Display Screen Equipment (DSE) Guidance on Common Problems and Solutions

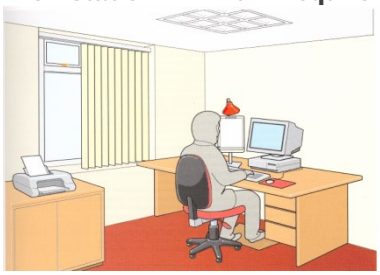
Display Screen Equipment Code of Practice

The DSE Code of Practice sets out the University's arrangements for managing work using display screen equipment including workstation assessments and eye and eye sight tests and spectacles for DSE work. This Guidance sheet is aimed at DSE users and DSE Assessors and gives brief details of the 'workstation minimum requirements', simple tips for safe use of DSE, common problems seen with workstations, and possible solutions that could be tried to make improvements. The advice in in line with the University's online workstation assessment system (WorkRite). All documents and relevant links are available on the University H&S web pages.

DSE users should carry out a 'self-assessment' of their DSE workstation, using the online training and assessment, and if wished this Guidance sheet, to identify problems and make simple changes to improve their workstation. If they have any unresolved problems, they should tell their line manager or Faculty/Directorate local DSE Assessor. A follow-up assessment will be carried out to identify how well the workstation meets the 'workstation minimum requirements', the personal and work needs of the user, and the DSE and other work they have to do at that workstation. Where the assessment identifies shortcomings in the DSE workstation or work, recommendations will be made on possible changes to remove or at least reduce the problems.

If the DSE user reports problems only with the workstation, the follow-up assessment will be carried out by the local DSE Assessor. If the user reports pain or discomfort associated with their DSE work or workstation they will be referred to the University's Health and Safety Unit for the assessment. They may also be referred to the University's Occupational Health and Wellbeing Service if necessary.

DSE Workstation Minimum Requirements - Seating and Posture for typical office tasks



- Adequate lighting
- Adequate contrast, no glare or distracting reflections
- Distracting noise minimised
- Leg room and clearances to allow postural changes
- Window covering if needed to minimise glare
- Software: appropriate to task, adapted to user, providing feedback on system status, no undisclosed monitoring
- Screen: stable image, adjustable, readable, glare/ reflection - free
- Keyboard: usable, adjustable, detachable, legible
- Work surface: with space for flexible arrangement of equipment and documents; glare-free
- Chair stable and adjustable
- Footrest if user needs one
- Seat back adjustable
- Good lumbar support
- Seat height adjustable
- No excess pressure on underside of thighs and backs of knees
- Foot support if needed
- Space for postural change, no obstacles under desk
- Forearms approximately horizontal
- Wrists not excessively bent (up, down or sideways)
- Screen height and angle to allow comfortable head position
- Space in front of keyboard to support hands/wrists during pauses in keying.

From HSE publication: - "L26 Work with display screen equipment - Guidance on Regulations"

Health

Aches and pains can occur for a number of reasons and medical conditions, hobbies and using a computer at home can all contribute to any discomfort that is being experienced at work. If possible, the workstation assessment should identify which if any problems appear to be related to work and all the contributory factors.

- Hobbies and sports can place additional strain on the body and prevent it getting the rest it needs, contributing to any discomfort that is being felt at work.
- A poorly-designed home workstation or a laptop that is used a lot may be a particular problem. Although improvements can be made to the work arrangements and workstation in the office to resolve or minimise problems there and prevent any contribution they may be making to discomfort, the user may need to make changes at home too to feel the full benefit.
- If, on the other hand, the home workstation is more comfortable than at work it will be helpful to identify the differences as these may indicate possible solutions at work.
- The line manager and Faculty Operating Officer (FOO)/Director of Directorate need to know about health and medical problems that may be adversely affected by the workstation or work, and arrange referral to the Health and Safety Unit and/or the Occupational Health and Wellbeing Service.

Health - Eyes and eyesight

Extensive research has found no evidence that DSE work causes any permanent damage to eyes, but it may make users with pre-existing vision defects more aware of them. DSE work does not itself cause the eye problem; the problem would have been there already but not causing any noticeable difficulty. Uncorrected vision defects and/or poor working conditions may give some users temporary visual fatigue or headaches and can make DSE work more tiring or stressful than it should be. Correcting defects and improving conditions can increase comfort, job satisfaction and performance.

