven skill areas improved, and the two weakest areas at baseline recorded the largest gains (up 66% and 64%), indicating that employer-led CPD reached the areas of greatest identified need rather than reinforcing existing strengths. The largest individual gains were concentrated among participants who started with the lowest confidence.

Industry professionals completing the AET reported increased confidence in lesson planning, assessment, learner engagement, inclusive teaching and reflective practice, building training capability inside employer organisations rather than leaving it with the College.

**Why it matters for the FE sector**
The project demonstrates a practical model for closing two gaps at once, educator technical currency and industry mentor teaching capability, using the same collaborative delivery structure rather than two separate CPD programmes. Replication does not depend on involving the same organisations, but on the same core functions being represented and a small number of components being kept intact: employers positioned as co-designers, technical and pedagogical CPD delivered together, a recognised teaching qualification route for industry mentors, and baseline-to-end-point evaluation of participant confidence.

This has direct relevance for other FE providers working with growth-sector employers, and the principles are transferable beyond advanced manufacturing to any technical sector where educators need industrial currency and industry professionals are already mentoring informally.

**Legacy for Tameside College**
The project leaves Tameside College with stronger employer partnerships, enhanced HTQ provision, embedded WorldSkills UK excellence methodologies, and a tested framework for developing the technical workforce. Continuing at the same scale will not be financially viable without dedicated external funding; instead, the model's principles are being embedded within mainstream curriculum and employer engagement activity, with the AET retained as a progression route into the Level 5 Learning and Skills Teacher Apprenticeship and oversight held through the College's established quality assurance processes.

## 1. Project context

**1.1 Regional and sector context**
The project was developed in response to regional and national workforce challenges affecting advanced manufacturing. As Industry 4.0 technologies become embedded within manufacturing, employers need higher-level technical skills in automation, robotics, additive manufacturing, digital manufacturing and advanced engineering. FE providers must ensure educators remain technically current, while experienced engineers are increasingly expected to train apprentices and mentor colleagues without formal teaching qualifications.

These challenges are reflected in the Greater Manchester Local Skills Improvement Plan (LSIP), which identifies advanced manufacturing, advanced materials and digital technologies as priority growth sectors. The LSIP highlights persistent recruitment difficulties, growing demand for Level 3 to 5 technical skills, shortages in robotics, automation, CNC, CAD/CAM, additive manufacturing and engineering maintenance, and a transition towards Industry 4.0 and net zero manufacturing.

Project evaluation reinforced these regional priorities. Baseline Skills Scan data identified moderate to low confidence across key advanced manufacturing competencies, particularly quality assurance and ISO procedures, digital manufacturing tools such as CNC and robotics, and operating advanced manufacturing equipment. Workplace CPD Record Booklets showed that although industry professionals had strong occupational expertise, many lacked confidence in lesson planning, assessment, learner engagement and inclusive teaching.

Together, this evidence showed that closing regional skills shortages needs more than technical upskilling alone. It also depends on strengthening dual professionalism: developing technically current educators alongside industry professionals who have the pedagogical skills to train and develop the future workforce. The project was designed around two complementary strands: technical dual professionalism, delivered through employer-led CPD in advanced manufacturing technologies, and pedagogical dual professionalism, delivered through the Level 3 AET, enabling experienced engineers to become effective workplace trainers, mentors and vocational educators.

Greater Manchester supports approximately 96,000 manufacturing jobs and benefits from nationally significant innovation assets, including Atom Valley, the Oxford Road Corridor, the Salford Innovation Corridor and Manchester Science Park. As these innovation ecosystems expand, demand for technically skilled educators and industry professionals capable of developing future talent will keep growing.

**1.2 Strategic relevance for Tameside College**
Tameside College occupies a strategically important position within Greater Manchester's advanced manufacturing economy. Continued investment through the Mayoral Development Zone and wider Industry 4.0 initiatives is increasing demand for higher-level technical skills, stronger employer engagement and responsive technical education.

The project strengthened the College's role within this regional skills ecosystem by embedding employers as active partners in curriculum design, professional development and workforce planning, rather than as occasional consultees. Employers contributed directly to curriculum development, technical CPD, authentic learning activities and industry-informed HTQ provision.

A key innovation was developing industry professionals through the Level 3 AET, increasing employers' capacity to coach apprentices, mentor staff and deliver effective workplace learning. This strengthened workforce capability within participating organisations and improved collaboration between education and industry.

Together, these strands built a sustainable model that improves curriculum relevance, strengthens educator industrial currency, develops employer capability and supports regional economic growth. It positions Tameside College as a catalyst for employer-led technical education and provides a scalable framework that can be replicated across other technical sectors.

**1.3 Alignment with the Local Skills Improvement Plan**
The project's response to identified regional skills challenges is set out below, alongside the evidence base for each response. This directly addresses the LSIP's identified priorities rather than describing alignment in general terms.

| LSIP challenge | The project's response | Evidence |
|---|---|---|
| Shortages in robotics, automation and CNC/CAD skills across the FE and employer workforce | Employer-led technical CPD in robotics, automation, CAD and digital manufacturing, co-designed with employers | Skills Scan data showing baseline-to-end-point improvement in these specific competency areas (Section 5.5) |
| Experienced engineers expected to train and mentor without formal teaching skills | Level 3 AET delivered to industry professionals, enabling them to train apprentices and mentor colleagues | Workplace CPD Record Booklet evidence of increased confidence in lesson planning, assessment and inclusive teaching (Section 5.7) |
| Need for stronger, sustained employer-education collaboration in growth sectors | Employers repositioned as curriculum co-designers rather than advisers, contributing to assessment and HTQ project design | Partnership model and governance evidence (Section 2); multiple employer-led HTQ projects and employer-written challenge briefs, including Siemens-led engineering curriculum and HTQ co-design |
| Transition towards Industry 4.0 and net zero manufacturing requiring updated technical curricula | Immersive VR/360-degree learning and Industry 4.0-aligned CPD embedded throughout curriculum delivery, not used only for demonstration | Curriculum and delivery evidence (Section 4.3); learner and educator reflections (Section 6) |

## 2. Partnership model and governance

The project was delivered through a collaborative partnership bringing together FE providers, engineering employers, specialist technology providers, higher technical education partners and internal college teams. Each partner contributed complementary expertise to co-design curriculum, deliver employer-led professional development, develop immersive learning resources and evaluate outcomes.

The partnership built on long-established relationships between Tameside College and regional employers, creating the trust and shared commitment needed to move beyond traditional employer engagement. Employers became active delivery partners: validating technical content, providing specialist expertise, supporting curriculum development and creating authentic learning experiences aligned to current industrial practice, rather than acting solely as advisers.

Education partners ensured curriculum quality, progression and pedagogical excellence, while specialist technology providers delivered training using industry-standard software and equipment. Internal college teams coordinated governance, quality assurance, digital development, project management and operational delivery, keeping all activity aligned with regional skills priorities and WorldSkills UK objectives Within this partnership, Tameside College and WorldSkills UK held distinct and complementary roles. Tameside College acted as lead delivery partner, holding day-to-day responsibility for project management, employer engagement, curriculum integration, staffing and quality assurance, and reporting progress, risk and evaluation findings to WorldSkills UK throughout delivery (see Section 2.2). WorldSkills UK, as funder and national owner of the Centre of Excellence Innovation Fund, provided strategic direction and quality benchmarks, embedded its Developing Excellence Framework and competition-based learning methodologies into the project, and connected the partnership to a UK-wide network of providers for.

**2.1 Partners and their roles**

**Industry partners**
Industry partners provided technical expertise, industrial insight and authentic workplace contexts so that curriculum content reflected current engineering practice and future workforce requirements. They also supported the pedagogical development of industry professionals through mentoring, apprenticeship development and the AET.

Partners included: Amazon, Siemens, Whitecroft Lighting, Hyde Group, Fusion, Didactic and 3DGBIRE. Collectively, these organisations contributed to curriculum co-design, technical validation, employer-informed project briefs, workplace-based learning activities, workforce-readiness development, industry mentoring and technical demonstrations, and support for apprenticeship training.

**Education partners**
Education partners ensured that industrial expertise was successfully integrated into teaching, assessment and learner progression, while supporting the pedagogical development of industry professionals. Partners included Tameside College, The Manchester College, the WorldSkills UK Centre of Excellence and the Greater Manchester Institute of Technology (GMIoT). Together they supported curriculum development, educator CPD, learner engagement, technical assessment, HTQ integration, progression pathways and delivery of the AET.

**Specialist technology providers**
Specialist providers ensured participants developed practical experience using current industrial technologies and software. Partners included Autodesk, Fusion, 3DGBIRE and Didactic who delivered specialist training in additive manufacturing, CAD and digital manufacturing, automation, mechatronics, Industry 4.0 technologies and industrial software workflows.

**Internal Tameside College teams**
Successful delivery relied on strong collaboration across Engineering, Education, Digital Development, Finance, Marketing, the iHub Technical Team and A-Level Media. Their combined contribution covered project management, curriculum integration, digital learning development, communications, quality assurance, financial management, operational delivery and coordination of technical and pedagogical CPD activities.

**Lead partner responsibilities**
As lead partner, Tameside College coordinated all aspects of project delivery, governance and quality assurance, including strategic leadership, curriculum integration, employer and learner engagement, educator development, monitoring, evaluation and reporting to WorldSkills UK. The College also provided specialist workshop facilities, digital infrastructure and teaching expertise.

