Workforce skills at all levels boost innovation and productivity

Skills in the workforce are crucial for firms’ ability to put innovative ideas into practice and increase productivity. Focus has traditionally been on high-level skills, but intermediate-skilled technicians and wider workforce skills are also essential.

About the research

Building and developing skills is a key part of the government’s Industrial Strategy, and widely recognised as a crucial component of firms’ ability to absorb and use ideas and technologies from elsewhere – also called a firm’s ‘absorptive capacity’ (AC).

Even if firms just wish to imitate the results of innovation carried out by other firms, they need a workforce with the relevant skills and knowledge for research, development and innovation, and the ability to turn externally-sourced innovations into improved productivity. The productivity effect from AC potentially also goes beyond individual firms, as the combined skills and AC of firms in different industries and countries can affect innovation and productivity performance across a sector or country.

In previous research there has been a tendency to only look at the highest-skilled workers in the workplace when exploring links between skills and AC, and assume that only these workers are responsible for knowledge absorption and innovation taking place. Far less attention has been paid to the rest of the workforce, such as intermediate-skilled workers (for example, technicians and apprentice-trained craft workers) or workers with uncertified skills (from informal on-the-job training and work experience).

Using a dataset covering manufacturing industries in eight countries the ESRC Centre for Research on Learning and Life Chances has carried out an in-depth analysis of the links between skills, AC, innovation and productivity performance.

Policy implications

- The Apprenticeship Levy should be used to encourage employers to provide more apprenticeships for technicians and other personnel with upper intermediate skill levels within science, engineering and technology (SET).

- Young people who drop mathematics study at age 16 are effectively excluding themselves from SET-related study and training in later life. Incentives and suitable courses in schools and colleges should be provided to encourage more young people to continue studying mathematics past age 16, thus keeping the option open to undertake SET courses at first-degree level and above.

- Too much policy discussion is focused primarily on improving the quality of new entrants to the workforce. Policymakers should offer more support for short further education courses to increase the skills of adult workers already in employment.
Key findings

- There is a positive link between high-skilled workers and turning external knowledge into innovative output, but this link also extends to intermediate-skilled workers (for instance, the support of technicians in new product design and development).

- The ability to feed innovative output into productivity depends on a firm’s full range of skill levels – not just skills associated with formal qualifications, but also uncertified skills.

- When innovation pushes the technological limits, new opportunities for productivity improvements also trickle down to the less innovative ‘laggard’ firms. Country/industry sectors far from the technological frontier typically benefit most from the scope for knowledge transfers from technological leaders.

- Even when country/industry sectors are relatively close to the technological cutting edge, productivity growth benefits not just from high-level skills, but also from being complemented by upper intermediate skilled workers who can help adopt best practices, new business models and investment in other intangible assets.

- Producers of goods and services depend on the skills of the whole workforce to transform and apply acquired knowledge effectively. For producers of innovative outputs (such as patents) high-level and upper intermediate skills are more important than lower levels of skill.

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BRIEF DESCRIPTION

The ESRC Centre for Research on Learning and Life Chances explored how separate contributions of skills, R&D intensity and other relevant variables affect AC, using an industry-level dataset which covers manufacturing sectors in seven Western European countries (including the UK) and the US between 1995-2007 to explore the links between skills, AC, innovation and productivity performance.

Geoff Mason, Ana Rincon-Aznar and Francesco Venturini: Which skills contribute most to absorptive capacity, innovation, and productivity performance? Evidence from the US and Western Europe (LLAKES Research Paper 60)
Web: www.llakes.ac.uk/research-papers

FURTHER INFORMATION

Contact: Geoff Mason, Visiting Professor at LLAKES
Email: g.mason@ucl.ac.uk

The Centre for Research on Learning and Life Chances (LLAKES) researches the connections between learning and the promotion of economic competitiveness and social cohesion. Since 2008, the LLAKES Centre has been funded by the ESRC and hosted by the UCL Institute of Education.
Web: www.llakes.ac.uk

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Web: www.esrc.ac.uk
Email: comms@esrc.ac.uk

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