The Association
for Science Education

Supporting success:
science technicians in schools and colleges

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Contents

Preparation of this report

This report has been endorsed by the Councils of the Royal Society and Association for Science Education. It has been prepared by the joint Royal Society / ASE working group on school and college science technicians.

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We would also like to express our thanks to Denise Wiles of Bedminster Downs School and Mark Williams and Michael Cope of Bristol City Council for providing the group with advice and information concerning the technicians' career and grading structure summarised in Appendix 4.

Summary

In July 2001 the Royal Society and the Association for Science Education published the results of a survey of science technicians in schools and colleges. At the same time, the working group responsible for the survey agreed to undertake further work to inform the national debate surrounding the role of technicians in science education, and in particular to examine whether action was required to strengthen technician support in schools and colleges. As part of its work, the group sought the views of Heads of Science via a telephone survey and examined comments regarding technicians in a sample of OFSTED and Further Education Funding Council inspection reports. Based on this work, the results of the survey of technicians and the working group's discussions, the Royal Society and the Association for Science Education have reached the following conclusions:-

- Technicians in schools and colleges have a vital role to play in the provision of high quality science education and, if they are to play this role to the full, all technicians must be supported in their work and accorded the professional status they deserve. Clear job descriptions for all technicians, linked to a national career structure and pay scale are required, as is substantial investment in technician continuing professional development.

- Science is a practical subject, and good quality 'hands-on' activities which involve students undertaking experimentation and investigative work add hugely to the experience of learning science. A well-trained, professional technician support service is essential if students are to experience such work.

- Up to 4,000 additional science technicians need to be recruited into schools in England in order to provide adequate technical support to all school science departments. A precise figure for the number of science technicians currently working in schools is not available.

- The profession of science technician is not attracting young recruits; this is perhaps unsurprising considering technicians' pay and conditions. If young people do not see the profession as an attractive and viable career option it seems unlikely that it will be possible to recruit several thousand more science technicians into the school system.

- Without adequate numbers of science technicians in schools and colleges the learning experiences of students will be impaired, raising levels of achievement will be made much more difficult, and safety in school and college laboratories will be compromised.

Recommendations

If young people are to have access to the best science education possible, the Royal Society and the Association for Science Education believe that all those involved in the education system must work towards implementing the following recommendations:-

1. The Government should commission work to investigate the level of science technician support in schools and colleges with the purpose of:
   a) accurately establishing how many more science technicians are required to redress the current shortage; and b) setting national guidelines on the management and deployment of technical staff.

2. The Government, working in partnership with union representatives and other bodies such as the ASE and CLEAPSS, should devise a nationally recognised career structure for science technicians, with different levels of technician showing progression of increased responsibilities, qualifications and/or experience.

3. Job descriptions of science technicians working in education should be urgently examined at a national level. As part of the work to establish a new career structure the Government, working in partnership with union representatives and others, should devise generic job descriptions for each level of technician.

4. Pay for each level of technician within the new career structure should reflect experience, responsibility and qualifications. The Government should establish and monitor national pay scales for school science technicians (and other support staff), perhaps by including support staff within the remit of a reformulated School Teachers' Review Body.

5. The National Occupational Standards for laboratory technicians working in education, and their associated S/NVQs, should be promoted more vigorously by the Department for Education and Skills (DFES) to schools in order to: a) provide a framework in which existing skills can be formally recognised; b) encourage technicians to continue to develop their skills throughout their careers; and c) support a career progression pathway.

6. The Government should make available to schools in England, through the Standards Fund or other appropriate mechanism, ring-fenced funding for the continuing professional development (CPD) of science technicians. It should be separate from, and in addition to, funds allocated for classroom assistants in other subjects. The total level of such funding should

be not less than £3 million per annum. The Scottish Executive Education Department, National Assembly for Wales Training and Education Department, and Department of Education for Northern Ireland should also make funds available for technician CPD on the same basis.

7. Heads of Science, Headteachers and Principals and Governors should ensure that science technicians in their school or college are encouraged and supported to undertake appropriate professional training throughout their career.

8. A nationally recognised induction programme should be included in the new career structure for science technicians. This programme should include competency based training, a skills audit and a development plan for every new technician.

9. Heads of Science, Headteachers and Principals and Governors should look critically at the way science technicians are managed in their school or college to ensure that the most efficient and effective practices are in place.

1 Introduction

In 2000 the Royal Society and the Association for Science Education, concerned about the dearth of up-to-date information available on the provision and responsibilities of science technicians working in education, decided to conduct a survey of the situation. Questionnaires were designed and sent by the ASE to technicians at over 4800 UK schools and colleges. The response rate was much higher than anticipated, with more than 5000 individual technicians from over 1900 institutions taking the time to complete and return the form. A joint ASE / Royal Society working group was established under the chairmanship of Sir John Horlock to consider the findings and a full analysis of the results was published in July 2001[1]. A summary of the main findings is also included in this report (see section 2.1).

Given the substantial response to the survey, the ASE and Royal Society agreed to widen the remit of the study and undertake further work to inform the national debate surrounding the role of technicians in science education, in particular to examine whether action was required to strengthen technician support in UK schools and colleges. To inform its work, the working group decided that the views of Heads of Science should be sought and, to this end, a representative sample of schools and colleges was identified and telephone interviews were conducted with over 200 Heads of Science. The working group also decided to examine comments regarding science technicians contained in a sample of OFSTED and Further Education Funding Council inspection reports. The results of both these pieces of research are summarised in section 2.3 of this report.

It became clear at an early stage of our work that the linked issues of technician job descriptions and career structure would be central to any attempt to strengthen technician support in schools and colleges. Comments from the technician survey indicated that many science technicians have job descriptions that are not entirely relevant and are often out of date. There was a strong call for nationally harmonised job descriptions allied to a clear career structure. The working group looked at three existing types of job structure for technicians: the comprehensive and long-standing structure adopted for university technicians; a structure under discussion in Bristol City Council schools; and a structure used in Northern Ireland. The issue of career development and job structures for technicians is discussed in section 3.

It is also obvious from the work we have undertaken that, perhaps unsurprisingly, the number of technicians available to support practical science varies between different types of school and college. The number of technicians per science lesson is lowest in comprehensive schools. Taking mean figures, grammar schools have 23% more technicians per science lesson than comprehensives, and independent schools have 29% more. We discuss the issue of provision of technicians, and the associated consequences, in section 4 of this report.

In addition to the results of the work outlined above, this report gives, in section 5, the recommendations of the joint ASE / Royal Society working group. These recommendations for action are the result of the group's deliberations and have been arrived at in the light of members' own experiences, the technician survey and the results of the work published here. As the Presidents of the Royal Society and ASE asserted in their joint foreword to our first report, technicians in schools and colleges have a vital role to play in the provision of high quality science education and, if they are to play this role to the full, all technicians must be supported in their work and accorded the professional status they deserve.

Science is a practical subject, and there is little dissent among science teachers from the view that good 'hands-on' activities which involve students undertaking experimentation and investigative work add hugely to the experience of learning science. The introduction to the current science National Curriculum[2] acknowledges one of the roles of practical science when it states: '*Because science links direct practical experience with ideas, it can engage learners at many levels. Scientific method is about developing and evaluating explanations through experimental evidence and modelling. This is a spur to critical and creative thought*.' This view is echoed by the House of Lords Select Committee on Science & Technology, in its 2001 report on school science,[3] which asserts that '*practical work catches the imagination of the young and can excite them about science from an early age*'. A recent study of pupils' views of the school science curriculum[4] also confirms the opinion widely held among science teachers that pupils '*expressed a greater interest in work that included opportunities for experimentation and investigation*.'

A well-trained, professional technician support service is essential if students are to experience a variety of experimental and investigative work. Without adequate numbers of science technicians in schools and colleges

1. Royal Society / Association for Science Education (2001), Survey of science technicians in schools and colleges. London: The Royal Society.
2. Department for Education & Employment / Qualifications & Curriculum Authority (1999), The National Curriculum. London: DFEE / QCA. Quote from p.102 of handbook for secondary teachers in England.
3. House of Lords Select Committee on Science & Technology (2001). Session 2000-2001 First report: Science in Schools. London: The Stationery Office.
4. Osborne, J. & Collins, S. (2000), Pupils' & parents' views of the school science curriculum. London: Kings College London.

the learning experiences of students will be impaired, raising levels of achievement will be made hugely more difficult, and safety in school and college laboratories will be compromised.

The Royal Society and ASE believe that the recommendations contained in this report are essential if young people are to have access to the best science education possible and we urge all those involved in science education to work towards their implementation.