- Ergonomic factors such as inadequate lighting, a poorly-adjusted screen or badly-positioned documents can make reading uncomfortable – see headings below.
- Eyesight commonly deteriorates with age and many people start to wear spectacles for reading and other close work.
- Bifocal and multifocal glasses users need to look through the appropriate part of the lens and therefore can find themselves adopting an awkward posture or making repeated adjustments to their head/neck position. They may need to pay particular attention to the position of the screen, papers and other items to prevent discomfort.
- DSE users are entitled to an eye and eyesight test – full details of the arrangements are given on the University H&S pages. The test should take account of the nature of the user's work, including the distance at which the screen is viewed, and decide whether or not the user has any defect of sight which requires correction when working with a display screen. The University must ensure users are provided with 'special' corrective appliances (glasses) where normal appliances cannot be used and results of the test show special provision to be necessary for display screen work. 'Normal' appliances are spectacles or contact lenses prescribed for any other purpose. In most working populations only a minority (usually less than 10%) will need special corrective appliances for display screen work, and this may include users who already wear glasses or contact lenses, or others who have uncorrected vision defects.

Rest and Work Breaks

In this context, breaks are anything that gives a change from screen, keyboard and mouse work. They include other work such as phone calls, filing or going to meetings and are not only coffee and lunch breaks. The frequency and length of the breaks will depend on the work being done and ideally it should be possible to choose when to take them. Short frequent breaks, for example five minutes after 50-60 minutes continuous screen work, are better than longer breaks at less frequent intervals. Breaks are also

more helpful if taken before tiredness and discomfort are felt. Tired eyes, stiffness, poor concentration and mistakes can all result from inadequate breaks from the screen.

- For most people their usual mixture of tasks provides natural breaks away from the screen, often far more than they think. If a mixture of tasks isn't available, the supervisor, Dean/Director or LSO should be consulted on possibilities for revised working.
- Drafting documents or amendments on paper helps to minimise the time spent working on screen. Breaking off and doing something else is also better than staring at the screen waiting for inspiration.
- It's natural to save intensive work for quiet times when there will be few interruptions, but it is easy to forget to take breaks if colleagues are not around and the phones are quiet. Tiredness and discomfort lead to mistakes and don't save time in the long run.
- Concentrating on the screen can reduce the blink rate leading to dry eyes. This can be a particular problem for contact lenses.
- 'Mini-breaks' of a few seconds from time to time can really help, e.g. the 20-20-20 guide (every 20 minutes take a 20 second break and focus your eyes on something at least 20 feet away (6m)), looking away from the screen or out of the window, taking the hands away from the keyboard and mouse, giving the fingers and hands a massage and shake, letting the arms hang down by the sides of the body, or standing up and stretching.

Lighting

Lighting at the workstation must be adequate for DSE and other work. It may be inadequate or uncomfortable because it is too dim or too bright and harsh, patchy, flickering, or gives shadows, glare or reflections. Unsatisfactory lighting could cause difficulty seeing the screen and other work clearly, perhaps giving sore eyes or headaches, or aches in the back or neck either from leaning to read or from sitting awkwardly to avoid glare and distracting reflections.

- Are the lights dull or flickering? Are the fittings dirty? Some fluorescent lights do flicker very slightly but most people cannot see this at all. Visible flickering or dullness can mean the lamp is about to fail. Ask Facilities Management to check and if necessary clean or replace.
- Can desks be moved slightly to take advantage of better lit areas of the room? Can light fittings be diffused, turned in situ or moved to reduce glare?
- Are blinds fitted and used to control glare and reflections from sunlight?
- Could more daylight be allowed in if desks were repositioned to avoid glare and reflections?
- Uplighters and desk lamps can be useful if room lighting cannot be improved and additional lighting is needed, but it is important to check that they do not introduce glare and adversely affect nearby workstations. Uplighters can help to reduce patchiness or harshness of overhead lighting.

Temperature and Humidity

Temperature and humidity at the workstation must be comfortable. It may be uncomfortable because it is too hot, too cold, very dry, stuffy, airless or draughty. Hot, stuffy rooms can lead to difficulties in concentrating and perhaps more frustration and mistakes. Cold draughty rooms can lead to general tenseness in the body, stiffness and aches and pains. Low humidity could cause problems of sore dry eyes.

