

# TechnoTalk

## The TASC Newsletter



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### Editorial

Welcome to the first edition of TechnoTalk for 2009. We hope that you have had a restful Christmas and New Year and are ready for another year of assistive technology tips and updates from the TASC team.

Debbie McKie, seating consultant, is continuing to look at seating components and this month she explores various materials used to make cushions. This is a useful resource for anyone involved in prescribing or manufacturing seating systems as it covers some of the questions that are asked by our clients and their families.

TASC also welcomes a new occupational therapist to the technology team. Justin Ware joined us in December and brings with him a wealth of experience from working in Australia and the UK. He introduces himself to you this month.

Justin has also been busy reviewing Mini Laptops which have become increasingly more available and popular in the past 12 months.

There are some great conferences coming up this year:

International Cerebral Palsy Conference 18-21st February 2009, see <http://www.cp2009.com.au>

AGOSCI 2009 COMMUNICATION Feel the Power, 7-9th May 2009, see <http://www.agosci.org.au/>

Happy reading!

Jo Ford

## News...

### Communication Software for Macs!



### Proloquo™ 2.0

**Proloquo™ 2.0** can be used to create a personalized Augmentative and Alternative Communication (AAC) system.

With this program you can:

- Type text into Proloquo and let it speak (parts of) that text.
- Use drag and drop (or copy and paste) to create sets of category based phrase banks, for commonly used words and phrases.
- Customise speech panels which have coloured and re-sized buttons. Text and/or images can be created with LayoutKitchen using over 8000 re-sizable, industry-standard Picture Communication Symbols™ from Mayer-Johnson (purchased separately).

System Requirements:

- Proloquo requires Mac OS X 10.4 or higher, but Mac OS X 10.5 (Leopard) is recommended.
- Requires a minimal screen resolution of 800x600 pixels.

Website: <http://www.orin.com/access/proloquo/index.htm>

Free demo: <http://www.assistiveware.com/proloquo.php>

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# Main Story:

## A Look at Mini Laptops

by Justin Ware



In the past 12 months, a large selection of compact and affordable mini laptops has come on to the market, offering lightweight and portable computing, often with impressive battery life. These mini laptops have a range of pros and cons for all users when compared to standard laptops and these pros and cons will be discussed briefly in this article. The main purpose of this article, however, is to discuss the accessibility of the mini laptops for people with additional computer access needs.

The large (and growing) range of mini laptops now on the market offers a compact laptop for a fraction of the cost of most other new computers. The original affordable mini laptop was probably the Eee PC by ASUS. Also available are the

Acer Aspire One; the MSI Wind; the Dell Inspiron Mini 9; the HP Mini 1000; the NEC Versa; and the Toshiba NB100. Please note that this is only a sample of the range and not a list of all the competitors in this market. All mini laptops come with internal wireless capability and are thus ready for internet access if users have a wireless internet connection already set up.

It is well beyond the scope of this article to compare each mini laptop, so the general features of mini laptops will be discussed. For more information and comparisons of each brand and model, individuals should do their own research online, in computer magazines and by talking to computer experts.


The first thing that most people notice when looking at this range of laptops is the small price tag. This makes these computers incredibly affordable as they range from as little as \$350 for a very basic model to about \$800 for something with more software and higher hardware specification.

It should be noted that this small price is possible because a lot of features normally available on a computer have been sacrificed. For example, none of the models that we looked at were available with an internal CD or DVD drive or any disk drive for that matter. This means that if you want to install any software, you need to either download it from the internet or purchase an external CD / DVD drive at considerable extra cost. This is especially important to remember for any users with additional needs who want adaptive or assistive software.

A number of independent reviews have also pointed out that these mini laptops vary drastically in their build quality. Some computer manufacturing companies have clearly used cheaper materials in order to keep costs down. It is recommended that if you are going to buy a mini-laptop that you shop around for one that is going to stand up to the everyday wear and tear that an ultra portable computer is likely to experience.



The feature that varies the most with the price range in these mini laptops is the amount of hard drive storage space. The base models can come with as little as 2GB of storage, which is barely enough to store the operating system and the basic software. This increases to 4GB, 8GB, 12GB, all the way through to 160GB as prices increase. The smaller hard disk drive variants are much more affordable, but won't be able to store much in the way of extra programs for accessibility or any digital media such as photos, music or video.