The Head of Engineering kept the project aligned with curriculum priorities, HTQs, employer expectations and regional skills priorities. In parallel, the Education Department delivered the Level 3 AET, enabling experienced engineers and technical specialists to develop the pedagogical knowledge needed to train apprentices, mentor colleagues and contribute confidently to FE. Together, these complementary activities strengthened both the technical and pedagogical dimensions of the project's dual professionalism model.

**Strategic partner contributions**
Siemens supported automation, mechatronics and digital manufacturing through curriculum co-design, technical validation and authentic industrial projects. Whitecroft Lighting provided workplace-informed learning experiences and manufacturing case studies. Fusion, Autodesk and 3DGBIRE delivered industry-standard additive manufacturing and CAD training. Didactic supported automation and mechatronics training through specialist equipment. The WorldSkills UK Centre of Excellence embedded the Developing Excellence Framework, benchmarking methodologies, competition-based learning and reflective practice. The High-Performance Skills Coach strengthened learner resilience, reflective practice and performance coaching, and Higher Education and GMIoT partners ensured alignment with Level 4 and 5 technical skills and progression pathways.

**2.2 Governance and leadership**
Senior Leadership Team (SLT) support was secured by demonstrating alignment with Greater Manchester LSIP priorities, technical and pedagogical dual professionalism, HTQs, employability, GMIoT priorities and regional productivity and workforce development. Regular reports monitored project progress, budget, risk, learner engagement, employer participation and technical and pedagogical outcomes.

A cross-college project board provided governance through clearly defined responsibilities, scheduled review meetings, financial monitoring, safeguarding, equality, diversity and inclusion, curriculum quality assurance and risk management. Within this structure, Tameside College held operational governance responsibility, exercised through the Senior Leadership Team and cross-college project board described above, while strategic oversight and funding accountability sat with WorldSkills UK, to whom Tameside College reported project progress, risk and evaluation findings throughout delivery.

**2.3 What enabled effective collaboration**
The partnership's effectiveness was not the result of any single activity, but of several interdependent factors. Long-established relationships between Tameside College and its employer partners were central: many organisations had already worked with the College over several years through curriculum development, apprenticeship delivery, work placements, HTQs, WorldSkills competitions and employer engagement. That established trust let partners move beyond an advisory role into genuine co-design, delivery and evaluation.

Strong strategic leadership and visible SLT commitment also mattered. Project objectives were aligned with the LSIP, HTQ development, GMIoT priorities and the College's strategic vision for employer-led technical education, securing organisational commitment, resourcing and effective governance.

A shared vision between education and industry kept all partners working towards common objectives, encouraging employers to invest time, expertise, facilities and resources throughout the project. Regular communication and collaborative planning, through scheduled project meetings, curriculum design workshops and ongoing employer engagement, created opportunities to review progress, resolve operational challenges and adapt delivery in response to feedback.

Flexibility was a critical success factor: delivery models were adapted to accommodate employer operational pressures, staff availability and production schedules without compromising learning outcomes. Hybrid delivery, employer-based workshops, online AET delivery and flexible scheduling enabled greater participation from industry professionals while maintaining programme quality.

The most distinctive feature of the project was its shared CPD model, bringing educators, learners and employers together in the same learning environment rather than delivering separate training programmes for each group. Educators strengthened their industrial currency by working directly with current technologies and manufacturing practices, while industry professionals developed teaching capability through the AET, enabling them to train apprentices, mentor colleagues and contribute more effectively to vocational education. This reciprocal model built a common professional language across education and industry and transformed relationships from transactional partnerships into genuine communities of practice.

**2.4 Minimum viable partnership model**

Evaluation suggests that successful replication does not depend on involving the same organisations, but on ensuring the same core functions are represented. The table below also sets out an indicative minimum resource commitment for each role, to help other providers assess feasibility before adopting the model.

| Essential role | Primary contribution | Indicative minimum resource commitment |
|---|---|---|
| Lead FE provider | Project leadership, governance, curriculum integration and quality assurance | 0.5 to 1 day per week throughout the project |
| Industry partners | Industrial expertise, curriculum co-design, authentic projects and technical validation | 12 to 20 hours per employer over the life of the project |
| Specialist technology provider | Industry-standard equipment, software and technical CPD | 8 to 12 delivery days across a typical annual programme |
| Professional development partner | Delivery of pedagogical CPD, including the AET, and embedding WorldSkills excellence methodologies | 36 to 48 guided delivery hours per cohort, plus assessment and learner support |
| Higher education / technical skills partner | Progression pathways and higher technical skills | 4 to 6 hours of liaison per term |
| Internal support services | Project management, communications, finance and operational support | 2 to 4 FTE days per month |

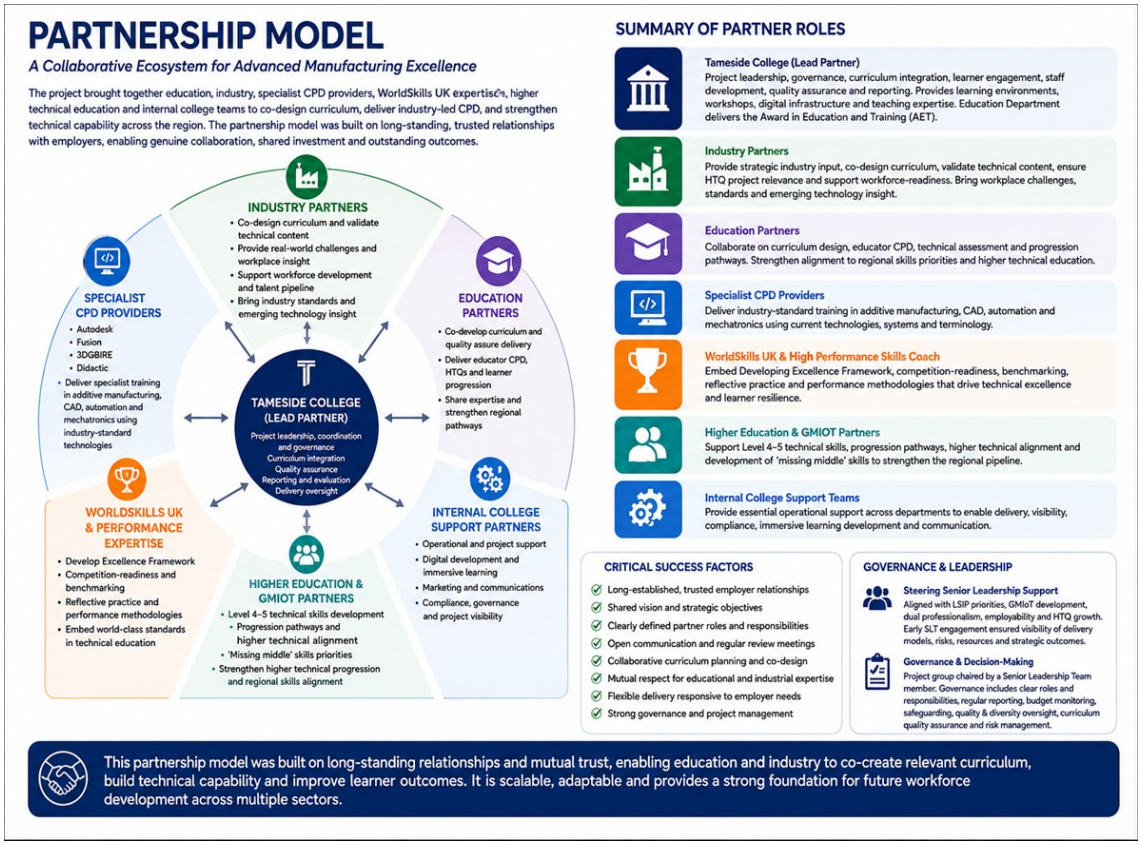
These are indicative planning assumptions for providers considering replication, not fixed staffing requirements or precise costings. A lead FE provider's time covers strategic coordination, partner meetings, delivery planning, monitoring, risk and reporting. Employer engagement hours cover initial engagement, planning meetings, curriculum or brief development, scheduling, delivery liaison, feedback and evaluation, and will vary depending on whether an employer acts as an adviser or is directly involved in delivery. The AET delivery estimate should be confirmed against the College's individual delivery model. Internal coordination covers administration, timetabling, employer communication, participant coordination, data collection, finance, marketing and quality processes.

**2.5 Added value of the partnership model**

The partnership model delivered benefits well beyond CPD delivery. Evaluation showed that collaborative working increased curriculum relevance through direct employer involvement, strengthened educators' industrial currency, developed the pedagogical capability of industry professionals, improved learner exposure to authentic manufacturing environments, increased employer ownership of technical education, supported the co-design of authentic industrial projects, strengthened regional employer networks, and created sustainable partnerships that will continue beyond the funded project.

This added value was not limited to local delivery. As a partner within the WorldSkills UK Centre of Excellence programme, Tameside College also gained access to a UK-wide network and platform for dissemination, giving other providers a route to see, adopt and adapt the model set out in Section 8, and connecting the partnership to national benchmarking and excellence methodologies that a purely local partnership could not have provided.

The project embedded collaboration throughout curriculum design, technical and pedagogical professional development, assessment and governance, rather than treating employer engagement as a discrete activity. This integrated approach is one of the project's most significant innovations, and provides a scalable model for strengthening technical education through sustained employer partnership.



