



STEM EMPLOYERS' VIEWS ON SCIENCE SKILLS FOR THE WORKPLACE

Results from research into the views of STEM employers on practical skills of school-leavers, November 2011

Summary

In November 2011, 93 STEM employers were surveyed on the skills and knowledge of new employees and whether science A levels are adequately preparing school-leavers for science roles in the workplace. Results indicate the vital importance of practical skills to STEM industry but suggest there has been a general decline in the necessary practical skills of school-leavers over the past five years. These results were explored further in February 2012 with a seminar attended by 22 employer representatives. They expressed confusion over the current range of qualifications held by school-leavers, and suggested that closer links between schools and STEM industry could be very beneficial.

- All STEM employers value practical skills. They feel the most valuable skill that should be developed through A levels is that of applying practical skills to new situations.
- Over 70% of STEM employers surveyed are recruiting school-leavers to positions requiring practical skills, with almost half using a practical test at interview and 95% providing training in practical skills to new recruits.
- A significant proportion of employers surveyed felt there had been a general decline in practical skills over the past five years, and this decline was identified as one of the major threats to finding high quality recruits in the future.
- Employers believe links between schools and industry should be strengthened to equip school-leavers with the practical skills they will need to succeed within a STEM company.

Key Findings

All employers feel that practical skills are important to their organisation and employers see a number of practical skills as critical to the success of new recruits.

- *Practical skills are essential to almost all STEM employers, with 98% of those surveyed relying on staff with scientific skills who can apply them confidently in a business context.*
- *Employers defined practical skills in many ways but most focused on those which involve manual dexterity. Some focused on sector specific skills such as titration and gravimetric analysis, whereas others included generic skills such as accuracy and problem-solving.*
- *Employers said practical skills are essential to the success of new recruits. Skills of particular relevance include: using correct units of measurement; carrying out standard procedures; analysing and interpreting data; and taking and recording observations and measurements with accuracy and precision.*

STEM employers are recruiting significant numbers of school-leavers to positions requiring practical skills, but note a general decline in these skills recently and have significant concerns about the possible impact.

- *Over two-thirds of survey respondents said they had recruited school-leavers into science staff roles that require scientific skills and knowledge, with 31% recruiting individuals with GCSEs as their highest qualification.*

- 41% of survey respondents reported a decline over the last five years in the practical skills of those entering their organisations; many now fill previously non-graduate positions with graduates.
- 95% of survey respondents said that they have to provide training in practical skills to new recruits so that they can perform necessary tasks.
- STEM employers identified one of their greatest concerns over recruiting science staff in the future as the availability of applicants with practical skills.

STEM employers are not able to rely on A levels as indicators of what candidates can do, and suggest that stronger links between schools and industry could better equip school-leavers for success in the STEM workplace.

- The majority of employers reported using interviews, application forms and qualifications to indicate the practical skill of applicants. However, a surprising proportion (46%) are also using practical tests as part of their interviewing process.
- Seminar participants reported that A level grades gave disappointingly little reliable information about the relative capabilities of job candidates. Only 25% of survey respondents felt employing an A level student would bring guarantees over their ability to apply knowledge in a practical situation.
- Employers said they would like to see a focus on a range of practical skills at A level including: proficiency in problem-solving in practical situations; experience of applying practical skills to real life problems; and exposure to equipment and techniques that students will meet in employment.
- Seminar participants felt that employers had lost contact with schools and that teachers often lacked relevant industry experience. Participants suggested that work placements for trainee teachers and school students could improve the relevance of practical work in schools.
- Employers at the seminar also recognised their own responsibility to make workplaces more accessible to schools, and to educate parents and learners about the career possibilities opened up by STEM A levels.

About the study

Gatsby is a foundation set up by David Sainsbury to realise his charitable objectives. Gatsby has been supporting Science, Technology, Engineering and Mathematics (STEM) education in the UK for more than 25 years. In 2011, Gatsby began work to build an accurate picture of the health of practical work in secondary school science in order to understand how best to support it in the future.

Between November 2011 and March 2012, an online survey was circulated to STEM employers through business databases, sector skills councils, learned societies, STEM education networks and members of relevant trade associations. There were 96 valid responses from 93 different STEM employers including companies from the pharmaceutical, health, construction, energy, food, ICT and agriculture sectors. The survey was designed to establish if practical work in schools, particularly in science A level qualifications, provides students with the necessary practical skills they need to pursue a career in the STEM sector. The results were probed in more depth in February 2012 at a seminar organised in association with Edexcel and the National STEM Centre, at which 22 representatives from STEM employers plus industry professionals and awarding bodies discussed the extent to which science A levels prepared school-leavers for success in the STEM workplace.

For more information about this study and Gatsby's Practical Work in School Science programme, please see our website: <http://www.gatsby.org.uk/Education/Projects/Review-of-Practical-Science-in-Schools.aspx>