2 The surveys

2.1 Survey of science technicians

In 2000, the Royal Society and ASE sent a questionnaire to technicians at 4859 UK schools and colleges with the aim of exploring the variety of duties carried out by technicians and to investigate their conditions of service. Completed questionnaires were received from 1917 schools and colleges (a 39.5% response rate) and from 5026 individual technicians. The survey thus yielded a unique database of information concerning the provision, roles, responsibilities, working conditions and opinions of laboratory technicians in secondary schools and colleges. A summary of the main findings of the survey is given below; additional information may be found in Appendix 1.

Summary of findings

The number of technicians per science lesson[5] was found to be lowest in comprehensive schools compared to other types of schools. In grammar and independent schools, technicians worked with fewer pupils while servicing comparable numbers of laboratories to colleagues in comprehensive schools (see Appendix 1). The number of technicians per science lesson was lower in Wales and Northern Ireland than in England. The survey found that Scotland also had fewer technicians per science lesson than England, although this was influenced by the fact that class sizes in Scotland are limited to a maximum of 20 (leading to more lessons each week).

Working conditions for technicians were extremely varied. Some worked alone, others were members of a team. 36% of institutions surveyed had science laboratories located on more than one site and 56% had laboratories on different floors; both these situations presented difficulties for technicians when moving equipment from lab to lab. Technicians suggested that breaks during the day were often difficult to take because of pressure of work and that working conditions (eg space and ventilation) in preparation rooms were given little consideration.

It was clear from responses to the survey that technicians wanted meaningful job descriptions which were allied to a clear career structure, perhaps built around nationally recommended 'core' job descriptions and linked to National Occupational Standards and Technical Certificates. Whilst four-fifths of technicians surveyed had job descriptions, many said these were not entirely relevant, were often out of date and rarely updated. Technicians supported a range of age groups, Key Stages, qualifications and science subjects and, in addition to their 'traditional' duties, skills required by technicians due to the introduction of new technologies appeared to be growing.

The ratio of female to male technicians was 3:1 and the age profile of technicians was skewed towards the older group, with 72% being over 40, and 8% being under 30. It seemed therefore that young people were not being recruited into schools and colleges as technicians. Many technicians enjoyed their work and found it satisfying, often mentioning the fact that they helped students to realise their potential. However, many were disillusioned because of their inability to progress as they gained experience and qualifications. There was also a general perception among technicians that school senior management did not understand the job of a technician and consequently did not value it.

Whilst over 60% of technicians surveyed were aware of the S/NVQ qualification for science technicians in education, less than 11% were working towards it. Two reasons were cited for the low uptake: a shortage of centres offering the qualification and the difficulty of obtaining funding for the accreditation process.

A full analysis of the technician survey results, together with representative quotes from technicians on a range of issues and twelve case studies (illustrating how technician support is being used in a range of schools and colleges) was published in July 2001 as the report '*Survey of science technicians in schools and colleges*'. Copies of this report may be obtained free of charge by sending an A4 self-addressed envelope marked 'Technicians Survey' to John Lawrence at the ASE, College Lane, Hatfield, AL10 9AA. The report is also available as a downloadable PDF file on both the ASE and Royal Society websites.

2.2 The views of Heads of Science

To assess the views of Heads of Science a representative sample of 240 schools and colleges was identified, chosen in the same proportions as the types of institutions from which technician replies had been received in the earlier technicians survey. In 2001, 209 Heads of Science were successfully contacted and a telephone questionnaire was used to gain insight into their views of the role of technicians in their schools and colleges. The main findings of the survey are given here; additional data, together with the list of questions asked, may be found in Appendix 2.

Summary of findings

One broad observation from the survey is the willingness of Heads of Science to talk about the situation in their schools and colleges. They were consistently complimentary about the contribution made by their technicians and it was clear that they valued this support highly.

5.Calculated as total number of technician hours per week divided by total number of hours of science teaching per week.

When asked what determined the number of technicians in their department and the number of hours technicians worked, approximately 5% of Heads of Science did not know or did not answer directly. Of the remaining 95% (199 responses), 39% of Heads of Science said the reason was historical; 14% said it was a decision taken by the headteacher, senior management or governors (although their decision may well be based on finances); 18% said it was financial; and 24% said it was based on pupil numbers, number of laboratories or teaching hours. Only 7% mentioned that the 1990 ASE formula for quality of technician function had been used.[6]

Overall, 45% of Heads of Science questioned said that they considered the level of technician support in their department to be inadequate. For the comprehensive schools 53% felt levels were inadequate; for sixth form and FE colleges (taken together) 20% felt levels were inadequate. This pattern is consistent with inspection observations, although (perhaps expectedly) teachers perceived the problem to be greater than did inspectors. Of the 22 independent schools surveyed, 3 had no technician support; for the remaining 19, only 5% said support levels were inadequate. 40% of Heads of Science in the grammar schools surveyed said there were inadequate support levels.

When asked about the contribution technicians make to the students' experience, almost all of the Heads of Science surveyed praised the work of their technicians. A common response concerned the opportunity to offer a "richer range of practicals"; Heads of Science clearly felt that adequate technician support was essential if students were to experience a variety of experimental and investigative work. In schools where the level of technician support was judged to be inadequate, Heads of Science commented that the amount of practical work they were able to offer students was seriously reduced, for example:

"Lessons are reduced to demonstrations and theory, and this seriously affects students' motivation."

"The technicians are unable to contribute to the students' experiences because of the pressure of just trying to get all the equipment out for lessons and tidying away. We could do so much more with students if we had more technicians."

"We cannot offer the amount and complexity of practical work that we would like to."

Quantitative evidence for improved students' achievement due to increased technician support was difficult to find. However, Heads of Science did mention improved performance and examination results, for example:

"Results have dramatically improved because of increase in technician hours and the work they do in terms of support on field trips, project work etc. Also reduces stress level of teaching staff which allows for better teaching and hence achievement."

"Improved grades due to more exciting practicals. Pupils are more engaged with the work and there are less behavioural problems."

80% of the Heads of Science in comprehensive schools invited technicians to departmental meetings, rising to 93% in sixth form and further education colleges.[7] The practice in grammar and independent schools, and in technology colleges, was similar to comprehensives. In all cases where technicians were invited to meetings they had the opportunity to contribute to agendas.

Overall, 174 Heads of Science (83%) said they themselves line-managed the department's technicians. In comprehensive schools this figure was 88%, while it was lower (73%) in sixth form and FE colleges. This may reflect different approaches to management in the further education sector. In grammar schools the figure was just 60%, while independent schools and technology colleges were similar to FE.

84 Heads of Science (40%) said their technicians were appraised each year. There was a marked difference in responses from comprehensive schools and further education. Across the comprehensives, only 35% of Heads of Science said their technicians were appraised annually, yet in sixth form and FE colleges this figure rose to 93%.

144 Heads of Science (69%) said that their technicians had direct contact with students. Examples of this contact included helping with practical and investigative work, demonstrating the use of equipment, and helping with IT (see Appendix 2 for more details). There was a marked difference in responses from comprehensive schools and further education. Across the comprehensives, 66% of Heads of Science said their technician had direct contact with students while in sixth form and FE colleges it was 100%. Often the use of technicians working with students was limited by time and availability. However, a number of Heads of Science said this was a technician role that they would like to be able to develop.

2.3 School and college inspection reports

To investigate what type of comments regarding technician provision and deployment featured in school and college inspection reports, in summer 2001 the working group examined a sample of OFSTED and Further Education Funding Council (FEFC) inspection reports.

6. Figures do not add up to 100% due to rounding.

7. In our survey of technicians only 19% said they attended departmental meetings either 'always' or 'frequently'. An additional 34% of technicians attended meetings 'occasionally', but 47% never attended. It is not clear whether non-attendance was because: a) the technicians were not invited; b) they chose not to attend; or c) they were unable to attend due to the scheduling of meetings after school and / or outside their working hours.

OFSTED reports

For maintained schools, 103 OFSTED reports of full inspection carried out since January 1999 were analysed.[8] To obtain our sample, every fifteenth LEA was selected from the alphabetical OFSTED list, giving 10 LEAs representing a mix of county and city, north and south. The first school inspected in each LEA from 1999 onwards was chosen for analysis, giving a variety of 11-16, 11-18 and 13-18 schools. Attainment varied amongst the schools in relation to national average and levels in similar schools. The quality of teaching was mostly good, though some were judged to be satisfactory only. Representative comments from OFSTED reports concerning the level of technician provision are given in Appendix 3.

Of the 103 OFSTED reports sampled, 71 contained specific mention of technicians. Inspectors frequently remarked on the excellent support provided by school science technicians. However, in 28 reports (27%) inspectors stated there were insufficient levels of technician support and a further 3 stated that support was only just adequate. In the view of OFSTED inspectors therefore, more than a quarter of the schools sampled had inadequate levels of technician support. Comments from inspectors about the *quality* of technician support were consistently favourable. Where this was the only issue, comments tended to be brief using adjectives ranging from *effective* through *good and hard working* to *excellent*.

