# Technicians in Advanced Manufacturing in the UK

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- Focus: the skills and training of the technicians who fill middle-skills job roles in the aerospace, automotive, cell therapy/regenerative medicine, chemicals, composites, industrial biotechnology, nuclear, and space industries

- Reports: Available at: https://papers.ssrn.com/sol3/cf_dev/AbsByAuth.cfm?per_id=763360

## Finding 1: Widespread shortages of skilled technicians

| **Sector** | **Kind of technicians it is hard to recruit** |
|---|---|
| Aerospace, composites, space | Manufacturing technician |
| Aerospace, automotive | Composites technician (laminator) |
| Chemicals, industrial biotechnology | Control and instrumentation technician |
| MROs | Aircraft mechanics, licensed aircraft engineer |
| Cell therapy, industrial biotechnology | Manufacturing technician |

Recruitment especially hard to emerging industries, which (i) are expanding and (ii) lack a pool of established technicians

## Finding 2: Succession planning

More established industries face an emergent succession planning problem

## Finding 3: Shortcomings of using graduates to fill technician roles

Graduates are over-qualified but under-skilled, lacking the practical skills needed to apply their knowledge in the workplace

Graduates often become dissatisfied by the mundane work/low wages ➔ quickly leave (high labour turnover)

Finding 4: Increased reliance on apprenticeship training

Apprenticeship training involves:

*A structured programme of on-the-job training in practical skills, coupled with significant amounts of off-the-job technical education.

*Training/education broad enough to enable trainees to enter a technician occupation in any one of a variety of different employers

* At least two years long.

*Formally certificated, so apprentices who complete the programme will gain a recognised qualification.

## Rationale for/benefits of apprenticeship training

*Generates a supply of skilled technicians in the face of shortages

*Produces workers who are (i) able to apply their knowledge in workplace and who (ii) have realistic expectations about their job

*Enables employers to shape apprentices' standards (e.g., concerning how work must be done) and values (e.g., loyalty)

* Provides means of succession planning.

## Impediments to apprenticeships

*Colleges reluctant to offer the off-the-job technical education that employers want their apprentices to have (e.g. higher-level technical qualifications in electronics, for the space industry, modules in composites engineering).

*Colleges often also fail to offer high-quality, up-to-date practical training in the skills needed for work in composites, aerospace, and industrial biotechnology

*These problems reflect the 'tyranny of small numbers': the total number of trainees is insufficient to make it worthwhile for the relevant colleges to offer the relevant courses.

Solution: Find ways to aggregate demand for training and reduce risks faced by potential training providers:

*Develop small number of ‘centres of excellence’

*Offer training via distance learning, supplemented by periodic residential courses, to extend reach beyond local area

*Offer modules both for apprenticeship and CPD

*Reduce initial expenditure and risk by utilising existing facilities that also generate other sources of income

*Example: the UK Catapult Centres.

## Example: Apprenticeship for Manufacturing Technicians in Cell Therapy

- As CT firms move to full-scale manufacturing, will make increasing use of specialist manufacturing technicians (for cell cultivation).

- CT manufacturing roles are *technician* roles (mundane, highly routinised)

- Over-qualified graduates lack practical skills and become easily dissatisfied.

- Majority of the CT employers suggested that best approach to filling manufacturing technician positions would be to train apprentices

*Gatsby Foundation provided funding for consultants to work with employers to develop an apprenticeship and identify training providers.

* Institutional home of the team managing the apprenticeship will be the Cell and Gene Therapy Catapult Centre.

*Around 20 apprentices started training in September 2018