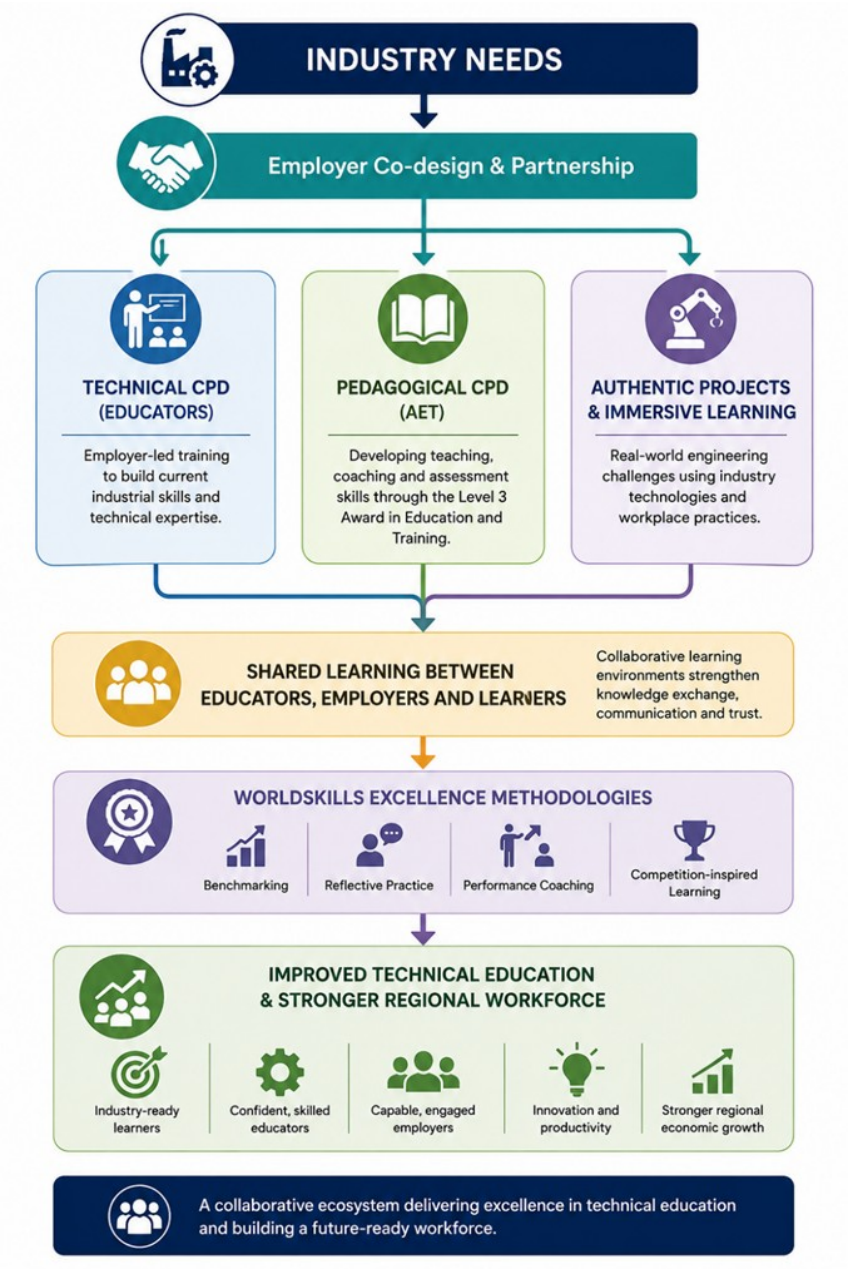

## 3. Innovation model

### 3.1 Overview of the innovation

The project developed and evaluated a model of technical education that redefined the relationship between education and industry. Employers were established as equal partners in the design, delivery and continuous improvement of technical education, rather than treated as external advisers or occasional contributors, so that industrial expertise directly informed curriculum development, professional learning, technical assessment and learner experiences throughout.

At the centre of the innovation was a collaborative ecosystem bringing together educators, learners, employers, specialist technology providers and higher education partners within a single delivery framework. Instead of separate development opportunities for different stakeholder groups, the project created shared learning environments where participants learned alongside one another through authentic engineering challenges, employer-led workshops and industry-standard technologies.

A defining feature of the model was its integration of technical and pedagogical dual professionalism: strengthening educators' industrial currency while simultaneously developing the teaching capability of experienced industry professionals. This was reinforced by the systematic integration of WorldSkills UK excellence methodologies, including reflective practice, performance coaching, benchmarking and competition-inspired approaches to learning.




**3.2 What was different from existing practice**

The Innovation Fund was not intended to support CPD delivery on its own; it asked providers to trial and evaluate a genuinely new model. The table below sets out what changed compared with typical practice, so the innovation itself, rather than the activity around it, is clear.

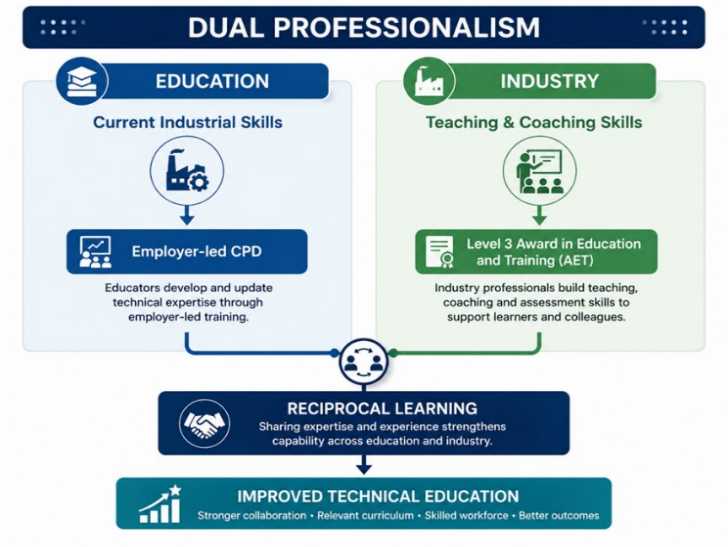
| Typical existing practice | This project's model | Why it matters |
|---|---|---|
| Employers consulted occasionally, mainly at validation panels or advisory boards | Employers embedded as co-designers of curriculum, assessment and HTQ projects throughout delivery | Curriculum stayed current with employer need rather than being validated after the fact |
| CPD delivered separately to staff, with learners and employers trained through different routes | Educators, learners and employer mentors learned together in shared sessions | Built a shared professional language and let each group learn directly from the others' expertise |

| Typical existing practice | This project's model | Why it matters |
|---|---|---|
| VR and immersive technology used mainly for demonstrations or health and safety simulations | Immersive technology (VR, 360-degree environments) embedded throughout curriculum delivery | Gave access to authentic manufacturing environments that would otherwise be inaccessible or unsafe to replicate |
| Industry professionals' mentor or train informally, without a recognised teaching qualification | Industry professionals completed the Level 3 AET as a structured, assessed strand of the project | Built a transferable, recognised pedagogical capability rather than ad hoc mentoring |

**3.3 Dual professionalism framework**

The project's principal innovation was integrating technical and pedagogical professional development within a single collaborative framework, rather than treating them as separate activities. High-quality technical education depends on educators maintaining current industrial knowledge, while industry professionals need the skills to coach, mentor and develop others effectively.

Technical dual professionalism focused on maintaining educators' industrial currency through direct engagement with employers and exposure to emerging manufacturing technologies. Pedagogical dual professionalism enabled experienced engineers to strengthen their teaching, coaching and assessment practice through structured professional development. Bringing the two strands together created reciprocal learning: educators gained a deeper understanding of current industrial practice, while employers developed greater confidence in supporting apprentices, mentoring colleagues and contributing to vocational education.



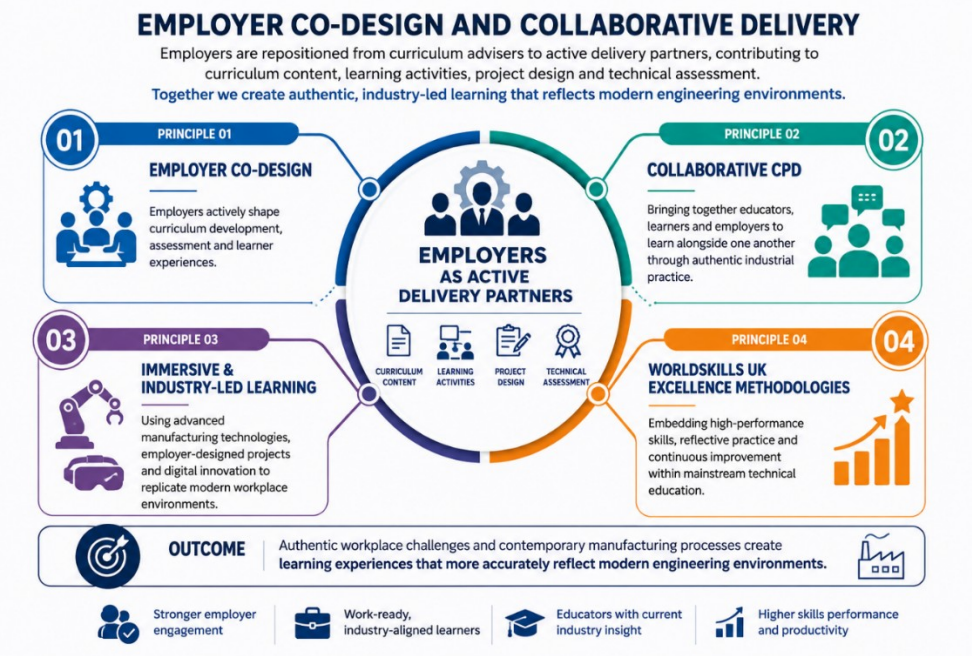

**3.4 Employer co-design and collaborative delivery**

A distinguishing feature of the model was repositioning employers from curriculum advisers to active delivery partners, contributing to curriculum content, learning activities, project design and technical assessment throughout the process. This let engineering programmes incorporate authentic workplace challenges and contemporary manufacturing processes, creating learning experiences that more accurately reflected modern engineering environments.