FEFC reports

Prior to the creation of the Learning and Skills Council, the FEFC was responsible for the inspection of incorporated further education colleges, including sixth form colleges. The inspection process graded cross-college and curriculum provision. For this exercise we analysed the reports of all colleges with a grade 1 (the highest grade) and all colleges with a grade 4 for science provision. Grade 5 is actually the lowest grade possible, but this was not given for any college's science provision. The grades can be slightly misleading however as occasionally the curriculum area graded was science and mathematics rather than simply science. The Annual Reports of the Chief Inspector and the 'Curriculum Area Survey Report: Sciences, March 1998' were also considered, and quotes from these can be found in Appendix 3 along with representative quotes from the FEFC reports.

Technicians were specifically mentioned in 12 out of 14 grade 1 colleges and in 9 out of 19 grade 4 colleges. However, there were no negative comments about the quality of support. In no cases did the inspectors suggest there was an inadequate level of support. Praise was frequently given for the quality of the technicians' work.

2.4 International comparisons

A brief survey was carried out regarding technician provision in a number of other countries by contacting a number of colleagues working abroad. In general, where countries have technicians the situation seems to be much as it is in the UK. Teachers from countries where there was no technician support (such as Finland, Germany, Ireland and Poland) commented on the constraints this had on the practical work their students could undertake and the type of learning experience that could be offered to students. With the limited data available to us we have resisted the temptation to go beyond this assessment of the situation because different countries have different science curricula, different levels of teacher workload and approach the issue of technical support in a variety of ways. We do consider, however, that there would be value in research being undertaken to look at science technician provision in other countries to examine possible correlation with students' experience of practical science.

As the responses received were anecdotal we have not drawn firm conclusions from them, but they do provide a useful glimpse of the situation in other countries and so are included for information on the Royal Society's website at www.royalsoc.ac.uk/education.

8. This represents about 2% of all secondary schools.

3 A recognised profession for school technicians?

3.1 Introduction

As described above, one message that emerged from our survey of Heads of Science was that well-trained, professional technicians are essential if students are to experience a variety of experimental and investigative work. However, from the comments received in the technicians survey it is clear that, whilst they are greatly valued within the science department, there is a perception that senior management does not understand the job of a science technician and consequently does not value it. Science technicians often fall between being recognised as full members of the science department and being viewed as auxiliary staff (eg caretakers and office staff). Initiatives which seek to raise awareness of the immense contribution technicians make to science education should therefore be welcomed, and we commend the Salters Institute for initiating the '*National Science Technician Awards*'.[9] Much more effort in this direction is required however.

The profession of science technician is not attracting young recruits – the percentage of technicians under 30 years of age is low and falling, from 10% in 1994 to 8% in 2000.[10] While this is in itself is perhaps not a cause for concern, it is symptomatic of the state of technicians' pay and conditions. If young people do not see the profession as an attractive and viable career option it is not clear that it will be possible to recruit several thousand more science technicians into the school system (see section 4.1).

In general, the technicians we surveyed felt underpaid and often commented that they have been in the same position for many years at the same grade with no opportunity for promotion.[11] This was despite the fact that their role had developed to require higher level skills as new technologies were introduced and more time spent working with students and undertaking administration. Many technicians also commented that their job descriptions were often out of date and rarely updated. 60-70% of technicians do not have formal annual appraisals and so lack the opportunity to discuss their performance, training requirements and ambitions for the future.

If the UK education system is to capitalise on the opportunities provided by a professional technician support system it is essential that the situation changes; if the current circumstances persist, raising pupils' achievement in science will be made immensely more difficult. There is a simple, fundamental rationale: the better trained technicians are, the better the support and advice they will be able to offer science teachers. Better supported teachers lead to improved science education for young people. Continuing professional development of teachers is now firmly established as a priority in science education,[12] and rightly so. It is in the interests of good science education that we now invest also in the professional development of science technicians. Such professional development is best delivered locally and as part of a clear career structure in which achievements are recognised and the opportunity to progress is a real one.

3.2 Career structure and job descriptions

There is a real and urgent need to establish a nationally recognised career path for science technicians working in education, with different levels of technician showing progression of increased responsibilities, qualifications and / or experience. We believe that it will only be possible to put in place such a career structure if it is accompanied by national criteria for describing the tasks and competencies at each level and we call upon the Government to work in partnership with union representatives and other bodies, such as the ASE and CLEAPSS, to devise such criteria and a career structure. At the same time, technician job descriptions must be examined at a national level and generic job descriptions drawn up by the Government working in partnership with union representatives and others. It will be important that national criteria and job descriptions recognise local differences in the science curriculum and the different ways in which science departments are managed. It follows that there should also be national guidelines on pay for each level of technician, reflecting experience, responsibility and qualifications. We recommend therefore that the Government investigates ways to establish and monitor national pay scales for school science technicians (and presumably other school support staff), perhaps by including support staff within the remit of a reformulated School Teachers' Review Body (STRB).

The working group has not attempted to devise detailed job descriptions for the different levels of technician, but we do suggest that an appropriate career structure might have four levels, eg:

9. The National Science Technician Awards are due to be launched by the Salters Institute in 2002. See www.salters.co.uk or email institute@salters.co.uk for more details.
10. During the same period (1994-2000) the proportion of technicians over the age of 40 rose 4% to 72%. Figures taken from 1994 ASE survey of technicians and 2000 Royal Society / ASE survey.
11. Under the 1997 single-status agreement, many Local Education Authorities have instigated a review of school support staff salaries. In some cases such reviews have been based on job evaluation criteria which bear little relation to the actual duties of science technicians and have led to technician salary levels being lowered or frozen.
12. See, for example, the Council for Science and Technology report 'Science Teachers' (2000) and the House of Lords Select Committee on Science & Technology report 'Science in Schools'.

1. 'Trainee science technician'
2. 'Science technician'
3. 'Senior science technician'
4. 'Science technician team leader' **or** 'Advisory science technician' **or** 'Advanced skills science technician' **or** 'Science technician demonstrator'

At the highest grade (4), we recognise that there is likely to be a need for flexibility by means of a range of job descriptions referring to the particular tasks / responsibilities undertaken. Similarly we recognise that in order to rise to the higher levels it is likely that many technicians will need to move between institutions and perhaps geographical regions during their career; a nationally recognised career structure and job descriptions would facilitate this mobility. Such a career structure would also help facilitate opportunities for technicians in schools and colleges to move to positions in the industrial and higher education sectors and vice versa.

Whilst not trying to produce full job descriptions for the four levels ourselves, we have noted on-going work in this area, particularly by the Consortium of Local Education Authorities for the Provision of Science Services (CLEAPSS)[13] and the Joint Bristol Scheme (see Appendix 4) and we commend this work as a useful starting point.

3.3 Continuing professional development

At the same time as drawing up a national career structure for technicians, the National Occupational Standards for laboratory technicians working in education and their associated S/NVQs should be promoted more vigorously by the DFES to schools in order to: a) provide a framework in which existing skills can be formally recognised; b) encourage technicians to continue developing their skills throughout their careers; and c) support a career progression pathway.

The new national career structure should reflect, and where appropriate make explicit reference to, the competencies outlined in the National Occupational Standards. One worrying fact brought to light in our survey of technicians was that whilst 61% of technicians were aware of the S/NVQs, less than 11% were working towards them. Two main reasons were cited for this low uptake: a lack of centres offering the qualification and the difficulty in obtaining funding for the accreditation process. Both these factors need to be addressed.

The Royal Society and ASE call upon the Government to make available funding, through the Standards Fund or other appropriate mechanism, for the continuing professional development of science technicians. Such funding should be 'ring-fenced' in recognition of the unique contribution that science technicians make to the education of young people. It should be separate from, and in addition to, any funds allocated for classroom assistants in other subjects. We suggest that the total of such funding available should be not less than £3 million per annum.

We similarly call for the Scottish Executive Education Department, National Assembly for Wales Training and Education Department, and Department of Education for Northern Ireland to make funds available for technicians on the same basis. We consider that once this funding is announced, and demand for professional training and qualifications rises, more training providers will begin to offer technician training and more centres will offer S/NVQ qualifications. The situation should, however, be closely monitored to confirm an increase in the availability of training and centres and an appropriate distribution across the country – this will be particularly important since many technicians are unable to travel long distances for training due to, for example, lack of transport or childcare arrangements. At the same time, Heads of Science, Headteachers and Principals and Governors should ensure that science technicians in their schools or colleges are encouraged and supported to undertake appropriate professional training throughout their career.

