

Technical Staff in Schools, Staffing and Conditions

Policy Statement

Compiled by
L. Geoff Gleadall
Jason Griffiths

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The Survey:

- 1) Which sector of the education system are you employed in
- 2) Which salary category does your position fall under in the above system?
(e.g. SSO1-2 in DET)
- 3) Do you receive any other allowances on top of your base salary for extra duties performed in your position? (such as a first aid allowance)
- 4) The following table is a summary of the typical working cycle in terms of the total science teaching load for your school.
- 5) What is the total number of technician hours per week employed by your school? (For this exercise, we have defined 1.0 FTE (full time) as 38 hours per week) [i.e. 2 F/T Lab techs = 2 x 38hrs = 76hrs]
- 7) If No, what number of technician hours would you consider adequate?
- 8) Please indicate if any of the following apply to you (please tick)
- 9) Please indicate who is responsible for writing/updating risk assessments in your school:
- 10) Are your science rooms/prep areas/chemical store widely dispersed or on more than one floor of a multi-story building? Yes/No
- 11) Are you required to provide induction for new staff/student teachers? Yes/No
- 12) Are you required to provide any of the following additional services outside the LTB-STAV laboratory technician role descriptions
- 13) Are you required to regularly design and/or trial new experiments? Yes/No
- 14) Are you required to attend and assist in science classes where practical activities are taking place? Yes/No
- 15) What is the maximum relevant qualification you have attained:
- 16) How many years experience do you have working in a school laboratory?
- 17) How many years experience do you have in any other relevant laboratory/industry?
- 19) What form(s) did the professional development take
- 20) Does your employer provide study leave or other support for your professional development? (please list)

Technical Staff in Schools, staffing and conditions

This policy statement represents the view of Laboratory Technicians' Branch of STAV of the minimum levels of staffing and conditions of employment required to provide for the efficient operation of laboratories in Victorian Schools.

The operation of laboratories in schools is far too big a task for teachers, however dedicated to do for themselves, the skills required are not normally possessed by most teachers and this is not a task that can be safely and efficiently carried out by an untrained person.

Recent years have seen an enormous increase in the administrative load imposed on technical staff in maintaining a safe working environment for themselves, for academic staff and for students.

Typically the decisions made on matters of technical staffing and conditions are made by people who have little or no expertise in laboratory operations and therefore little understanding of the problem. This policy will provide guidance for them in these matters and also for other stakeholders in this arena.

1) The current situation

- a) Historically staffing levels for technical staff in education have been inconsistent and usually inadequate with workloads varying from heavy to impossible. LTB-STAV has conducted a survey of our members to identify a number of issues (App C) and this shows clearly that staffing is in serious need of review. This is also consistent with the results found by CLEAPSS in the UK.
- b) Our survey indicates a service factor (the ratio of tech staff man-hours to number of science classes taught) of 0.47, and this is significantly lower than the optimum level which the CLEAPSS policy recommends as 0.6 and our own policy that will be stated later in this document.
- c) Anecdotal evidence points to situations in some schools of a single technician servicing school populations in excess of 1400 students and technician to student ratios of greater than 1:800 are not uncommon.
- d) The relative importance of the practical component of Science education also varies a great deal, the number of practical activities varying enormously between schools. It is logical to conclude that practical work is and should be an important part of the science curriculum. Presently the following issues often prevent the effective delivery of the services to provide this content.
 - i) Insufficient time for technical staff to prepare the materials
 - ii) Insufficient time for technical staff to implement a safe work environment for these activities to occur.
 - iii) Administrative loads in technical staff increase lead times to the point where academic staff have difficulty planning the practical component of their teaching.
 - iv) The responsibility for the acquisition and provision of physical resources for science is not well defined and this results in great difficulties in the provision of the equipment needed to effectively and safely deliver the practical part of a science program.