The project's four collaborative delivery principles were:

- Employer co-design: embedding employers as active partners in curriculum development, assessment and learner experiences.
- Collaborative CPD: bringing together educators, learners and employers to learn alongside one another through authentic industrial practice.
- Immersive and industry-led learning: using advanced manufacturing technologies, employer-designed projects and digital innovation to replicate modern workplace environments.

- WorldSkills UK excellence methodologies: embedding high-performance skills, reflective practice and continuous improvement within mainstream technical education.




### 3.5 Shared professional learning

The model deliberately removed traditional boundaries between educators, learners and employers by creating shared professional learning environments. Collaborative workshops, technical demonstrations and employer-led engineering activities let participants from different backgrounds learn alongside one another, encouraging the exchange of knowledge, experience and professional practice, and creating a shared professional language that will continue to support collaboration after the project ends.

### 3.6 Authentic learning and industry integration

Authenticity was built into the model throughout. Learning activities were designed around real engineering challenges, industry-standard technologies and workplace practices rather than simulated classroom exercises. Employer-designed projects, advanced manufacturing technologies and immersive learning environments let participants apply technical knowledge within realistic industrial contexts, strengthening learner engagement, developing practical problem-solving skills and improving participants' understanding of professional engineering standards.

### 3.7 Embedding WorldSkills UK excellence

The model was underpinned by WorldSkills UK excellence methodologies, promoting high-performance behaviours alongside technical competence. Benchmarking, reflective practice, performance coaching and competition-inspired learning were integrated throughout the project rather than delivered as standalone activities, creating a culture of continuous improvement and strengthening technical precision, resilience, communication and professional confidence.

## 4. Implementation and delivery

### 4.1 Overview

The implementation phase translated the project's strategic vision into a coordinated programme of employer-led technical education and CPD. By integrating curriculum innovation, industry collaboration, educator development, pedagogical training and immersive technologies, the project ensured learning reflected current industrial practice while strengthening workforce capability across FE and the advanced manufacturing sector.

Delivery was underpinned by the project's dual professionalism model: technical dual professionalism, enabling educators to maintain industrial currency through employer-led CPD in robotics, automation, CAD, additive

manufacturing and Industry 4.0 technologies; and pedagogical dual professionalism, enabling industry professionals to develop effective teaching practice through the Level 3 AET, equipping them to train apprentices, mentor colleagues and contribute confidently to vocational education.

Implementation was intentionally collaborative, employer-led, flexible and evidence-informed. Progress was continuously monitored through Skills Scans, Workplace CPD Record Booklets, attendance records, participant feedback and employer review meetings, allowing delivery to be refined throughout the project.

**4.2 Implementation timeline and key milestones**
Delivery followed four structured phases over a 12-month period.

| Phase | Period | Key activities |
|---|---|---|
| Planning and partnership development | Aug to Oct 2025 | Governance, employer engagement, curriculum planning |
| Curriculum design and resource development | Oct to Dec 2025 | Curriculum development, automation CPD, VR resource creation, assessment design and AET preparation |
| Programme delivery | Jan to May 2026 | Employer-led CPD, learner workshops, HTQ projects, AET delivery and immersive learning |
| Evaluation and continuous improvement | Throughout delivery | Skills Scans, participant feedback, evaluation and dissemination |

Investing roughly half of the project's effort before delivery ensured employers were embedded as genuine curriculum partners rather than external advisers. Continuous evaluation throughout implementation enabled real-time improvements, using participant feedback, reflective practice and evidence gathered through the Skills Scan process.

**4.3 Delivery activities**

**Employer-led technical CPD**
Employer-led CPD formed the technical foundation of the project, giving educators, learners and industry professionals access to contemporary manufacturing technologies and industrial expertise. Specialist training delivered by employers and technology partners covered robotics, automation, mechatronics, additive manufacturing, CAD and digital manufacturing. Unlike traditional CPD, which is usually delivered solely to teaching staff, educators, employers and learners developed their technical capability together, strengthening technical confidence and keeping teaching aligned with current Industry 4.0 practices.

The additive manufacturing strand alone delivered 20 structured CPD sessions, each two hours long (40 hours of delivery in total): four introductory sessions for learners, four introductory sessions for industry partners, four intermediate sessions for learners, four intermediate sessions for industry partners, and four sessions for teachers and GMIoT partners. This was developed with Fusion/Autodesk and complemented by further CPD and practical development in automation and mechatronics, which extended the overall offer beyond additive manufacturing alone (exact session counts for these strands are not yet quantified). 18 learners took part in Introduction to Additive Manufacturing training, and 12 learners each took part in automation and mechatronics activity.

**Employer co-design and curriculum innovation**
Employers played an active role in designing and validating curriculum content so that learning activities reflected contemporary engineering practice rather than simulated classroom exercises. Working alongside curriculum teams, industry partners co-developed HTQ projects, employer-set engineering challenges, assessment activities and immersive learning resources based on real manufacturing processes.

**Award in Education and Training (AET)**
The Level 3 AET formed the pedagogical strand of the dual professionalism model, supporting experienced engineers and technical specialists to become confident educators, trainers and workplace mentors. Delivered flexibly through online and blended learning, the programme let participants balance study alongside operational responsibilities. Five industry participants registered for the 12-week AET programme. Reflective evidence showed substantial improvements in participants' confidence in lesson planning, assessment, learner engagement, inclusive teaching, feedback and reflective practice, and strengthened employers' internal capability to train apprentices and mentor colleagues.

**Immersive learning and digital innovation**
Immersive learning technologies were used throughout the programme to replicate authentic manufacturing environments that are often inaccessible in traditional educational settings. VR, 360-degree workplace experiences and employer-designed engineering projects let participants explore industrial processes and Industry 4.0 concepts in safe, engaging and realistic learning environments, rather than being used solely as a demonstration tool.

### 4.4 Technical and pedagogical outcomes
Analysis of the Skills Scan workbooks demonstrated improvements in technical confidence. At baseline, the participants who went on to complete both assessments averaged 2.95 out of 5 across the seven assessed skill areas, with the lowest confidence in quality assurance and ISO procedures, digital manufacturing tools such as CNC and robotics, and operating advanced manufacturing equipment.

By programme completion, average confidence had risen to 4.18 out of 5, with participants (95%) showing a measurable overall improvement and two reaching maximum confidence (5 out of 5) across every skill area. The greatest improvements were in quality assurance and ISO procedures (up 66%) and digital manufacturing tools (up 64%). Full figures, including the evaluation's limitations, are set out in Section 5.

The AET programme complemented these technical gains: Workplace CPD Record Booklets evidenced increased confidence in lesson planning, assessment, learner engagement, effective feedback, reflective practice and inclusive teaching.

### 4.5 What worked well
Several factors contributed to successful implementation, at a meaningful scale:

- Employer-led CPD that strengthened educators' industrial knowledge and technical confidence (20 additive manufacturing CPD sessions delivered, 40 hours in total, plus further automation and mechatronics CPD).
- Successful delivery of the AET, developing teaching capability within industry (five industry participants registered for the 12-week programme).
- Authentic employer-designed projects that improved curriculum relevance (multiple employer-led HTQ projects and challenge briefs, including Siemens-led engineering curriculum and HTQ co-design).
- Integration of WorldSkills UK excellence methodologies into teaching and learning.
- Stronger employer understanding of FE and workforce development.
- Effective collaboration across Engineering, Education, Digital Development, Finance, Marketing, the iHub Technical Team and A-Level Media, involving approximately 30 FE staff across the wider project.