A career structure should also include a nationally recognised induction programme for science technicians. This should include competency based training, a skills audit and a development plan for every new technician. The National Occupational Standards for laboratory technicians working in education are currently under review by the Science, Technology & Mathematics Council, and, at the time of writing, discussions regarding the introduction of a Level 1 qualification are underway. It seems sensible to examine whether the competencies required for such a qualification could or should form the basis of an induction programme for new technicians. We also note that the Advanced Modern Apprenticeship for science technicians working in education was approved in 2001. This apprenticeship is based upon the NVQ level 3 and provides a planned training programme in the workplace and we commend its introduction.

13. CLEAPSS (www.cleapss.org.uk) has recently seconded a technician to work three days a week on a new project looking at 'Technicians and their jobs'. The outcome, in 2003, will be guidance covering aspects such as technician job descriptions, salaries and grades, working conditions, qualifications, and induction.

4 Number and management of technicians

4.1 Number of technicians required

Comments received during our survey of Heads of Science support the widely held view that the level of technician provision in a school or college affects both the quality of science education experienced by students and the overall effectiveness of the science department. Yet in our sample of 103 OFSTED reports, 27% of schools were judged by inspectors to have insufficient levels of science technician support.[14] Overall, 45% of the 209 Heads of Science surveyed considered the level of technician support in their department to be inadequate; for comprehensive schools this figure was 53%.

To ensure that all young people experience the necessary variety of experimental and investigative work, all schools and colleges must have adequate levels of technician support. It is clear that this is not currently the case. However, arriving at a formula for assessing how many technicians a school or college requires is not a trivial task. Whilst the amount of science taught is clearly the most significant factor in determining amount of technician support required, there are a range of other factors which affect it including:

- the location of laboratories (eg are they on different floors or in different buildings or on different sites?);
- the proportion of time the laboratories are used for teaching;
- the pattern of use of laboratories (eg if all physics is taught in one or two labs then less movement of apparatus will be required);
- the amount of storage space available for science equipment (insufficient storage space may necessitate frequent moving of apparatus between labs, prep rooms and stores);
- other calls on technician time (eg general AV support, etc).

In 1990, the ASE devised a simple formula to provide guidance about the amount of technician support required in schools.[15] In it, a 'service factor' is defined as:

$$\text{Service factor} = \frac{\text{Technician hours per week}}{\text{Hours of science teaching per week}}$$

Comparing the results of our survey of technicians with comments from inspectors, a clear relationship seems to emerge. Inspectors reported 27% of state schools as having insufficient technician provision, yet there were no such comments in the FEFC inspection reports for the sixth form and general FE colleges sampled. This corresponds to the service factors calculated for comprehensive schools, sixth form colleges and further education colleges.[16]

Type of institution	Service factor (median)
Comprehensive schools	0.47
Grammar schools	0.58
Sixth form colleges	0.62
General FE colleges	0.70

The suggestion from this analysis is that a service factor of around 0.65 is the minimum necessary to provide adequate technical support to a science department. But we recognise that this is a crude measure, not least because the management and deployment of the technician resource within a school or college is as important as the number of technicians. The results of our work do however convince us that the current number of science technicians in maintained schools is substantially too low, perhaps by as much as 40%.

A precise figure for the number of science technicians currently working in schools is not available. In DFES surveys, schools are requested to identify the total number of technicians working in the school (including science technicians, design & technology assistants and IT technicians), and a disaggregated figure for science technicians does not exist.[17] However, a reasonable estimate for the number of science technicians in schools in England would be 10,000. Working to this estimate, the above analysis suggests that up to 4,000 additional science technicians need to be recruited in England alone.

4.2 Management of technicians

In our sample of inspection reports the high quality of support provided by science technicians in schools and colleges is consistently highlighted. Even in schools and colleges where science provision is weak, the work of technicians is often acknowledged and praised. But some comments within OFSTED inspection reports do raise issues concerning the effective management and training of technicians. For example:

> *"Two competent science technicians give good support but their line management, outside the department, causes inefficiencies in their deployment."*

14. See Appendix 3 for a selection of representative comments taken from our sample of OFSTED reports.
15. A description the ASE service factor is given in sections 2.1-2.3 of 'Survey of science technicians in schools and colleges'.
16. See page 31 of 'Survey of science technicians in schools and colleges' for full analysis of service factors.
17. For aggregated figures of technician numbers, see Department for Education & Skills (2001), Statistics of Education: Schools in England 2001. London: The Stationery Office.

"The lack of centralised space for preparation of materials and administration of the department makes efficient management of the very good technical support difficult and seriously limits the extent to which teachers can share good practice and support each other."

"In-service training for teachers has been undertaken and has been adequate, but the level of technician training has been low in recent years."

It is clear from inspection reports that involving technicians as full members of the science team, together with appropriate training and development, leads to the most effective technical support. This view is substantiated by comments from technicians themselves and from Heads of Science.

Management considerations also include whether technicians are to be employed on a term-time only contract or for a full 52-week year. Term-time only contracts can provide attractive career opportunities, particularly for people with family responsibilities, but they can also deter others from entering the profession. For the majority of schools the most practical solution will be for routine maintenance of laboratory equipment and major stocktaking to be undertaken by a technician outside of term time. A technician on a full-year contract will also be able to undertake other duties, for example caring for plants and animals in the science department during school holidays. Thus it will be usually be the case that **at least** one technician in every school will need to be employed for a 52-week year.[18]

4.3 Conclusions

We conclude that the Government should commission work to investigate the level of science technician support in schools and colleges with the purpose of: a) accurately establishing how many more science technicians are required to redress the current shortage and; b) setting national guidelines on the management and deployment of technical staff. As a step towards this we recommend that, when seeking information from schools, the Government identifies science technicians separately from other support staff such that the number of science technicians may be accurately established and monitored.

We also encourage Heads of Science, Headteachers and Principals and Governors to look critically at the way science technicians are managed in their school or college to ensure that the most efficient and effective practices are in place.

In our first report we drew attention to the variety of working conditions for science technicians. The DFEE Building Bulletin 80[19] makes recommendations about the number, arrangement and size of laboratories and preparation rooms and we trust that the Government's commitment to modernise school buildings[20] will see all school science departments brought up to the standards outlined in Building Bulletin 80.

18. If only one technician is employed to work during school holidays, risk assessments will show that certain activities will be unsafe to undertake if s/he is working alone.

19. Department for Education & Employment (1999), Building Bulletin 80: Science accommodation in secondary schools. London: The Stationery Office.

20. In the 2001 DFES White Paper 'Schools achieving success' the Government undertakes to increase its capital investment in schools from £2.2 billion in 2001/02 to £3.5 billion in 2003/04.

5 Conclusions and recommendations

5.1 Conclusions

Based on the work described in this report, the results of the survey of technicians and the working group's discussions, the Royal Society and the Association for Science Education have reached the following conclusions:-

- Technicians in schools and colleges have a vital role to play in the provision of high quality science education and, if they are to play this role to the full, all technicians must be supported in their work and accorded the professional status they deserve. Clear job descriptions for all technicians, linked to a national career structure and pay scale are required, as is substantial investment in technician continuing professional development.

- Science is a practical subject, and good quality 'hands-on' activities which involve students undertaking experimentation and investigative work add hugely to the experience of learning science. A well-trained, professional technician support service is essential if students are to experience such work.

- Up to 4,000 additional science technicians need to be recruited into schools in England in order to provide adequate technical support to all school science departments. A precise figure for the number of science technicians currently working in schools is not available.

- The profession of science technician is not attracting young recruits; this is perhaps unsurprising considering technicians' pay and conditions. If young people do not see the profession as an attractive and viable career option it seems unlikely that it will be possible to recruit several thousand more science technicians into the school system.

- Without adequate numbers of science technicians in schools and colleges the learning experiences of students will be impaired, raising levels of achievement will be made much more difficult, and safety in school and college laboratories will be compromised.

5.2 Recommendations

If young people are to have access to the best science education possible, the Royal Society and the Association for Science Education believe that all those involved in the education system must work towards implementing the following recommendations:-

1. The Government should commission work to investigate the level of science technician support in schools and colleges with the purpose of: a) accurately establishing how many more science technicians are required to redress the current shortage; and b) setting national guidelines on the management and deployment of technical staff.

2. The Government, working in partnership with union representatives and other bodies such as the ASE and CLEAPSS, should devise a nationally recognised career structure for science technicians, with different levels of technician showing progression of increased responsibilities, qualifications and/or experience.

3. Job descriptions of science technicians working in education should be urgently examined at a national level. As part of the work to establish a new career structure the Government, working in partnership with union representatives and others, should devise generic job descriptions for each level of technician.