- Do security devices prevent windows being opened far enough? Ask Facilities Management for keys if they are not available. Remember to lock the windows again at the end of the day.
- Are the radiators working properly? Are there draughts from windows and doors? Ask Facilities Management for help.
- Some office equipment produces heat and can make the air very dry. Is all the equipment needed? Does it all have to be in the room? Can equipment be turned off when not in use?

- Could the room be rearranged slightly? Can furniture be moved to improve window or radiator access? Can people be further away from hot equipment or draughty windows and doors that cannot be resolved? Some people tend to be naturally hotter or colder than their colleagues. Perhaps ideas could be discussed with colleagues and supervisors in a team meeting?

Noise

Noise levels from equipment, other people and external sources must not distract attention or disturb speech. Too much or distracting noise may lead to frustration and mistakes because it is difficult to concentrate or conversations cannot be heard clearly.

- If equipment is noisy try to identify the type of noise and when it occurs. Are loose panels or uneven feet causing a vibration? Could rubber pads underneath reduce the noise? Ask the IT HelpDesk or suppliers for servicing under maintenance agreements.
- Is all the equipment needed? Could it be turned off when not in use?
- Could shared printers or photocopiers be moved further from people to minimise disturbance? Could they go behind a screen? In a different room?
- Perhaps jobs needing close concentration could be done in quieter parts of the office?
- Are colleagues aware that they are causing disruption with their visits or chatting? Perhaps the line manager could speak with them or maybe it could be raised in a team meeting.

Space around the desk

There must be enough space at, under and around the workstation for DSE and other work and to change position from time to time. Too little or awkward space can lead to bumps and bruises when moving past furniture, falls over trailing leads and clutter, or aches and pains from working in uncomfortable positions.

- Can equipment and furniture be moved slightly to make a bit more space or give easier access or get rid of trailing leads?
- Can infrequently-used items be kept somewhere else? Can unwanted items be removed?
- Could shared equipment and furniture such as printers and filing cabinets be elsewhere in the room for easier access?
- Could some work such as envelope filing be done at a separate desk with space for boxes and storage of materials?
- Would a revised room layout give more space around desks? Perhaps ideas could be discussed with colleagues and supervisors at a team meeting?

Chair

The chair must be stable and allow freedom of movement (normally five-point base and castors) and a comfortable working position. It must have adjustable seat height and adjustable back height and angle. Rigid, faulty or poorly-adjusted chairs can lead to sitting too high or too low, in awkward positions, or with poor back support. This can cause aches and pains in the legs, back, shoulders and neck.

- Most chairs can be adjusted to suit most people. Are all the chair adjustments known and working properly? A colleague or local DSE assessor can help make the adjustments rather than leaning and straining to make them alone? Suppliers can provide information and may be able to make minor repairs. Contract Bulletins on the Procurement pages give contact details.
- Are other suitable chairs available and could be swapped? Broken chairs should be repaired or discarded, but rigid or less-adjustable chairs may be suitable for visitors.
- Sitting right back on the seat pad allows the back rest to give the best support. Is the back rest adjusted to support the lower back when sitting in a relaxed but not slouched position? Some chairs allow the seat back and/or the seat pad to be moved a little way. This can increase the seat surface slightly and give better support for long thighs. Larger chairs are available.

- Chair arms that are too high can mean shoulders are raised to keep the elbows clear.
- Chair arms can also bump against the desk and prevent sitting as close to the desk as possible. That can mean reaching forward unnecessarily or perching on the edge of the chair without proper back support. Can the chair arms be adjusted or removed?
- The chair height should allow sitting at the keyboard with relaxed shoulders, horizontal forearms and straight wrists. Sitting too low can lead to the shoulders being raised, perhaps without even realising, or to bent wrists when typing.
- A new sitting position may feel a little strange and need to be tried for a few days to be sure it is comfortable. Other adjustments may then be needed to the screen height or angle (perhaps room lighting becomes visible too), or a foot rest.

Footrest

Once the seat height is correctly adjusted the thighs should be properly supported by the seat pad and the feet should be either flat on the floor or on a suitable footrest. If the seat is too high the edge of the seat can put pressure on the backs of the legs and knees; or the feet may be placed on the castors and give an awkward sitting position and additional strain and aching in the lower back.