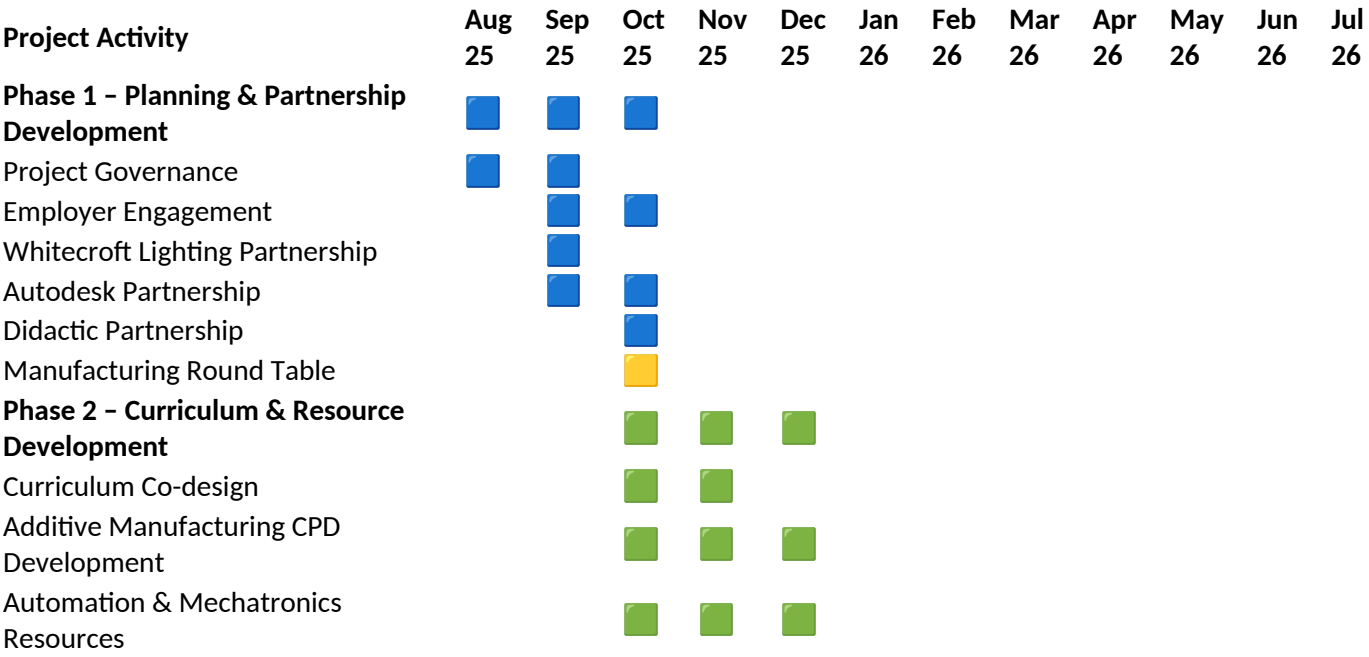
### 4.6 Challenges and adaptations
The project remained responsive to operational challenges throughout delivery. Key issues included employer availability, participant workload, curriculum development timescales, multi-partner coordination and the creation of immersive learning resources. These were mitigated through flexible scheduling, hybrid delivery, shorter CPD sessions, shared responsibilities across departments and strengthened project management, reinforcing the importance of flexible, employer-responsive delivery when running collaborative technical education initiatives.

### 4.7 Capacity, resources and operational considerations
Successful implementation required investment beyond programme delivery itself: curriculum redesign, employer engagement, specialist equipment, immersive technologies, project management, quality assurance, evaluation and pedagogical development. Maintaining momentum required ongoing communication and careful coordination to

balance educational priorities with employer operational demands, particularly for industry professionals completing the AET alongside full-time employment.

**4.8 Implementation learning**
Sustained employer collaboration delivered significantly greater impact than isolated engagement activities. Employers contributed most effectively when involved as curriculum co-designers rather than occasional advisers, and educators benefited from continuous exposure to current industrial practice. Industry professionals developed greater capacity to train and mentor through structured pedagogical development.

By integrating employer co-design, collaborative CPD, immersive learning, the AET and continuous evaluation into a single delivery model, the project strengthened both technical and pedagogical dual professionalism while building sustainable partnerships between education and industry. This provides a scalable framework for delivering employer-informed technical education that is responsive to regional workforce priorities.



## 5. Evaluation framework and evidence base

### 5.1 Evaluation approach

The project used a mixed-method evaluation framework to measure both the implementation of activities and their impact on participant confidence, technical capability, pedagogical development and employer engagement, comparing baseline and end-point Skills Scan data with qualitative evidence gathered throughout the project.

Rather than measuring participation alone, the evaluation set out to determine whether collaborative employer-led CPD strengthened technical dual professionalism, enhanced pedagogical dual professionalism, and improved collaboration between FE providers and industry. It drew on quantitative baseline and end-point Skills Scan data, Workplace CPD Record Booklets completed by AET participants, attendance and participation monitoring, CPD completion records, participant, educator and employer feedback, reflective evaluations, employer review meetings and project documentation.

### 5.2 Dataset overview

| Dataset | Evidence collected |
|---|---|
| **Skills Scan workbooks** | **Workbooks issued across the participant cohort, with the majority containing completed data** |
| **Baseline and end-point assessments** | **Baseline and end-point assessment data collected, with most participants completing both stages** |
| **Workplace CPD Record Booklets** | **Evidence from industry participants undertaking the Level 3 Award in Education and Training (AET)** |
| **Total participants engaged** | **A substantial cohort of participants engaged across project activities** |
| **Employer organisations** | **Engagement from a broad range of engineering and manufacturing employers** |
| **Attendance records** | **Records of participation in CPD sessions and workshops** |
| **Project documentation** | **Delivery records and evidence of employer engagement** |

The Skills Scan workbooks provided the principal quantitative evidence for measuring improvements in participant confidence across seven skill areas: applying health and safety regulations; operating advanced manufacturing equipment; following quality assurance and ISO procedures; using digital manufacturing tools such as CNC and robotics; problem-solving in manufacturing processes; collaborating with colleagues and industry partners; and sharing technical knowledge with others.

The Workplace CPD Record Booklets complemented these findings by providing evidence of the pedagogical development of industry professionals undertaking the AET qualification.

### 5.3 Evaluation limitations

This evaluation should be read alongside its limitations. While the evidence base is consistent and encouraging, several constraints should be recognised:

- **Sample size:** A proportion of the overall participant cohort completed both baseline and end-point assessments in full. This limits the extent to which findings can be generalised across all participants engaged in the project.
- **Self-assessment measures:** Skills Scan confidence ratings are self-reported rather than independently assessed measures of competence. They therefore indicate participants' perceived confidence rather than objectively demonstrated skill.
- **Short evaluation period:** The assessment window covers a single academic year, which limits the conclusions that can be drawn about the longer-term durability of the improvements observed.

- **No long-term tracking:** The evaluation does not currently follow participants beyond the project period. It therefore cannot determine whether improvements in confidence and professional practice are sustained over time.
- **Volunteer and self-selection bias:** Participants opted into the project, meaning that the findings may not be representative of staff or employers who did not choose to participate.
- **Attribution:** Outcomes cannot be attributed solely to project activities, as participants may also have been influenced by other professional development, workplace experiences and organisational factors occurring during the same period.

These limitations do not undermine the evidence presented; rather, they define the boundaries within which the findings should be interpreted. Findings are therefore presented as indicative of positive change associated with participation in the project, rather than as definitive evidence of causation.

**5.4 Baseline position**

| Baseline finding | Result |
|---|---|
| Completion of baseline and end-point assessments | The majority of participants with completed Skills Scan records provided sufficient baseline and end-point data to support comparative analysis |
| Lowest recorded confidence | Quality assurance and ISO procedures |
| Lower-confidence areas | Quality assurance and ISO procedures; digital manufacturing tools, including CNC and robotics; and operating advanced manufacturing equipment |
| Highest baseline confidence | Collaborating with colleagues and industry partners |

The baseline evidence indicated that participants entering with lower levels of confidence often had more limited previous exposure to advanced manufacturing technologies. This provided a clear rationale for employer-led technical CPD and opportunities to develop practical knowledge and confidence in industry-relevant environments.

Workplace CPD Record Booklets identified a complementary baseline position among industry professionals undertaking the AET qualification. Although participants demonstrated strong occupational expertise in areas such as automation, mechatronics and advanced manufacturing, many initially reported lower confidence in aspects of teaching and learning, including lesson planning, assessment, learner engagement, classroom management and inclusive practice.

This suggests that strong technical and occupational expertise does not automatically translate into confidence in teaching, training and supporting the development of others. The AET provision therefore addressed an identifiable professional development need alongside the project's technical CPD activity.

**5.5 End-of-project position**

| Outcome | Evidence |
|---|---|
| Overall confidence improvement | Almost all participants with comparable baseline and end-point data demonstrated an overall improvement in confidence |
| End-point confidence | Participants generally reported high levels of confidence across the assessed competency areas by the end of the project |
| Overall change | Comparative assessment data showed a clear positive uplift in confidence across the competency areas |
| Highest levels of confidence | Some participants reached the highest confidence level across all assessed areas |

| Outcome | Evidence |
|---|---|
| Greatest improvements | Particularly strong improvements were evident in quality assurance and ISO procedures and the use of digital manufacturing tools |

The largest improvements were generally observed among participants who entered the programme with lower baseline confidence. These participants demonstrated substantial gains across the assessed skill areas and, by the end of the project, reported confidence levels that were much closer to those of participants who had entered with stronger baseline confidence.

While the overall pattern was strongly positive, individual variation was present within the data, including isolated instances where confidence did not increase. This variation is reported transparently and reinforces the importance of interpreting the findings within the evaluation limitations outlined in Section 5.3.

Qualitative evidence also indicated substantial improvements in pedagogical confidence among AET participants. Participants commonly reported increased confidence in planning and delivering learning, adapting teaching to individual learner needs, providing effective feedback, applying reflective practice, and supporting apprentices and colleagues within workplace learning environments.