4. Pay for each level of technician within the new career structure should reflect experience, responsibility and qualifications. The Government should establish and monitor national pay scales for school science technicians (and other support staff), perhaps by including support staff within the remit of a reformulated School Teachers' Review Body.

5. The National Occupational Standards for laboratory technicians working in education, and their associated S/NVQs, should be promoted more vigorously by the Department for Education and Skills (DFES) to schools in order to: a) provide a framework in which existing skills can be formally recognised; b) encourage technicians to continue to develop their skills throughout their careers; and c) support a career progression pathway.

6. The Government should make available to schools in England, through the Standards Fund or other appropriate mechanism, ring-fenced funding for the continuing professional development (CPD) of science technicians. It should be separate from, and in addition to, funds allocated for classroom assistants in other subjects. The total level of such funding should be not less than £3 million per annum. The Scottish Executive Education Department, National Assembly for Wales Training and Education Department, and Department of Education for Northern Ireland should also make funds available for technician CPD on the same basis.

7. Heads of Science, Headteachers and Principals and Governors should ensure that science technicians in their school or college are encouraged and supported to undertake appropriate professional training throughout their career.

8. A nationally recognised induction programme should be included in the new career structure for science technicians. This programme should include competency based training, a skills audit and a development plan for every new technician.

9. Heads of Science, Headteachers and Principals and Governors should look critically at the way science technicians are managed in their school or college to ensure that the most efficient and effective practices are in place.

Appendix 1: Data from survey of science technicians

As described previously, a full analysis of the results of the technician survey is available as a separate report, '*Survey of science technicians in schools and colleges*'. The report also includes representative quotes from technicians on a range of issues and, to help put the survey results into context, twelve case studies outlining how technician support is being used in a selection of schools and colleges. The report is available free of charge by sending an A4 self addressed envelope to John Lawrence at the ASE.

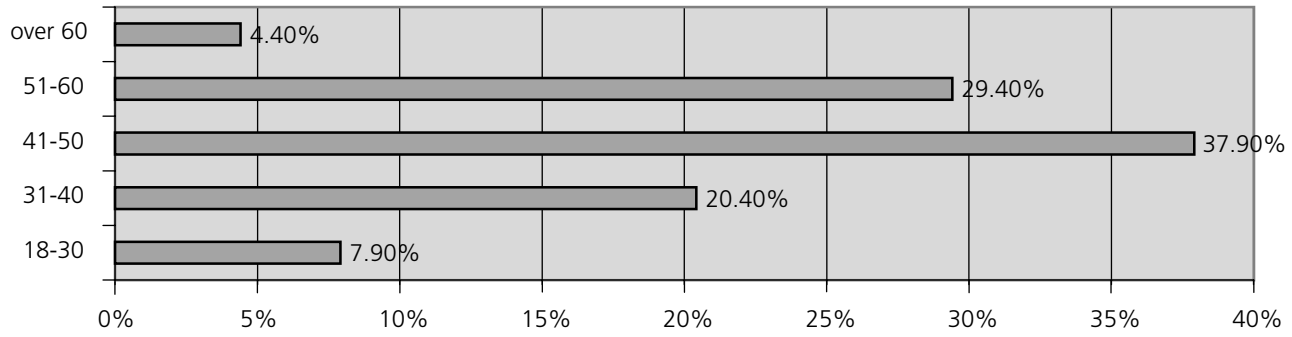
The following tables and charts are taken from our first report.

Table 1: Data obtained from the survey of technicians regarding average school size, number of laboratories and technicians

	(A) Mean number of pupils on roll	(B) Mean number of prep rooms	(C) Mean number of labs	Technicians (D) Mean technician hours per week	Technicians (E) No. of FTE technicians*
All schools	900	2.5	7.8	77	2.1
Comprehensive (all)	973	2.5	7.7	75	2.0
in Scotland	877	2.2	9.1	68	1.8
not in Scotland	980	2.5	7.6	76	2.1
Grammar	867	3.4	8.3	97	2.6
Independent	482	2.5	6.9	79	2.1
VI form college	–	2.5	6.8	94	2.5
FE	–	2.3	5.2	88	2.4

* The full-time equivalent (FTE) technician is assumed to work 37 hours a week, so column (E) = (D) / 37

Chart 1: Technician age profile



The following table and charts, also taken from our first report, give the distribution of service factor for different types of schools and colleges, calculated as:

$$\text{Service factor} = \frac{\text{Technician hours per week}}{\text{Hours of science teaching per week}}$$

Table 2: Analysis of the distribution of service factor between different types of schools

	Comprehensive	Grammar	Independent	6th Form Colleges	FE Colleges
Max	1.17	1.00	1.84	1.68	2.22
3rd Quartile	0.57	0.68	0.74	0.96	1.06
Median	0.47	0.58	0.59	0.62	0.70
1st Quartile	0.37	0.46	0.41	0.52	0.48
Min	0.09	0.19	0.17	0.20	0.14
Mean	0.48	0.59	0.62	0.74	0.82
Standard Deviation	0.16	0.21	0.28	0.32	0.46
Range	1.08	1.36	1.67	1.48	2.07
Count	1406.00	93.00	223.00	38.00	73.00
Confidence Level (95.0%)	0.01	0.04	0.04	0.10	0.11

Chart 2: Comparison of service factors in different type of institutions

Service factors are compared below as a 'box-plot'. Each of the five central boxes in the chart below has its ends at the quartiles and hence spans the middle half of the data. The horizontal line within each box marks the median. The vertical lines extend from the boxes to the smallest and largest observations.