- Different styles and heights of footrest are available from office suppliers. Try using a small box or box file or borrowing a colleague's footrest to find the correct height needed before buying. Are suitable footrests available elsewhere in the work area?
- Using a footrest when it is not needed can mean the thighs are not fully supported by the seat pad and extra pressure is placed on the buttocks and base of the spine.

Desk

The desk must be large enough to allow flexible arrangement of equipment and documents and for them to be reached and seen easily. Account needs to be taken of requirements for both DSE and other work. The surface must not be shiny enough to give distracting reflections from lights and windows. There should be enough space underneath for the legs and to allow changes of position for different tasks. It should always be possible to sit directly in front of the work in hand. Frequent reaching and twisting, or leaning or turning slightly to one side when sitting can all cause extra muscle tension in the back, shoulders and neck and lead to aches, pains and headaches.

- It is best to sit directly in front of the work in hand, for example the keyboard and screen or the phone and notebook in use. Remove anything under the desk that prevents this or that restricts leg position.
- How are the computer, phone, documents and other items used? What are the best positions for them on the desk? The most frequently-used items should be closest at hand.
- If right-handed, having the phone to the left leaves the right hand free to write or use the keyboard/mouse.
- Can infrequently-used items go in a drawer or cupboard rather than be on the desk all the time? Can items be moved temporarily if extra space is needed for some work?
- Longer leads can give more flexibility for positioning of equipment but care is needed to prevent trailing leads that could cause trips and falls. Alternative or additional power and telecoms sockets may be possible. Facilities Managements and IT HelpDesk can advise.
- If leads go through a cable port in the desk that can help to keep them tidy but it can also waste desk space and reduce flexibility in positioning the computer and other items. Can a small gap be left between desks or between the desk and the wall to allow leads to go down there instead but without pinching?
- The base unit can go elsewhere on the desk, for example under filing trays. Base units and screens can overhang the back of the desk slightly so long as their base is fully supported and the leads will not be trapped or knocked by passers-by. This can give more space on the desk and a more comfortable position for the screen and keyboard.
- Propping books and papers when reading for long periods reduces the angle of the neck and can help to reduce strain.

Document Holder

A document holder helps to keep loose papers or documents in a comfortable position for easy reading and annotating when working on the screen. A holder can be useful for people who have to look repeatedly from the screen to a document and back again, and for anyone who finds difficulty refocusing. The document holder must be stable and positioned to minimise head and eye movements. A poorly-positioned document holder or leaning to look at papers on the desk can give awkward back and neck postures or difficulties focusing. Back and neck pain, tired eyes and headaches could result.

- Traditional upright document holders should be placed next to the screen and at a similar height, angle and distance. Touch typists may only need to look at the screen occasionally and could have the document holder directly in front of them and the screen slightly to one side when copy typing.
- Ideally the font size on the screen is the same as on the papers so that the eyes can focus easily. Try moving the papers nearer or further away or adjusting the screen font. Photo-copying the papers to produce a different size font may be an alternative.
- People who have to look at the keyboard to type may find it better to place documents on a slope between the keyboard and screen. This is also a comfortable position for reading and annotating papers and eliminates leaning or twisting to the side to look at papers on the desk. An empty lever arch file or clipboard may be suitable for occasional use. Proper document slopes are available from office suppliers if this is a routine part of the work.
- Can different styles of document holder be borrowed from colleagues or via the local DSE assessor for a trial before purchasing? Are there any spare holders in the work area?

Display Screen

The height and angle of the display screen must allow a comfortable head position. The screen may be on the desk or raised but must be adjustable and free from glare and reflections from lights and windows. It must have a clear stable image that does not flicker, and also have adjustable brightness and contrast controls. Poor quality characters and images, or glare and reflections can lead to difficulties reading the screen and may cause tired eyes and headaches, or back and neck pain from awkward postures.