- e) Remuneration for Technical staff is inconsistent and arbitrary, the SSO structure used by DET and which is also followed in modified form by CEO schools is centred around the need to provide administrative staff and assumes a public service style of progression through on the job training, it does not cope well with the need for technical staff to have specific skills and training. Anecdotally we have seen instances where the “one size fits all” approach has been used to “promote” a clerical worker into a technical position with no provision for training.
- f) Typically technical staff are undervalued and their pay is not adequate for their responsibilities or expertise. It is scandalous that the most qualified and experienced of technical staff in education are paid less than the most junior teacher.
- g) There is no provision for advancement among technical staff and little chance to obtain those aspects of experience that the SSO and similar structures require. For example, since technical staff work largely alone or in very small numbers there is no scope for supervisory duties.
- h) There is no graduated progression of positions. All technical staff are seen as the same irrespective of experience or qualifications or of responsibilities.
- i) There are currently no mandatory qualifications for technical staff in schools for the major employers. Schools often do insist on specific qualifications but there is little consistency in this, no recognition of experience in most cases. The possession of qualifications does not result in any improvement in salary in most cases.
- j) Existing technical staff possess qualifications ranging from none to PhD level and many have extensive experience not only in educational laboratories but also in research and in industry (see Appendix B).
- k) Demographically, technical staff in schools fall largely into two categories, those that are new to the profession and those that are in their forties and fifties who have extensive experience. As this second group reach the end of their working lives and retire there is likely to be a crisis in staffing of laboratories in schools within the next 10 years.
- l) Since there is no chance of advancement in this profession for most technicians many leave the profession completely moving to research or industry to further their careers.

2) Policy recommendations

a) Staffing

Staffing of laboratories in Victorian Schools be set at a *minimum* service factor¹ of 0.55 with an additional 0.1 service factor loading for each of the following difficult circumstances;

- (i) Where laboratories are not on the ground floor or are on multiple levels and no lift is provided.
- (ii) Where the number of laboratories provided is inadequate for the school population resulting in occupancy rates regularly in excess of 85% or where construction or other works impinge on the working environment of the Science Department in the school

¹ A definition and explanation of Service Factor can be found in Appendix D

- (iii) Where science facilities are spread over more than one site or where labs are widely separated.
- (iv) Where there is no separate chemical store or where the chemical store is located away from the laboratories.
- (v) Where preparation laboratories do not include adequate facilities such as fume cupboards (not shared with teaching laboratories) or adequate storage.
- (v) Where a school has identified itself as having particular difficult circumstances such as a high non-English speaking population, or other problems that may be the basis of additional grant funding.

b) Career Structure

That a system of four levels of technician be instituted (see Appendix A) and that there should be a progression through these levels. This will ensure some prospect of advancement and encourage technicians to remain in education. These levels should be (see App A for detail);

- (i) Laboratory Assistant
(This is an entry level and should be seen as a training position only).
- (ii) Laboratory Technician.
- (iii) Senior Laboratory Technician.
- (iv) Laboratory Manager.

c) Qualifications

That the following qualifications or equivalent experience be considered normal for positions as Technical staff in schools;

- (i) Laboratory Assistant:
no formal qualification (this is a training position).
- (ii) Laboratory Technician:
passes in at least 4 VCE science subjects or a certificate IV in a relevant discipline or equivalent other training or experience.
- (iii) Senior Laboratory Technician:
a Diploma of Applied Science or equivalent or a Cert. IV with significant experience or extensive experience in a related field.
- (iv) Laboratory manager:
at least a Diploma of Applied Science and extensive relevant experience preferably in an educational environment.

d) Classification and salary range

That the previously mentioned levels of technical employment be seen as equivalent in terms of responsibility and remuneration to the (DET) classifications of: (See Appendix A for details).

Technical Assistant (trainee)	SSO 1-1
Technician	SSO 1-2 to SSO 2-3
Senior Technician	SSO 2-3 to SSO 2-5
Laboratory Manager	SSO 3-6

Appendix A

Job descriptions

The positions described here are based on the need to provide a structure for laboratory staff and as such only loosely fit in the generic job descriptors used by DET and the CEO.