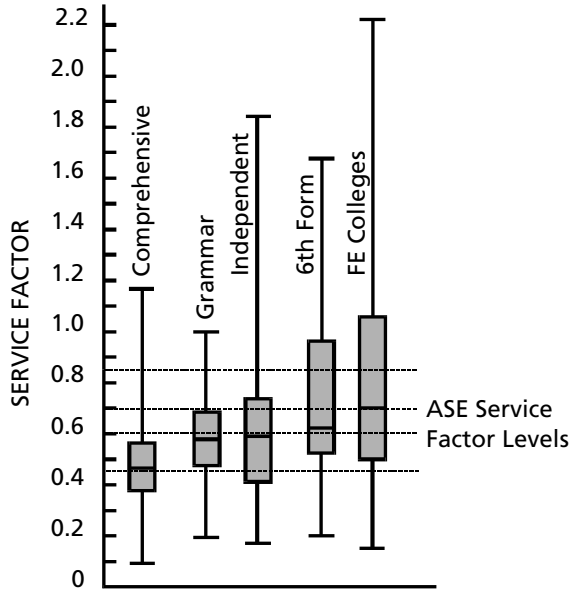


Chart 3: Distribution of service factor in comprehensive schools

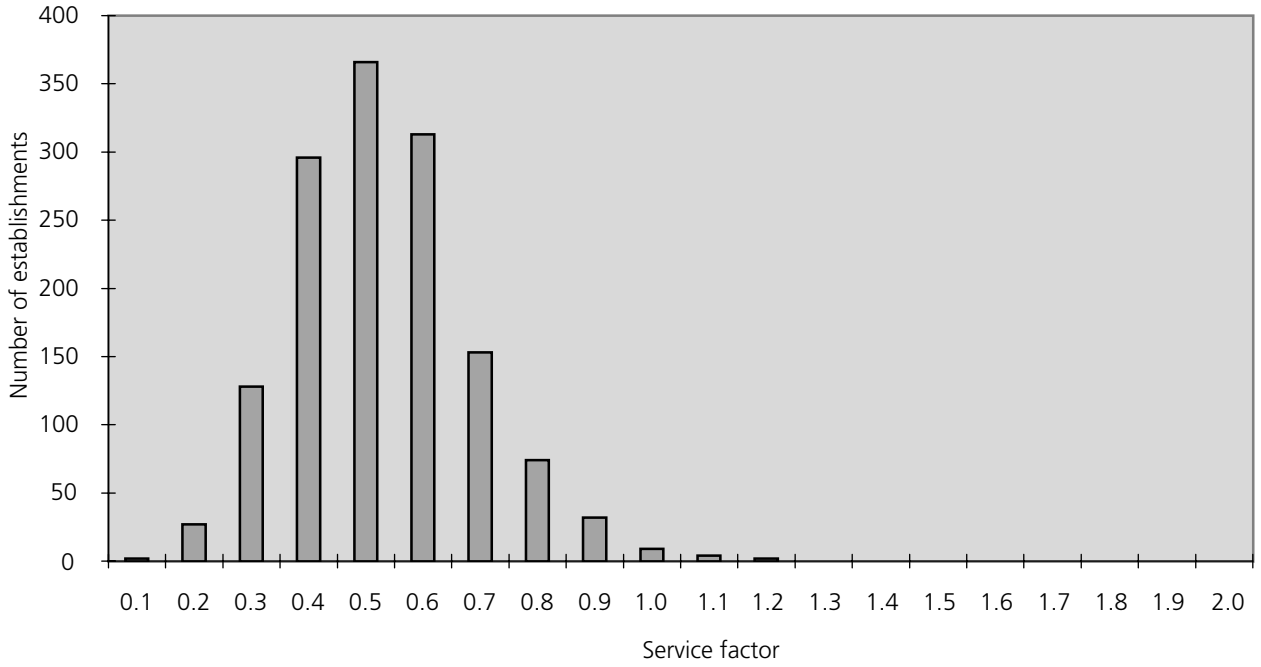


Chart 4: Distribution of service factor in grammar schools

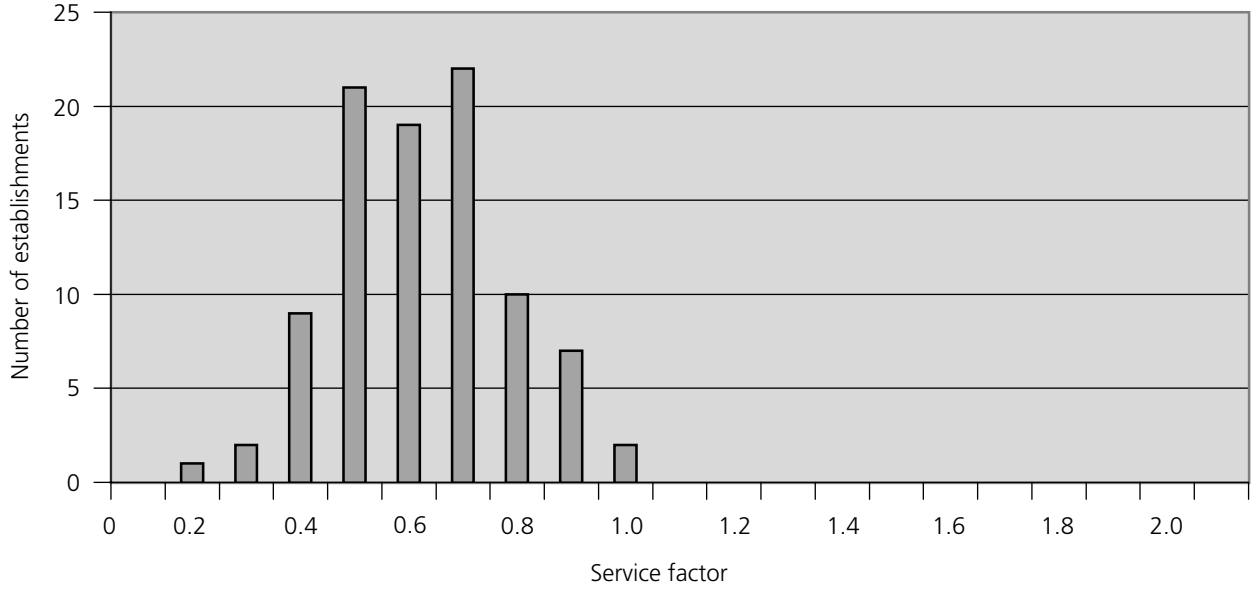


Chart 5: Distribution of service factor in independent schools

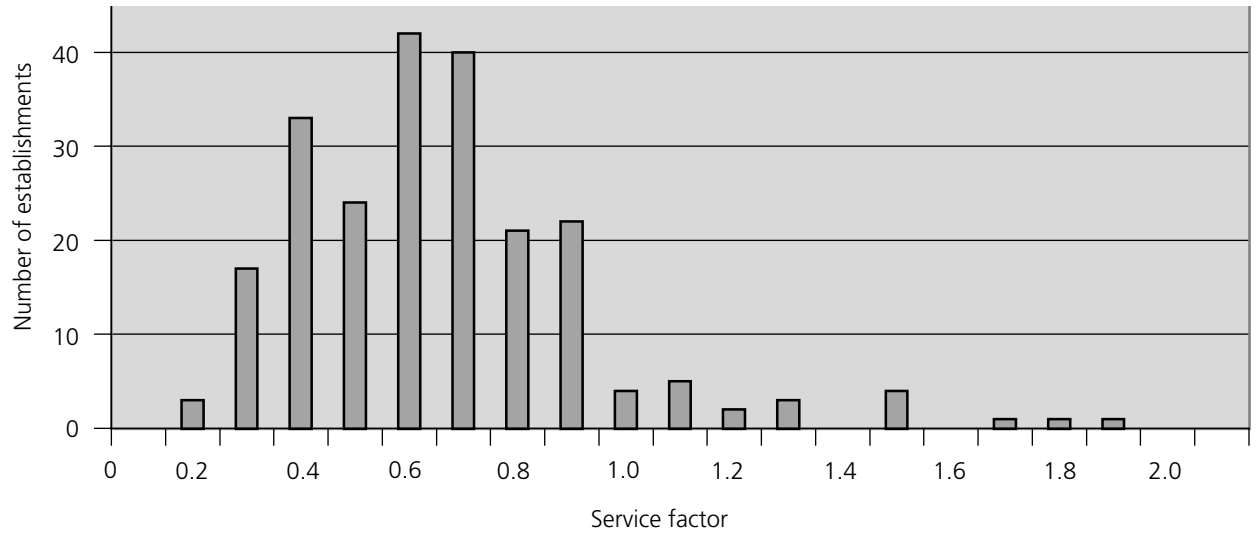


Chart 6: Distribution of service factor in sixth form colleges

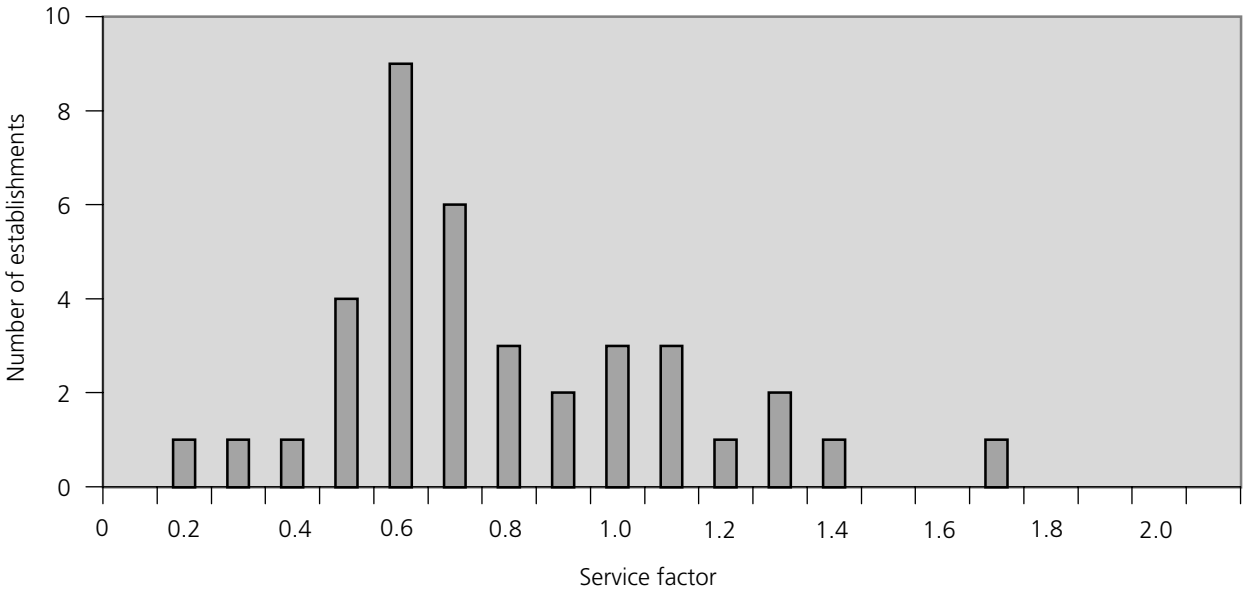
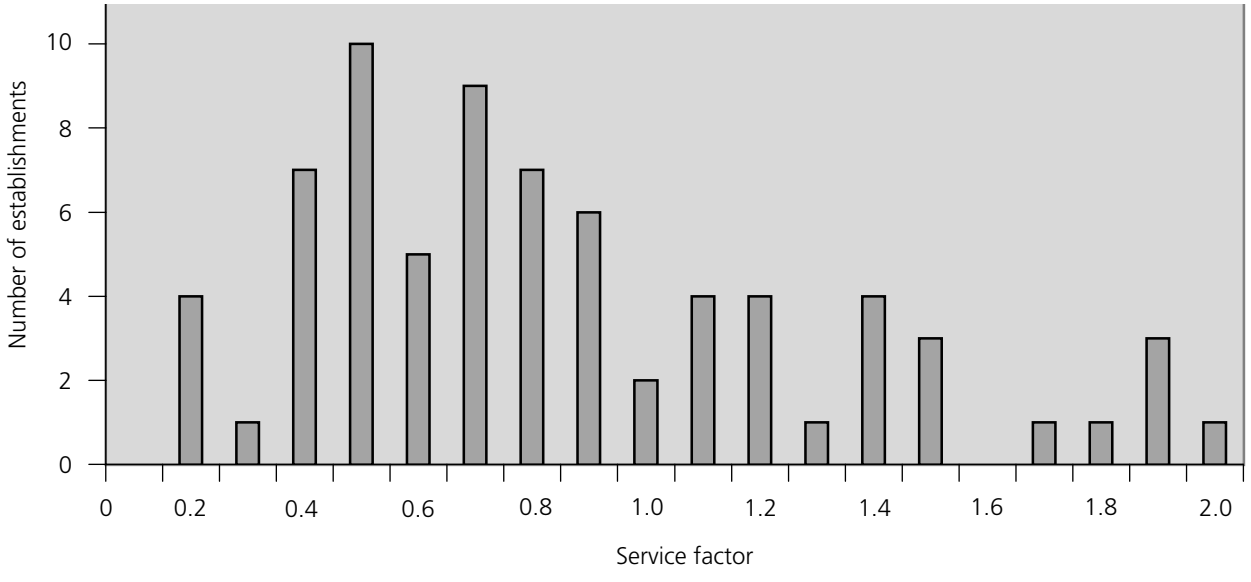