- Regular users of computers at work are eligible to visit their optician for eye and eyesight tests. The eye and eyesight test form should be obtained beforehand. It can be downloaded from the H&S pages. Users can claim reimbursement towards the cost of the eye test, and also towards the cost of glasses prescribed specifically for workstation use. If glasses are for general wear and not specifically for DSE work there is no entitlement towards their cost.
- If possible, the DSE Assessor and user should discuss problems and review the workstation assessment before the optician is visited. The optician will need to know about the workstation and any issues that have been eliminated or recent changes that are being tried. This will help them to decide on any recommendations.
- Normally the screen should be directly ahead and be behind the keyboard. Touch typists may prefer to have their document holder behind the keyboard when copy typing and have the screen slightly to one side.
- Sitting facing a window or with the back to the window can both give particular problems with glare and reflections and make screen work particularly uncomfortable. Ideally the screen should be at a right angle to windows and fixed wall or equipment lighting and as far away from them as possible to avoid or minimise reflections and glare. Try to position the desk and screen to achieve this if possible.
- Use window blinds and readjust them during the day to minimise any remaining reflections and glare. Screen filters do not remove the problem and can even introduce problems by reducing the screen clarity even more.
- Reflections and glare can also be experienced with poorly-positioned portable uplighters and desk lamps. Adjusting the position of the screen or lights, even very slightly, can eliminate the problem. Improving desk positions or room lighting can remove the need for those additional lights.

- Screen height depends on the need to look at the keyboard when typing and the kind of work being done. The ideal relaxed position for the neck and eyes is looking down slightly. Touch typists may be comfortable looking down just a little with the screen on top of the base unit or a raised stand, with the top of the screen no higher than eye level. Poor typists, who need to look at both the keyboard and screen frequently, may be more comfortable with their screen on the desk or on a low stand as this will reduce the head and neck movements looking between the two. Many screens also have integral height adjustment.
- It is generally recommended that the screen is about arm's length away, but it may be helpful to move it a little nearer or further away for some work or if the eyes are tired.
- For wearers of bifocal or multifocal glasses the screen height and distance will also be determined by the need to look through the appropriate part of the lens.
- The screen brightness and contrast settings should be adjusted to suit the lighting in the room and individual preferences, and may need to be altered during the day as lighting levels change.
- Angling the screen down slightly can reduce the visibility of overhead lights. This may be especially important if the screen is on the desk rather than on a base unit or stand.
- Dirty screens can also reduce the clarity of screen characters, so routine wiping of the screen is recommended.
- Where tasks require fine attention to small details or swapping between items on screen, a larger screen size may be needed for ease of working. Two screens are not generally recommended and if used, should preferably be of the same type and set at the same height.
- Increasing the page or font size can make it much easier to read documents on screen. Remember to close unwanted columns in spreadsheets
- Changing to large icons can make them much easier to locate with the mouse.
- Some older screens do flicker very slightly although most people cannot see this at all. The IT HelpDesk can help with checking the settings which could affect the screen image, such as resolution and refresh rate. If necessary, screens can be replaced.

Keyboard, Mouse or Tracker Device

The keyboard should be separate from the screen, be adjustable and have clearly legible characters. There must be enough space between the keyboard and the edge of the desk to allow the hands to be supported when not typing. Typing or using the mouse with the arms reaching forward or out to the side places additional strain on the neck and shoulders and can cause discomfort. Forearms should be approximately horizontal and wrists relaxed but straight. Typing or using the mouse with the wrists bent up, down or flexed to one side can constrict the nerves and blood flow in the joints and may cause discomfort. Resting the hand or wrists on the desk when typing can bend the wrists up, put extra pressure on the contact points and cause discomfort.

- The keyboard should be straight ahead when typing. If only the number pad is in use, the keyboard should be moved to bring that portion directly ahead. Separate number pads may be helpful as they can be placed close to the body. Short keyboards with no number pad are available.
- The keyboard should be close enough to avoid reaching forward to type, but there should be enough space to rest the hands on the desk when not keying (the keyboard can be pushed back slightly to achieve this).
- Most people have their hands and wrists in mid-air when typing. Keyboard wrist supports are helpful only if the wrists are normally rested on the desk when typing and particularly if thick raised keyboards are used. They then help to keep the wrist in a straight position and provide cushioning.
- Normally the mouse should be close to the keyboard to avoid the arm reaching forward or being held out to the side. If the mouse is being used exclusively, it can be moved in front of the body and the keyboard moved to one side. An upright mouse may be preferred.
- Mouse mats provide cushioning for the heel of the hand but need to be large enough for the task, smooth and free from sharp or damaged edges. Gel-type wrist supports

can also help to keep the wrist straight when using the mouse. Is there a spare mouse mat around to try?