As a guide the equivalent levels within the SSO structure used by DET are as follows

Technical Assistant (trainee)	SSO 1-1
Technician	SSO 1-2 to SSO 2-3
Senior Technician	SSO 2-3 to SSO 2-5
Laboratory Manager	SSO 3-6

1) Science Technical Assistant (trainee)

This is the entry level position for someone coming into the profession. It is intended to be a training position and therefore of a short term nature only. As soon as the training has been completed the trainee position should be replaced by a position at the Laboratory Technician level. This includes work placement students from tertiary institutions.

There are no requirements for qualifications at this level but it would be expected that someone in such a position would be undergoing training in a TAFE college or doing extensive P.D.

The occupant of a Technical Assistant position needs work under the supervision of a trained Technician, Senior Technician or Lab Manager. It would not be appropriate for such a person to be supervised by a teacher.

A Technical Assistant position should only be created for the purpose of training a person to continue in laboratory work and it would be expected that a training plan would be in place for the duration of such a position.

This is an entry level position which entails routine support tasks in the laboratory and does not require unsupervised work.

a) Typical duties of a science technical assistant (trainee):

- Under direction prepare solutions, stains and media for general use.
- Set out equipment and materials for classroom/department use.
- Clear classroom demonstrations/activities.
- Assist with care of flora/fauna.
- Assist science teaching staff and senior technical staff with enforcement of safety measures.
- Assist with stocktaking of equipment/materials.
- Assist with record keeping.
- Carry out simple maintenance of equipment and materials.
- Report damage to equipment and arrange repairs.
- Attend relevant professional development in accordance with a PD plan.

2) *Science Laboratory Technician*

This is the level of most Technicians in schools, some experience or qualifications are expected as is a degree of autonomy in carrying out duties and this position would be expected to be at a higher pay scale than that of the Technical Assistant.

Normally the occupant of this position would be expected to have completed at least 4 VCE Science units (or equivalent) or hold a completed Certificate IV in a relevant area, or have equivalent other training or experience.

This position does not require constant supervision and what supervision is required would come from a senior technician or laboratory manager. This should not be the position of a sole technician in a school. Since the sole technician has responsibilities for ordering and budgeting that are beyond the expectation for this level. Such a position would be a senior technician in a small school or a lab manager in a larger one.

a) Typical duties of a science laboratory technician:

i) Teacher Support

- Liaise with science teaching staff on their needs for practical work and maintain an efficient system for use and allocation of materials and equipment, setting a priority system where necessary.
- Advise science teaching staff on technical components of curriculum.
- Assist science teaching staff with demonstrations.
- Assist science teaching staff in instructing students on use/care of equipment during science experiments.
- Advise and assist science teaching staff in safety matters relating to the science laboratory.
- Prepare safety assessments in relation to Preparation tasks.
- Demonstrate laboratory techniques to science teaching staff/students.
- Assist with the use of computers and learning technologies within the department.

ii) Preparation & Maintenance

- Prepare solutions, stains and media for use in the laboratory.
- Maintain a safe chemical storage/handling/disposal system in accordance with current regulations.
- Assist with security of science laboratory and equipment.
- Maintain an inventory of equipment.
- Acquire relevant catalogues and price lists.
- Assist with labelling, storage, stocktaking and ordering of equipment and chemicals.
- Manufacture simple glassware/general equipment for laboratory use.
- Service and clean simple laboratory apparatus/equipment.
- Develop maintenance procedures for laboratory equipment.
- Attend appropriate professional development.

iii) Care

- Care for flora and fauna within the science department, in accordance with current handling and prevention of cruelty regulations.
- Collect and maintain living specimens (in accordance with regulations).
- Collect off campus scientific materials and field samples, utilising the school vehicle.

iv) Liaison

- Liaise with organisations and industries for purpose of acquiring equipment etc.
- Liaise with other schools to share resources.
- Be a member of a professional association relevant to the duties of the position.

v) Budget

- Assist with the science budget and petty cash system.

vi) Supervision

- Supervise the work of the technical assistant.
- Assist the senior technician or Laboratory Manager in the coordination of the professional development of the technical assistant(s).