Chart 7: Distribution of service factor in colleges of further education



Appendix 2: Data from survey of Heads of Science

As described earlier, a telephone survey was conducted in June 2001 with 209 Heads of Science to seek their views on technician provision and support in their departments. Section 2.2 of the main report outlines the findings of the survey. In this appendix we list the questions asked and include resultant data not included in the main report.

Question 1: What determines how many technicians you have and the hours they work?

	Comprehensive schools	Sixth form colleges	FE colleges	Technology colleges	Grammar schools	Independent schools
Finance	28		2		2	3
Headteacher or senior management	21			1	2	1
History	56	4	2	1	7	7
Laboratories	11		1	1	3	3
Governors	2					
Contact hours	16	1	4	2	1	4
Mention of ASE formula	12					1
Total	**146**	**5**	**9**	**5**	**15**	**19**

Question 2: Do you consider your level of technician support adequate?
See section 2.2 of main report and table of yes / no answers on page 20

Question 3: What evidence do you have that technician support adds to the students' experiences and achievement?
See section 2.2

Question 4: Do you invite the technicians to departmental meetings?
See section 2.2 and table of yes / no answers on page 20

Question 5: What are the four most important tasks that your technicians carry out?
The free-response nature of the question meant that some judgments were needed to allow categorisation and subsequent analysis of the data.

Task	Number of responses
Preparation for lessons (especially practicals) and that which it involves	191
Stock control	142
Maintenance of equipment	79
Health and safety	66
General administrative duties (including photocopying)	56
Maintenance of laboratories and other work areas	32
Supporting the science team	20
Support in the classroom	16
Supporting the use of ICT	14
Looking into new ideas for practical work	11

All other tasks given were in single figures.

Question 6: Do you have a senior technician? If the answer is 'yes', what are his/her additional responsibilities?
A total of 143 (68%) institutions had senior technicians (see table of yes / no answers for breakdown between institutions). In some instances there was only one technician, but s/he had been designated senior technician. Again, because of the free-response nature of the question, some interpretation was used to categorise them. However, it was clear that the most frequently mentioned additional responsibilities related to:

- responsibility for other technicians (though this ranged from 'monitoring' to 'managing'): 50% of replies included this reason;
- stock control and involvement with budgets: 39% of replies included this reason.

These percentages may be rather higher since other responses, while not specifically giving these reasons, gave "*organises and oversees all practical work*" and "*administration of the science department*" as the additional responsibilities. These could be interpreted as overseeing the work of other technicians and stock control respectively.

Question 7: Are you the technicians' line manager? If the answer is 'no', who is their line manager?
Where the Head of Science was not the technicians line-manager, the following were said to be:

	Number of responses	Percentage of total
'Academic'		
Deputy head (or equivalent)	4	
Second in department	2	
Subject heads (or equivalent)	16	
Sub total	*22*	*40%*
'Non-academic'		
Bursar	8	
Business or financial manager	6	
Administration or personnel	9	
Sub total	*23*	*42%*
'Mixed'		
Head and Science and Bursar	6	
Head of Science and Personnel/Admin	3	
Head of Science and subject head	1	
Sub total	*10*	*18%*
Total	**55**	**100%**

Question 8: Do the technicians have job descriptions? If the answer is 'yes', who produced them?
192 Heads of Science (92%) asked said their technicians had job descriptions. There was a spread of people responsible for producing these. Often the Head of Science had inherited them. Several said that the job descriptions were currently under review.

Job descriptions produced by	Number of responses
Head of Science *	95
Headteacher or senior management	11
Senior technician	2
Head of Science in conjunction with personnel	13
Head of Science in conjunction with headteacher / senior management **	31
Head of Science in conjunction with bursar / business manager etc**	14
School based upon LEA guidelines	11
Don't know	15
Total	**192**

* where the Head of Science produced the job description it was often in liaison with the technicians
** in a few cases this was done without reference to the Head of Science

Question 9: Are the technicians appraised each year?
See section 2.2 and table of yes / no answers on page 20

Question 10: Do your technicians have direct contact with students? If the answer is 'yes', please give some examples.

144 Heads of Science (69%) said that their technicians had direct contact with students. Examples of this contact included:

Examples of technician contact with students	Number of responses
Helping with practical and investigative work	59
Demonstrating the use of equipment and/or experiments	34
Being present in the classroom	27
Helping with IT (including data logging)	24
Working with small groups or individuals	11
Trouble-shooting	8
Field trips	5
Total	**168**

Question 11: Who determines the acceptable workload for the technicians and prioritises their tasks?

Workload is largely determined by what the teachers asked for and technicians prioritise and manage it. More than one Head of Science said "*It just happens*". In response to the question, Heads of Science answered as follows:

Technician workload determined by:	Number of responses
The technicians themselves	61
Head of Science	45
Head of Science and Senior Technician	24
Head of Science and technician	39
Senior Technician	31
Administrative line manager	4
Total	**204**

Summary of answers to yes / no questions

Question	Total [209]		11-13 Comp [1]		11-16 Comp [47]		11-18 Comp [106]		Further Education [9]		VI Form College [6]		Grammar [15]		Ind [22]*		Tech College [4]	
	Yes	%	Yes	%	Yes	%	Yes	%	Yes	%	Yes	%	Yes	%	Yes	%	Yes	%
2. Do you consider your level of technician support adequate?	114	55	0	0	20	43	53	50	7	78	5	83	9	60	18	95	2	50
4. Do you invite the technicians to departmental meetings?	160	77	1	100	45	96	77	73	9	100	5	83	7	78	13	68	3	75
6. Do you have a senior technician?	143	68	1	100	34	72	75	71	7	78	4	67	9	60	10	53	3	75
7. Are you the technicians' line manager?	174	83	1	100	42	89	93	88	6	67	5	83	9	60	15	79	3	75
8. Do the technicians have job descriptions?	192	92	1	100	41	87	99	93	9	100	6	100	15	100	17	89	4	100
9. Are the technicians appraised each year?	84	40	0	0	14	30	40	38	8	89	6	100	7	47	6	32	3	75
10. Do your technicians have direct contact with students?	144	69	0	0	31	64	70	66	9	100	6	100	12	80	13	68	3	75

* 3 independent schools reported no technicians, so percentages are based on 19 replies

Appendix 3: Comments from inspection reports

As discussed in section 2.3 of the main report, comments regarding technician provision and management in a sample of OFSTED and FEFC inspection reports were analysed. Representative comments from these reports are given below.

OFSTED

The amount of technical support is insufficient to service the high levels of practical work and also to ensure that all health and safety measures are in place.

Technical support is excellent, though inadequate to service five laboratories and to support the extensive range of practical work carried out by the department.

Technical support is barely sufficient for a department of this size: the technicians provide very valuable assistance but there are only two of them and one is part time.

The well-qualified teachers are well supported by reliable technicians who are under pressure of time to service the nine laboratories.