Taken together, the quantitative and qualitative evidence indicates a positive shift in both technical and pedagogical confidence over the course of the project. The findings suggest that the combination of employer-led technical CPD and structured teaching development provided participants with opportunities to strengthen their professional practice, while recognising that the available evidence demonstrates association with project participation rather than direct causation.

**5.6 Skills Scan results by skill area**

| Skill area | Baseline (avg/5) | End-point (avg/5) | % improvement |
|---|---|---|---|
| Quality assurance and ISO procedures | 2.38 | 3.95 | +66% |
| Digital manufacturing tools (CNC, robotics) | 2.52 | 4.14 | +64% |
| Sharing technical knowledge with others | 2.86 | 4.19 | +47% |
| Operating advanced manufacturing equipment | 2.67 | 3.90 | +46% |
| Problem-solving in manufacturing processes | 3.29 | 4.43 | +35% |
| Applying health and safety regulations | 3.38 | 4.24 | +25% |
| Collaborating with colleagues and industry partners | 3.52 | 4.38 | +24% |

Every one of the seven assessed skill areas improved. The two areas with the lowest starting confidence, quality assurance/ISO procedures and digital manufacturing tools, also saw the largest percentage gains, suggesting the project's employer-led CPD was reaching the areas of greatest identified need rather than reinforcing existing strengths.

**5.7 Quantitative evidence**

Approximately 80 participants engaged across the programme.

| Participant group | Approximate number | Percentage* |
|---|---|---|
| FE staff | 30 | 38% |

| Participant group | Approximate number | Percentage* |
|---|---|---|
| Industry representatives | 20 | 25% |
| Learners and apprentices | 30 | 37% |

* Percentages are based on approximately 80 project participants.

**5.8 Qualitative evidence**

Qualitative evaluation complemented the quantitative findings by providing a deeper understanding of participants' professional development. Participant reflections consistently identified increased technical confidence, improved workplace readiness, greater understanding of Industry 4.0 technologies, stronger employer-education relationships, improved confidence using advanced manufacturing technologies, and greater appreciation of industrial standards and quality systems.

Workplace CPD Record Booklets also demonstrated the impact of the AET. Participants from the automation, mechatronics and advanced manufacturing sectors completed structured reflective reviews during the programme. Although they entered with strong occupational expertise, many initially reported lower confidence in lesson planning, assessment, classroom management, learner engagement and inclusive teaching. By programme completion, participants consistently described increased confidence in planning and delivering learning, adapting teaching to individual learner needs, providing effective feedback, applying reflective practice, mentoring apprentices and colleagues, and contributing to vocational education within FE and industry.

These findings show that the project strengthened pedagogical dual professionalism, enabling industry specialists to combine current technical expertise with effective educational practice. Employer feedback similarly highlighted improved understanding of FE delivery, increased willingness to contribute to curriculum development, and stronger long-term partnerships with the College.

**5.9 Evidence of impact beyond confidence**

**Educators**

- Changes made to curriculum: Siemens worked directly with curriculum teams to co-design engineering units, technical projects and assessment activities based on current automation and mechatronics practice, shifting assessment towards practical application rather than theoretical recall.
- New teaching approaches adopted: employer-informed HTQ projects and Industry 4.0 technologies were incorporated into delivery, translating industrial engagement directly into curriculum practice.
- Industry-informed modules introduced: engineering units contextualised around automation and mechatronics, developed jointly with Siemens.
- Teaching resources created: employer-designed learning materials, authentic engineering challenges and immersive VR/360-degree manufacturing resources, providing a curriculum legacy that continues beyond the funded project.

**Employers**

- New mentoring activity: AET graduates are better equipped to train apprentices and mentor colleagues, building training capability inside employer organisations rather than the benefit staying with the College.
- Internal training delivered: AET participants developed the ability to plan learning, assess learners, give effective feedback, adapt teaching to individual needs and apply reflective practice, skills directly transferable to in-house workforce development.
- Apprentices supported: AET graduates are positioned to support apprentices and colleagues within their own organisations as an ongoing activity, not a one-off project output.
- Staff developed through the AET: five industry participants registered for the 12-week programme.

**Learners**

- Project outputs: Skills Scan reflections recorded specific technical outputs rather than general confidence gains, for example fault-finding skills and competition participation, and improved ISO and health and safety procedural understanding.
- Work-based learning experiences: employer-informed HTQ projects introduced authentic manufacturing challenges based on real industrial problems and workflows, so learners applied technical knowledge in realistic workplace contexts rather than through conventional classroom assignments alone. Participants entering with the lowest baseline confidence showed the largest gains after employer-led CPD; for example, two students each moved from a baseline total of 9 out of 35 across the seven skill areas to 32 to 33 out of 35 by end-point.
- Progression outcomes: not yet confirmed, for example whether any learners progressed to an apprenticeship, HTQ or further study as a direct result of the project.
- Employer engagement opportunities: 18 learners took part in Introduction to Additive Manufacturing training (developed with Fusion/Autodesk, including careers input and a competition activity), and 12 learners each took part in automation and mechatronics activity.

**5.10 Key performance indicators and success measures**

| KPI | Target | Status | Headline evidence |
|---|---|---|---|
| Employer engagement | Employers actively involved in curriculum design and CPD | Achieved | 10+ employer organisations engaged in co-design and delivery |
| Educator technical development | Increase educator industrial confidence | Achieved | Skills Scan confidence gains across all assessed competencies (Section 5.6) |
| Industry educator development | Improve pedagogical confidence through the AET | Achieved | Reflective evidence of increased confidence in teaching, assessment and learner engagement |
| Learner technical capability | Improve learner confidence across advanced manufacturing competencies | Achieved | Skills Scan mean uplift of 1.23 points (2.95 to 4.18 out of 5) across the cohort of 21; a learner-only breakdown would need a role field added to the Skills Scan template for future cohorts |
| Collaborative CPD | Shared learning involving educators, employers and learners | Achieved | Approximately 80 participants across combined CPD sessions |
| Curriculum innovation | Embed employer-led projects | Achieved | Multiple employer-led HTQ projects and challenge briefs, including Siemens-led engineering and HTQ curriculum co-design |
| WorldSkills UK methodologies | Embed excellence framework | Achieved | Developing Excellence Framework and performance coaching embedded across delivery |

| KPI | Target | Status | Headline evidence |
|---|---|---|---|
| Partnership sustainability | Develop long-term employer relationships | Achieved | 10+ employers retained through to end of project; see Section 8 for continuation commitments |
| CPD delivery volume | Deliver structured employer-led CPD across all workstream areas | Achieved | 20 additive manufacturing CPD sessions delivered (40 hours), plus further automation and mechatronics CPD; approximately 30 FE staff involved across seven departments |

**5.11 Overall evaluation conclusions**

The evaluation shows that the project translated collaborative employer engagement into measurable improvements in both technical and pedagogical capability, within the limitations set out in Section 5.3. Comparison of baseline and end-point Skills Scans provides quantitative evidence of increased confidence across all seven advanced manufacturing competency areas, with the greatest improvements among participants who started with the lowest confidence.

Workplace CPD Record Booklets complement this by showing that industry professionals completing the AET developed greater confidence in lesson planning, learner engagement, assessment, reflective practice and inclusive teaching. Together, this evidence shows the project strengthened both technical dual professionalisms, by enhancing educators' industrial capability, and pedagogical dual professionalism, by equipping industry specialists with the teaching skills to support apprentices, mentor colleagues and contribute to vocational education.

Beyond individual skills development, the project strengthened collaboration between FE providers and employers, increased educator exposure to current industrial practice, enhanced curriculum relevance and embedded WorldSkills UK excellence methodologies into mainstream technical education.

## 6. Outcomes and impact

**6.1 Overview**

The project has generated benefits that extend beyond improvements in individual technical skills. By embedding employers as active partners in curriculum development and professional learning, it has strengthened technical education, enhanced workforce capability and built a sustainable model of collaboration between education and industry, influencing learners, educators, employers, curriculum design, organisational practice and regional workforce development.




### 6.2 Impact on learners

The project enhanced learners' readiness for employment by giving direct access to employer expertise, advanced manufacturing technologies and authentic engineering projects. Learning activities reflected contemporary industrial practice, letting learners apply technical knowledge within realistic workplace contexts rather than simulated classroom exercises.

Participants reported increased confidence in technical problem solving, greater awareness of Industry 4.0 technologies and a stronger understanding of employer expectations. Exposure to industry-standard equipment and employer-designed projects also improved motivation and demonstrated clearer progression routes into advanced manufacturing careers. Beyond technical competence, learners developed wider employability skills, including communication, collaboration, adaptability and professional confidence, strengthening their readiness for apprenticeships, HTQs and skilled employment.

"Taking part in the WorldSkills UK Centre of Excellence Innovation Project has given me a much clearer understanding of what it is like to work in the engineering industry. Working alongside employers and using industry-standard equipment made learning much more realistic and helped me understand how the skills I develop in college are applied in the workplace. I feel much more confident in my technical abilities, better prepared for future employment and excited about pursuing a career in advanced manufacturing."

**— Ireen Kapoor, Tameside College student**

### 6.3 Impact on educators

Educators benefited from sustained engagement with employers and specialist technology providers, strengthening their industrial currency and confidence in delivering advanced manufacturing content. Rather than relying on occasional industrial updating, the project established continuous professional learning through collaborative CPD, so educators could bring current technologies, manufacturing processes and employer expectations directly into

curriculum delivery. This has strengthened curriculum relevance, improved the authenticity of learning activities and enhanced educators' ability to prepare learners for modern engineering workplaces.