- The mouse speed and double-click sensitivity should be adjusted (under Settings/Control Panel) to suit individual preferences. Left-handed users may prefer to reverse the operation of the mouse buttons and may need to have a mouse shaped for left-handed use.
- Remember that keyboard shortcuts exist for most functions such as opening and editing documents and navigating around the screen. They are a good alternative to using the mouse and help give that hand a rest. Identify the most common mouse tasks and try to use the keyboard shortcuts for those in routine working. Information is given on the H&S pages.
- Periodic cleaning of the underside of the mouse helps maintain easy movement and prevent juddering.
- Using an ambidextrous mouse or using a standard mouse with the other hand gives the usual hand a rest.

Software

Software must be appropriate for the task and be easy to use with appropriate training. It should allow adaptations to individual abilities and preferences, and give feedback and error messages. Using software that is unsuitable for the work or not fully understood can lead to frustration, mistakes and time wasted on over-long processes or corrections.

- Formal training courses, software 'Help' pages and information on the Internet give good introductions to software but may be of limited help on details.
- The IT HelpDesk can help with some queries but may not be familiar with individual work needs.
- Members of a team often know different tips and shortcuts for easy working with the software. There may be a team 'expert' who could do individual or team briefings, with their manager's permission.
- It may be possible to compile an information sheet drawing all the hints and tips together, perhaps in a team meeting. The sheet could then be given to everyone and included in inductions for new staff. It may also be helpful for any other groups using the same software.

Laptop

Portable computers are designed for portability, but carrying them and their accessories (and your paperwork) can still be a problem. They may also be a target for thieves. Their small size can make it very difficult to adopt comfortable and healthy postures when using portables, so they should not be used for prolonged periods. Back, neck and shoulder pain can easily be the result.

Selecting a portable computer

- Choose as light a portable computer (and accessories) as possible (eg 3 kg or less).
- Use a light-weight case with padded shoulder straps, or consider a small suitcase on wheels which would be useful to carry papers too. A case without computer manufacturer's markings makes it less obvious that you are carrying a valuable item.
- Facilities for use as a 'docking station' and fitting an external mouse/numeric keypad can help achieve more comfortable postures.
- Use long-life batteries, and follow the instructions for proper charging. Consider keeping extra transformer/cable sets where you normally use the portable to avoid carrying them.
- Select as large and clear a screen as possible (eg 14" diagonal or more), ideally detachable or height adjustable.
- Choose a keyboard with as large keys as possible. A flat area between the keys and the front edge of the portable can give a better wrist position.
- Friction pads underneath can help prevent the portable sliding in use.
- Match memory, speed and add-ons to the work needs to minimise frustration.

Using your portable safely

- Always use a full size PC and properly designed workstation whenever you can, or link your portable to a full-size screen, separate keyboard and mouse.
- Small lightweight stands can be used to raise the portable's screen to a more comfortable viewing height. A separate keyboard must then be used as the keys will be at too steep an angle for comfort.
- Use a standard height upright (ideally adjustable) chair and work surface, if possible.
- Sit directly in front of the portable, and sit right back in the chair so that the back rest can support you. A pillow or cushion may help if the chair cannot be adjusted.
- If you cannot raise the portable on a stand to improve the height, having the portable away from you a little may be more comfortable for your neck, as you will not have to look down so far.
- Try to position the screen at right angles to windows and as far from them as possible. Angle the screen so that it is roughly perpendicular to your line of sight. These help avoid reflections/glare.
- Try to keep any reference documents close to the keyboard/screen to avoid leaning to read. Use a document holder, adjusted to the same height, angle and distance as your screen if possible.
- Keep shoulders relaxed and forearms/wrists horizontal when keying, to minimise discomfort.
- Remember to use keyboard shortcuts as much as possible. Keep your fingers relaxed and your hand flat when using the tracker device. If using a mouse, keep it close and move it with arm rather than wrist movements.
- Clean the screen and adjust the screen brightness to ensure maximum legibility.
- It is particularly important to take frequent breaks from the screen and also to change your posture from time to time.

If you must use a portable in the car, sit in the passenger seat with the seat pushed right back for maximum space. Resting the portable flat on a briefcase helps to achieve a comfortable height. If you must use a portable on planes or trains, try to book a seat with space in front of it.