3) *Science Senior Laboratory Technician*

This position involves the coordination of the work of the science department and requires significant expertise and qualifications/experience. The Senior Technician is expected to work autonomously and may be responsible for the supervision of trainees and less experienced technicians.

The Senior technician is the minimum employment level for a sole technician in any school.

The Senior Technician may be responsible for administering the Science Department budget.

Normally a Senior Technician would be expected to have a Diploma of Applied Science or equivalent or a cert. IV with significant experience or extensive relevant experience in a related field.

a) Typical duties of a science senior laboratory technician:

i) Teacher Support

- Liaise with science teaching staff on their needs for practical work and maintain an efficient system for use and allocation of materials and equipment, setting a priority system where necessary.
- Advise science teaching staff on technical components of curriculum.
- Assist science teaching staff with demonstrations, including acting as a demonstrator.

- Assist science teaching staff in instructing students on use/care of equipment during science experiments.
- Advise and assist science teaching staff in safety matters relating to the science laboratory.
- Prepare safety assessments for activities in the preparation area and, in conjunction with the teacher, in the teaching laboratory.
- Demonstrate laboratory techniques to science teaching staff/students.
- Assist with the use of computers and learning technologies within the department.
- Assist with the development of operational, OH&S and budgetary policy within the science department.

ii) Preparation & Maintenance

- Prepare solutions, stains and media for use in the laboratory.
- Maintain a safe chemical storage/handling/disposal system in accordance with current regulations.
- Assist with security of science laboratory and equipment.
- Maintain an inventory of equipment.
- Acquire relevant catalogues and price lists.
- Carry out and/or coordinate labelling, storage, stocktaking and ordering of equipment and chemicals.
- Manufacture simple glassware/general equipment for laboratory use.
- Service and clean simple laboratory apparatus/equipment.
- Develop maintenance procedures for laboratory equipment.

iii) Care

- Care for or coordinate the care of flora and fauna within the science department, in accordance with current handling and prevention of cruelty regulations.
- Collect and maintain living specimens (in accordance with regulations).
- Collect off campus scientific materials and field samples, utilising the school vehicle.

iv) Liaison

- Liaise with organisations and industries for purpose of acquiring equipment etc.
- Liaise with other schools to share resources.
- Be a member of a professional association relevant to the duties of the position

v) Budget

- Maintain the science budget in conjunction with the Lab Manager or Science coordinator and operate a petty cash system.

vi) Supervision

- Supervise the work of the technical assistant(s) and the technician(s).

- May assist in the provision of professional development for assistants and technicians in conjunction with the Lab Manager or Science coordinator, where required.

4) Science Laboratory Manager

Science laboratory managers are responsible for managing the efficient operation of the science laboratory area, and the implementation of strategies to assist the delivery of key school objectives. Science laboratory managers receive limited direction and instructions, and are expected to work autonomously.

A Laboratory manager would be expected to hold at least a Diploma of Applied Science or equivalent or extensive relevant experience in laboratory work (preferably in an educational setting).

Science laboratory managers may have responsibility for supervising and directing the work of technicians and assistants (if any are employed).

Science laboratory managers usually report directly to Principal or science coordinator on laboratory issues.