"Working alongside industry professionals has given me valuable insight into how advanced manufacturing continues to evolve and has strengthened my confidence in delivering contemporary engineering education. The opportunity to collaborate on curriculum design, learn new technologies and embed WorldSkills UK excellence methodologies has enhanced both my professional practice and the learning experience we provide for our students. Most importantly, it has helped ensure that our curriculum reflects the skills, behaviours and standards that employers are looking for in the next generation of engineers."

**— Charlotte Thornton, Tameside College**

**6.4 Impact on employers**

Employer partners experienced benefits well beyond curriculum consultation. Participation let employers influence future workforce development while strengthening their own organisational capability: through the AET, experienced engineers developed greater confidence in coaching, mentoring and supporting apprentices and colleagues in the workplace. The project also strengthened employers' understanding of FE, building closer relationships with curriculum teams and increasing opportunities for future collaboration, recruitment and workforce planning. Employers became long-term strategic partners rather than occasional advisers.

"This project has shown that employers can play a much greater role in technical education than simply recruiting learners at the end of their studies. By working alongside Tameside College, we have been able to help shape curriculum, develop future engineers and strengthen our own workforce through improved coaching and mentoring skills. The partnership has created lasting value for both organisations, and we look forward to continuing to support curriculum development and employer-led learning in the future."

**— Warren Young, Whitecroft Lighting**

**6.5 Organisational impact**

The project has strengthened Tameside College's capacity to deliver employer-informed technical education. Key organisational impacts include stronger strategic partnerships with engineering employers, enhanced curriculum co-design processes, increased educator industrial capability, expansion of employer-led HTQ activity, integration of WorldSkills UK excellence methodologies into mainstream delivery, and improved cross-college collaboration between curriculum, quality, digital, marketing and project support teams.

**6.6 Equity, diversity and inclusion**

Equity, diversity and inclusion (EDI) was considered throughout the design and delivery of the project, particularly around accessibility, flexibility of participation, and ensuring that participants with different levels of prior experience were able to benefit. The project brought together learners, FE educators and industry professionals from a range of organisations and career stages, creating a collaborative environment where participants with different professional backgrounds and technical experience learned alongside one another.

**Inclusive recruitment and participation**

Recruitment sought to provide opportunities across the three principal participant groups: learners and apprentices, FE staff, and industry representatives, engaging approximately 30 FE staff, 20 industry representatives and 30 learners and apprentices. Participation was not restricted to individuals who already had high levels of advanced manufacturing expertise: baseline Skills Scan evidence showed considerable variation in starting confidence, with some participants averaging below 2 out of 5, and the collaborative CPD model let less experienced participants work alongside educators, industry specialists and technical providers regardless of starting point. The evaluation indicates that participants entering with lower confidence were able to make substantial progress (Section 5.5), suggesting the programme did not disproportionately benefit only those who already had advanced technical capability.

**Scheduling and delivery format**
Accessibility mattered particularly for industry professionals and FE staff, whose participation was affected by operational workloads, teaching commitments and employer release arrangements. Delivery was adapted through flexible scheduling around employer and curriculum commitments, shorter technical CPD workshops, remote delivery of the AET, hybrid learning opportunities, and practical workshops designed to accommodate different participant groups. Flexible online AET delivery was particularly important for industry professionals, letting them develop teaching and mentoring capability alongside full-time employment without extended workplace release. Inclusive practice was also embedded within the AET itself: industry professionals developed their understanding of adapting teaching to individual learner needs, inclusive teaching approaches, assessment and effective learner engagement, extending the project's EDI impact into participants' own organisations.

The project also used a mix of practical, collaborative, digital and immersive learning rather than a single mode of participation, and assessment drew on Skills Scans, Workplace CPD Record Booklets, participant reflection, practical activity and feedback rather than relying solely on traditional written assessment. Immersive VR/360-degree resources also have potential to improve accessibility by letting participants experience manufacturing environments that may otherwise be difficult to access physically; this should be developed further as part of a more explicit inclusive-learning strategy in future iterations.

**Participant profile**
The project engaged a mixed professional cohort: approximately 38% FE staff, 25% industry representatives and 37% learners and apprentices. Demographic information relating to protected characteristics (such as gender, disability, ethnicity or age) was not collected within the evaluation dataset at a level that supports reliable aggregate reporting. This means the project cannot currently evidence whether participation was representative of the wider learner, FE or advanced manufacturing workforce across these characteristics. This is a genuine limitation of the evaluation, not a gap in this report, and future projects should build in equality monitoring from the point of recruitment, where appropriate and compliant with data protection requirements, so participation, retention, completion and outcomes can be analysed by demographic group.

**Barriers to engagement**
The principal barriers identified during delivery related to time and organisational capacity rather than participants' technical ability. Employer operational pressures affected release for training, while FE workforce pressures and teaching commitments affected educator availability; participation across some CPD strands was initially lower than anticipated as a result. Smaller organisations may be disproportionately affected by this kind of barrier, since releasing one employee places relatively greater pressure on their operational capacity; the project responded through flexible scheduling, shorter workshops, remote AET delivery and hybrid approaches, though future programmes should consider employer release capacity at the recruitment and planning stage. A further EDI challenge is representation: without more detailed demographic monitoring, it is not possible to determine whether groups traditionally underrepresented in engineering and advanced manufacturing were proportionately represented in project activities. Future delivery should consider both access to participation and representation within participation.

**Recommendations for future improvement**
- Collect appropriate equality monitoring data at enrolment and report this in aggregate.
- Establish an EDI baseline against the demographic profile of the relevant learner, FE and advanced manufacturing workforce.
- Monitor recruitment, attendance, retention, completion and outcomes by participant group and, where appropriate, protected characteristic.
- Undertake targeted engagement where particular groups are identified as underrepresented.
- Retain flexible, hybrid and remote delivery options where these reduce barriers to participation.
- Give employers delivery schedules significantly in advance to support staff-release planning.
- Consider modular or shorter CPD options for SMEs and organisations with limited staff-release capacity.
- Continue to embed inclusive teaching practice within the AET and wider CPD offer.
- Design digital, VR and immersive resources with accessibility in mind.
- Gather participant feedback specifically on accessibility, inclusion and barriers to engagement as part of future evaluation.

Overall, the project shows that flexible delivery, collaborative learning and multiple modes of participation can support equitable access to advanced technical and pedagogical development. The key learning point is that inclusive delivery must be paired with robust demographic monitoring if future projects are to demonstrate not just that opportunities were accessible, but that they reached and supported groups underrepresented in technical education and advanced manufacturing.

### 6.7 Regional impact

The project contributes directly to Greater Manchester's ambitions to develop a highly skilled workforce capable of supporting growth in advanced manufacturing and Industry 4.0. By strengthening collaboration between education and industry, it has improved alignment between technical education and employer requirements, supporting regional priorities identified in the LSIP, HTQs and GMIoT. The table below links specific project outcomes to the regional skills challenges they respond to, addressing Paul's request to make this alignment explicit rather than general.

| LSIP-identified regional challenge | Project outcome | Evidence |
|---|---|---|
| Recruitment difficulties in robotics, automation and digital production | Educator and learner confidence gains concentrated in exactly these competency areas | Greatest Skills Scan improvements recorded in robotics, automation and digital manufacturing (Section 5.5) |
| Shortage of technically current FE educators | Sustained employer-led CPD embedding current industrial practice into teaching | 10+ employer organisations engaged in ongoing technical CPD delivery |
| Experienced engineers untrained in workplace teaching and mentoring | AET completion among industry professionals | Reflective evidence of increased teaching and mentoring confidence (Section 5.8); five industry participants registered for the 12-week AET |
| Weak alignment between technical education provision and employer need | Employer co-design of curriculum, assessment and HTQ projects | Partnership model evidence (Section 2); multiple employer-led HTQ projects and challenge briefs, including Siemens-led engineering/HTQ curriculum work |

The model also demonstrates how collaborative technical education can support increased productivity, innovation and workforce resilience across the wider engineering sector.

### 6.8 Legacy and long-term impact

Perhaps the most significant outcome of the project is the establishment of a sustainable model for employer-led technical education. Rather than creating a series of standalone professional development activities, the project embedded new ways of working that will continue to influence curriculum design, educator development and employer engagement beyond the funding period. Section 8 sets out what will specifically be sustained and how.

## 7. Lessons learned

### 7.1 Do

- Invest heavily in the planning phase before delivery begins. Roughly half of total project effort went into planning and partnership development, and this was what let employers act as genuine curriculum co-designers rather than late-stage advisers.

- Build on existing employer relationships rather than starting cold. The strength of the partnership model rested on trust built over previous years of engagement through apprenticeships, work placements and WorldSkills competitions.
- Run technical and pedagogical development together, in the same sessions, rather than as parallel tracks. This is what created the shared professional language that underpinned the model's success.
- Secure visible senior leadership sponsorship early, and tie project objectives explicitly to the LSIP and institutional strategy, to protect resourcing and governance.
- Build in flexible delivery options (hybrid, employer-based, online AET) from the start, rather than adding them in response to problems.