The quality of teaching is well supported by the excellent work of the laboratory technicians. These people work under very difficult conditions yet always have the apparatus and equipment ready for lessons and, as if by magic, clear it away efficiently again afterwards. There has been some improvement since the last inspection but the quality of teaching and learning would be improved if there were more laboratory technicians.

Two of the science laboratories have been refurbished but the other two are in urgent need of improvement. Storage is a serious problem. The laboratories which are in constant use are on two floors and although the technician is very efficient, there is a need for more support to service the demands of a very practically oriented curriculum.

The department is well supported by an inexperienced technician, but support time is poor for the range of courses on offer and the number of laboratories which have to be serviced.

Two technicians provide valuable support but despite an increase in hours worked, they continue to have an excessive workload, identified in the last report.

The teaching staff are well supported by two very hard working technicians. At the last inspection there were three technicians and so there has been an erosion in the amount of support staff.
[Note: the school had nine laboratories]

Technical support has improved since the last inspection but it is still inadequate.

Further Education Funding Council

Representative comments from grade 1 college reports:

Well-qualified administrative, technicians and support staff work flexibly with teachers to assist students in achieving their learning goals. For example, the two part-time science technicians adjust their hours of attendance throughout the year to meet the varying demands on their services.

…effective technical support for teaching and learning. Communication between all staff is good.

In some curriculum areas, for example chemistry, technicians are invited to all departmental meetings and contribute fully to the decision-making process. The level of technician support is good; each science subject has a dedicated technician who has appropriate experience and qualifications. Laboratories are well managed and clean.

Technical staff are appropriately qualified and experienced. They provide good support for teaching.

The technicians, of whom 50% are part time, are well qualified and provide good assistance to learning.

Most technician staff are well qualified and are experienced. They work well with teachers and their contribution is appreciated.

Representative comments from grade 4 college reports:

The technician support for science is excellent. The technicians are well managed and have opportunities to undertake staff development activities.

Technicians provide good support.

Laboratory technicians are well qualified and provide an excellent service.

Teachers are supported in their work by a team of experienced technicians.

Quality and Standards in Further Education in England

Quotes from the Annual Reports of the Chief Inspector:

1996–1997 *Support staff are deployed efficiently but there is sometimes insufficient technical support for computing work.*

1997–1998 *Practical lessons are often more effective than theory sessions. Teachers and support staff are well qualified.*

1998–1999 *Practical lessons are usually taught more competently than theory lessons. Most teachers and technical support staff are appropriately qualified.*

1999–2000 *There is usually a good balance between theoretical and practical activities. Teachers and technical support staff work well together. Science students develop good practical, laboratory skills and follow health and safety requirements, though some do not understand the theoretical principles on which their work is based.*

Curriculum Area Survey Report: Sciences, March 1998

Quotes from the report:

Features of well-managed provision include sound strategic planning and effective arrangements for monitoring and evaluating the quality of course, strong leadership, clear objectives which are shared by teaching and support staff, roles and responsibilities which are clearly understood, good communications and productive team work.

Weaknesses commonly encountered include:
a lack of strategic planning;
inadequate management information to support the review and evaluation of courses;
low attendance at meetings leading to poor communications between teachers, support staff and students.

Sufficient help is available from teachers and technicians in most lessons.

Colleges have well-qualified and highly valued technical support staff teams who service information technology and science programmes. They provide technical support for practical activities and often order equipment and consumables, and carry out health and safety checks. Their role has changed in recent years and many now act as instructors or trainers. In large, multi-site colleges there is sometimes an imbalance in the technical support across sites. Where there are insufficient technicians to service equipment, faults are not repaired quickly enough or the equipment does not function efficiently.

Appendix 4: Joint Bristol scheme for school technicians' career & grading structure

The following is the joint guidance issued in September 2001 by Bristol City Council and the GMB, TGWU and UNISON unions regarding school technicians. Included with the advice was an outline of the progression route for school technicians (reproduced on the following page) along with generic job descriptions for each grade and employee specifications.

Background
The grading of technicians in schools had never been reviewed by either the former County of Avon nor Bristol City Council. Consequently the pay grading for this work group has not been considered for many years. Since Spring 2000, a group of technicians, a head of science, a headteacher and representatives from the Department and the Council's Pay and Benefits Team have been working together to design a set of jobs that accurately reflect the role of technicians in the 21st Century.

The work that has been undertaken is also part of a wider review to develop a set of jobs for all support staff posts in schools. Because of the lack of any up to date job descriptions etc, the first work group that was addressed were technicians. The gradings were determined by a job evaluation panel in April 2001.

The new jobs
There are 4 jobs in the 'job family'. They are:
1. Trainee Technician (Level 1)
2. Trainee School Technician (Level 2)
3. Qualified Technician
4. Team Leader Technician

The jobs are generic and represent the duties a technician in a school would normally undertake. It is important to recognise that the job descriptions etc can be modified locally to meet your own specific requirements. Where there are changes made at a school level, there should be consultation with staff and trade union representatives. Where you have posts that have already been evaluated under the Hay Job Evaluation Scheme since 1996, eg Resource Technician and Reprographics Technician, there is no requirement to use these new model job descriptions.

The new job and grading structure is a competency based model. It is designed so staff who demonstrate through performance management that they meet the required competencies can move through from Trainee Technician Level 1 to becoming a Qualified Technician, subject to effective performance. It is an expectation that staff should have an annual performance management meeting to review levels of experience and training to meet the requirements of the grading structure.

In respect of the Team Leader Technician post, it is a matter of local discretion to determine whether the post should be established. It is recommended that a team leader post is appropriate where there are three FTE or more technicians that need to be line managed.

Implementation of new grades
It is a matter for governing bodies to determine whether or not to adopt the new grading structure. However, it is recommended that the existing jobs undertaken by technicians are reviewed in the light of the new LEA structure and that staff are assimilated into the new structure according to their experience and qualifications. This should be undertaken in consultation with staff. It is open to the governing body to evaluate and develop jobs in line with specific school based requirements and the new job descriptions would represent a good starting point for this work.

Using competency grades
It is recommended that your school performance management policy is used as the basis for considering pay progression through the various trainee levels up to and including Technician.

Equal pay considerations
The new jobs have been evaluated and graded in accordance with the job evaluation scheme adopted by the City Council. Clearly, under the School Standards and Framework Act, it is a matter for governing bodies to determine grades in accordance with LEA pay scales. Governing bodies need to be mindful of equal pay issues if they decide not to implement the LEA recommendations and staff are undertaking duties at a lower grade where the LEA recommended grade is higher.

Qualification Allowances
Qualification Allowances no longer form part of the local grading structure for this work group. Therefore, there is no requirement for schools to pay the allowance to any staff appointed to this new grading structure.

Resource implications
It is a matter for individual schools to resource any grade increases arising from the new structure. It is recommended that this is discussed with work group at an early stage if grade changes are likely. The LEA will be reviewing the LMS Scheme this summer and it has been requested that this area of the Activity Led Resourcing Model is considered as part of the review.

Progression route for the Joint Bristol Scheme

Job title and grade	Essential criteria (technical)
Trainee Technician (Level 1) Hay B [Equivalent to APT&C scale points 10-13]	• Basic numeracy & literacy skills to NVQ level 1 equivalent level. • A proven aptitude for working within a technical support team. • Willingness to undertake further studies.
Trainee Technician (Level 2) Hay C [Equivalent to APT&C scale points 14-17]	• Either 2 full school years experience in a technician role or 1 year plus NVQ level 2 in a relevant technical subject. • An awareness of the role in terms of team working and service delivery. • Working knowledge of key responsibilities of a school technician.
Qualified Technician Hay E [Equivalent to APT&C scale points 22-25]	• Possess competence equivalent to NVQ 3 in a relevant technical subject plus at least 2 years proven experience in a school / nursery / Early Years Centre etc, or 4 years experience without the qualification, plus evidence of CPD. • A thorough knowledge of the relevant legislation, policies and procedures that have an impact upon the role and service. • Able to work autonomously in planning out workload in short term (up to a month).
Technician Team Leader Hay G [Equivalent to APT&C scale points 30-34] *(Can lead on to further career opportunities, eg FE/HE technician, teacher, Head of ICT unit, Technical Team Leader in other departments of the City Council etc)*	• Possess competence equivalent to NVQ 3 / BTEC in a relevant technical subject plus at least 4 years proven experience in a school / nursery / college / Early Years Centre etc, and evidence of CPD. • Able to organise the work of self and others, allocated resources, and assist in curriculum planning.

The generic job descriptions used in the Joint Bristol scheme are available from the Transport & General Workers' Union. For further information about the scheme please contact Denise Wiles on 01179 9389206.