The Laboratory Manager may be a member of the management/leadership team.

a) Typical duties of a science laboratory manager:

i) Management

- Responsible for the efficient operation of the science laboratory area.
- Develop and implement measures for safe handling/storage/disposal of hazardous substances in accordance with relevant regulations.
- Develop and implement operational guidelines and practices in laboratory (e.g. safety policy for science).
- Obtain appropriate licences/permits for use of plant/animals/chemicals etc in the science laboratory.
- Co-ordinate use of all science materials around the school.
- Use department computers for record keeping and classroom experiments.
- Assist with the development of laboratory designs and plans for new or upgraded science facilities.
- Maintain asset register – annual stock-take.
- Conduct safety audits for the laboratories.
- Oversee the production of safety assessments for all activities within the Science Department.

ii) Finances

- Keep accurate records of purchases/incoming orders.
- Maintain a petty cash system.
- Develop budgetary proposals for laboratory.
- Be responsible for approved capital expenditure in the Science department for laboratory use in conjunction with the Science coordinator/head of department.
- Administer the Science Department budget.

iii) Personnel

- May perform a role in the selection of laboratory staff and provide induction for new laboratory staff.
- May be responsible for the supervision of other laboratory staff in the school.
- Coordinate the professional development of the other laboratory staff in the school.

iv) Teacher Support

- Trialling of experiments.
- Review, evaluate and modify laboratory practice - suggest alternatives/develop practical exercises.
- May assist in unit formulation or curriculum planning.
- Produce resource materials.

v) Equipment

- Create and maintain chemical and equipment databases.
- Perform calibration checks and operate specialist laboratory equipment and instruments.
- Oversee maintenance of equipment.
- Evaluate and select equipment, and make recommendations for purchase.

vi) Liaison

- Liaise with companies regarding excursions/use of materials.
- Liaise with other schools to share laboratory resources.
- Liaise with sales representatives.
- Be a member of a professional association relevant to the duties of the position.

Appendix B

Analysis of the 2006 LTB-STAV Laboratory Technician Survey

Available as a separate document:
"Technical Staff in Schools Policy Appendix B"

Appendix C

Survey raw data

(reserved)

Appendix D

Definition of Service Factor

Overview:

When analysing the data from questions 4-7 of the survey, the wide variety of conditions and loads made summarizing the raw data from these questions in isolation meaningless. With that in mind, a method of analysing the data was sought after, and the method developed by ASE² in the UK was decided on as our preferred method of data analysis.

The ASE method relies on two variables: The number of hours of science taught in a school and the number of technician hours employed by the school. The ratio of these two variables is defined as the service factor thus:

$$\text{Service Factor} = \text{Technician Hours} / \text{Hours of science taught in the school}$$

Analysis:

The information from the survey was broken into 2 sections for the purposes of analysis. The first section was to simply calculate the service factor for each survey. This was done by using the complete information from the table in Question 4 and calculating the total number of hours of science taught in the school, then comparing it to the number of technician hours available in the school.

Minimum = 0.16 (0)³, Maximum = 2.62, Average = 0.47

Section 2 was a comparison of the number of technician hours required to satisfy the needs of the school as depicted by the technicians in the school. This required a direct comparison between the schools that had a satisfactory level of technician hours according to their technicians with the projected hours required by the schools that indicated that more hours were required.

Minimum = 0.26, Maximum = 2.62, Average = 0.53

Taking this a step further, analysing just those schools that were unhappy with the number of technician hours currently and using their projected requirements, we determined:

Minimum = 0.27, Maximum = 2.38, Average = 0.55

The data from those same schools reflecting their current level of service is:

Minimum = 0.16 (0) *[2], Maximum = 1.44, Average = 0.38

² "Technical Support for School Science, ASE, 1990, ISBN 0863571425"

³ One school surveyed does not have a technician

Conclusion:

From the analysis presented, the average service factor is a clear indicator as to what level of service is required to meet the requirements of a school, independent of specific school requirements as defined by position descriptions. This has been independently reinforced anecdotally by time-in-motion studies of laboratory technicians in a variety of workplaces.

There also appears to be an obvious average threshold at which it becomes necessary to employ more staff, and an equally obvious point at which a position becomes untenable.

References

- LTB-STAV, 1999, LTB-STAV Science Laboratory Staff Employment Formula
- LTB-STAV, 2007 Staffing Survey and Report, (Appendices B and C)
- STAV, 2001, Science Laboratory Staff Policy Advice Statement
- CLEAPSS, 2002, Technicians and Their Jobs, L288