**7.2 Avoid**

- Avoid treating employer involvement as a one-off validation step. The model's value came specifically from sustained, active co-design, not a single review meeting.
- Avoid relying solely on self-assessed confidence data as the only measure of impact. Section 5.9 shows this is a live gap in the current evidence base, not just a reporting risk.
- Avoid underestimating the coordination load of a multi-partner, multi-department project. Delivery drew on Engineering, Education, Digital Development, Finance, Marketing and technical teams simultaneously, and this needs to be resourced explicitly rather than absorbed informally.
- Avoid scheduling AET delivery without accounting for employer release time; industry professionals were balancing the qualification alongside full-time roles throughout.

**7.3 Consider**

- Consider building an independent or externally verified competence assessment alongside self-assessed Skills Scans, to strengthen the evidence base for any future iteration.
- Consider a longer evaluation window with a follow-up point after the funded project ends, to test whether confidence gains and practice changes are sustained.
- Consider setting a minimum resource commitment expectation for each partner role at the outset (see Section 2.4), so prospective partners can assess feasibility before committing.
- Consider building equality monitoring into recruitment from the outset. Delivery itself was designed flexibly and inclusively, but protected-characteristic data was not collected at a level that supports aggregate reporting, so the project cannot evidence whether underrepresented groups were proportionately reached (see Section 6.6).

## 8. Sustainability, scaling and replication

### 8.1 What will be sustained

Sustainability and legacy are referenced throughout this report; this section sets out, specifically, what will continue after WorldSkills UK funding ends. The sustainability of the partnership model is supported by continued commitment from all participating employers, who have indicated their intention to remain engaged with Tameside College beyond the funded period, maintaining relationships built through curriculum co-design, technical development, employer engagement and workforce development activity.

It will not be financially viable for the College to continue the project at the same scale without dedicated external funding. Instead, the model's core principles will be embedded within ongoing curriculum and employer engagement activity, and employer-led CPD will continue to be developed wherever resources, employer capacity and curriculum priorities allow. The AET will remain available as a sustainable progression route for industry professionals, with onward progression to the Level 5 Learning and Skills Teacher Apprenticeship, creating a structured pathway from initial pedagogical development into professional teaching practice, and giving employers a way to keep building their own in-house training and mentoring capability. As the College seeks to diversify and replicate the model across other curriculum and technical areas, governance oversight will sit with the Senior Leadership Team, monitored through the College's established quality assurance processes rather than a separate project-specific structure. This means the project's long-term sustainability does not depend on reproducing the original funded programme at the same scale; its legacy is carried through continued employer partnerships, curriculum co-design, targeted technical CPD, the established AET-to-Level-5 pathway, and normal College quality and governance processes.

| Essential role | Primary contribution | Sustainability / legacy |
|---|---|---|
| Lead FE provider | Leadership, curriculum integration, quality assurance and employer engagement | Embedded within mainstream College curriculum and employer-engagement activity |
| Industry partners | Technical expertise, curriculum co-design, authentic projects and validation | All participating employers have indicated continued commitment beyond the funded project |
| Specialist technology / CPD provider | Industry-standard technology and technical CPD | CPD opportunities maintained wherever resources, employer capacity and curriculum priorities allow |
| Professional development partner | Pedagogical development and teaching qualifications | AET remains available, with progression to the Level 5 Learning and Skills Teacher Apprenticeship |
| Higher technical skills partners | Higher-level technical development and progression | Existing progression partnerships and pathways continue to support replication |
| Internal College services | Operational, curriculum, quality and employer-engagement support | Incorporated within established College processes rather than separate funded-project infrastructure |
| Governance | Strategic oversight, accountability and continuous improvement | SLT oversight through established College quality assurance processes as the model diversifies and is replicated |

### 8.2 Core components and flexible elements

Successful replication depends on keeping certain components intact while allowing others to flex to local context.

| Must be kept | Can flex |
|---|---|
| Employers positioned as co-designers, not just advisers | Which specific employers or sector partners are involved |
| Technical and pedagogical CPD delivered together, not in parallel silos | The specific technical content or software used |
| A recognised teaching qualification route for industry mentors (such as the AET) | The delivery mode (online, blended, in-person) |
| Baseline and end-point evaluation of participant confidence | The specific evaluation tool used, provided it captures change over time |
| Senior leadership sponsorship tied to strategic priorities | The specific strategic framework it is tied to (for example a different region's LSIP) |

### 8.3 Conditions required for success

- An existing base of employer relationships to build on, or realistic time built in to establish them.
- Senior leadership sponsorship and a clear link to institutional and regional strategic priorities.
- Capacity across multiple departments (curriculum, quality, digital, finance, marketing), coordinated by a named project lead.
- Sector readiness: employers willing and able to release staff time for co-design and mentoring, not just financial contribution.

### 8.4 Barriers to scaling and how to address them

- Employer capacity: smaller employers may struggle to release staff time for co-design or AET study. Mitigation: build flexible, bite-sized engagement options and recognise smaller contributions as valid partnership roles.
- Coordination overhead: multi-partner delivery is resource-intensive to coordinate. Mitigation: name a single project lead role with protected time, as in Section 2.4.
- Evidence and evaluation capacity: smaller providers may lack the infrastructure to run baseline/end-point evaluation. Mitigation: share the Skills Scan tool and methodology as part of the replication guide (Section 8.6).
- Sector transferability: the model was developed in advanced manufacturing, where employer engagement structures are relatively mature. Providers in sectors with less established employer engagement may need a longer lead-in phase.

### 8.5 Adaptability to other sectors, regions and provider types

The model's core principles, employer co-design, collaborative CPD, immersive and authentic learning, and a structured teaching qualification for industry mentors, are not specific to advanced manufacturing. They are transferable to any technical sector where educators need industrial currency and industry professionals are already informally mentoring or training. This includes other Industry 4.0-adjacent sectors, digital and construction, and, with adaptation, service sectors where employer secondment or co-delivery is feasible.

### 8.6 How to adopt this model: a summary implementation guide

For a provider considering replication, the essential steps are:

- 1. Map existing employer relationships and identify a small group willing to move from advisory to co-design roles.
- 2. Secure senior leadership sponsorship by linking the project explicitly to an institutional or regional strategic priority (such as your local LSIP).
- 3. Design technical CPD and a pedagogical qualification route (such as the AET) as a single, co-delivered programme rather than separate tracks.
- 4. Build in baseline and end-point evaluation from day one, using a simple, consistent confidence-based tool across all participants.
- 5. Name a project lead with protected coordination time and a cross-department steering group.

- 6. Plan for flexible delivery (hybrid, employer-site, shorter sessions) to protect employer participation

## 9. Recommendations

**9.1 For colleges and FE providers**
Develop dual professionalism through reciprocal educator and employer CPD, rather than running technical updating for staff and industry mentoring separately. The evidence in Section 5 shows the greatest gains came from bringing both groups into the same learning environment, not from parallel provision.

Position employers as co-designers from the planning phase, not as a validation step late in curriculum development. Section 3.2 sets out why this distinction is the core of the innovation, not a delivery detail.

**9.2 For employers**
Invest in mentor and trainer development through recognised qualifications, such as the Level 3 AET, rather than relying on informal, unaccredited mentoring. This report's evidence (Section 5.8) shows a structured qualification route measurably increased industry professionals' confidence in teaching, assessment and inclusive practice, skills that transfer directly into apprentice and colleague development back in the workplace.

**9.3 For policymakers and funders**
Support longer-term partnership funding that enables sustained collaboration, rather than one-off engagement. The conditions for success identified in Section 8.3, particularly existing employer relationships and senior leadership sponsorship, take time to build and are put at risk by short, one-off funding cycles. Multi-year funding models would let providers embed the evaluation rigour (Section 5.3) and long-term tracking that this evaluation was not resourced to include.

## 10. Overall conclusion

This project has demonstrated that meaningful collaboration between education and industry can transform the delivery of technical education. By repositioning employers as genuine partners in curriculum design, professional development and learner delivery, rather than occasional advisers, the project created a model that is responsive to rapidly evolving industrial practices while strengthening workforce capability across the FE sector.

The project delivered lasting benefits for learners, educators, employers and Tameside College. Learners gained access to authentic industrial experiences that enhanced their technical competence, professional behaviours and readiness for employment. Educators strengthened their industrial currency through sustained engagement with employers, while industry professionals developed the confidence and capability to train, mentor and support the next generation of engineers. Collectively, these outcomes strengthened curriculum relevance, deepened employer engagement and reinforced a shared commitment to developing a highly skilled workforce.

Beyond its immediate achievements, the project established a sustainable framework for employer-led technical education that integrates curriculum co-design, collaborative professional development, immersive learning and the WorldSkills UK excellence framework within a single, scalable model. Its strength lies not only in the activities delivered, but in the enduring partnerships, shared expertise and culture of continuous improvement it has created.

As Greater Manchester continues to invest in advanced manufacturing, digital technologies and higher technical skills, this model offers a practical and transferable approach for aligning education with industry need. Its principles can be adapted across a wide range of technical disciplines, supporting workforce development, improving productivity and contributing to regional and national economic growth.

Most importantly, this project set out to answer a specific innovation question: could a genuinely shared model of technical and pedagogical development, rather than parallel CPD tracks, close both the educator currency gap and the industry mentoring gap at once. The evidence in this report, and its limitations, indicate that it can, and Sections 7 to 9 set out what should be carried forward, changed, and adopted elsewhere as a result.

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