Also varying according to cost is the battery life of the mini laptops. Base models tend to last a little longer than a standard laptop at 2.5 - 3 hours. Interestingly, however, some mini laptops are available with extra long-life batteries with reported normal interface times of up to 9 hours! Longer battery life usually means more weight as batteries tend to be heavy.

Most mini-PCs are now available with Microsoft XP installed; however, the base models come with an operating system called Linux. The interface of Linux will be unfamiliar to most PC users and will take a while to get used to. Also, while ongoing development and improvement is taking place, Linux still lacks some of the accessibility features that come standard with XP. Furthermore, some software that is often used by computer users with additional needs may be incompatible with Linux.

A glaringly obvious feature of the mini laptops that must be discussed is their size. Generally they vary a little, but evidently, most mini laptops are VERY compact and this has a range of pros and cons attached.

Most mini laptops weigh around 1kg, which is about half the weight of a standard laptop. The small screens vary from a tiny 7 inches (diagonal corner to corner) to about 10 inches. This means that the screen will be unobtrusive to look over or around, but many users report that it just feels too small and also cannot display some web pages correctly as they simply do not fit into such a small space.



Obviously, a small screen presents significant problems for people with vision impairment, however some “zoom browsing” software is available (pre-installed on some mini laptops) that means that only a small portion of the desktop is actually shown on the screen at a time. This allows for magnification of part of the screen at a time without squashing everything in to a tiny space.

The compact keyboard found on all mini laptops can be an asset or a hindrance for users with a disability depending on their computer access needs. Compact keyboards are often recommended for people who fatigue quickly, those who have small hands, or those who type with one hand. Most individuals, however, will find the ultra-compact keyboards a little challenging due to the small size of the keys and the lack of space between keys. (Many manufacturers actually recommend the use of an external keyboard if the mini laptop is to be used for any extended period of time).

Computer users with fine motor issues or movement disorders may find such a compact keyboard unusable.

Finally, the computer processing speed needs to be considered: all mini laptops run on efficient processors that are considerably less powerful than most modern laptops. This is not a problem for basic word processing and internet browsing, but any programs that require more intense processing, such as video editing, sound editing or playing games with complex graphics may be a problem for the mini laptop.

## Making the mini laptop accessible




In spite of the problems associated with mini laptops for users with additional needs, there will be many cases where a mini laptop may be useful. Although the mini laptops are too small to have extra hardware installed internally, a range of external devices can make them more accessible.

A Regular USB keyboard and mouse can be plugged into all mini laptops. This will solve some access issues for many users. Similarly, trackballs, adapted keyboards and adapted mouse devices can also be plugged into the USB ports just like on any other computer. Please note however that many mini laptops only have two or three USB ports so the number of devices able to be easily plugged in can be limited by this. Other external devices that

might need to be plugged in through USB might include printers, switch interfaces, external CD ROM drives, etc. USB hubs are available if more slots are needed.

Some (but not all) mini laptops have a video port, which means that a computer monitor can be plugged in. This will mean that users who have vision impairments or simply want a bigger screen can plug their mini-laptop in and use their computer while looking at a normal screen (see picture above).



The addition of all of these external devices (particularly external keyboards and screens) mean that the ultra-portable mini laptop suddenly isn't portable any more as all the extra equipment will need to travel with it. Plugging in and unplugging any devices may also be difficult for anyone with additional access needs and this could impede a person's ability to access their computer independently.

Keyguards can be custom made for all mini laptops, however this involves sending the mini laptop away to be measured. The implementation of a keyguard means that the laptop screen will be unable to be closed whilst the keyguard is in place. This may also affect the ability of the laptop to be used independently. For more information on custom keyguards, contact TASC.



As mentioned earlier, mini laptops generally come with either the Linux or XP operating System. These two systems vary considerably in their in-built accessibility options. The XP mini laptops come with all the standard software features of XP that are available on any other computer. Linux, however has a number of issues related to accessibility.

Users with additional needs who are interested in the accessibility of the Linux operating system can look at the standard features available at <http://tldp.org/HOWTO/Accessibility-HOWTO/>

Users who are interested in the developments that are happening in Linux with regard to assistive technology should look at <http://projects.gnome.org/accessibility/>

## Summary

The whole range of mini laptops that are now available offers a selection of affordable and portable options to people shopping for a computer. As with all things, there are advantages and disadvantages of the mini laptops, especially for people with additional computer access needs. It is strongly recommended that you discuss your personal needs with an Occupational Therapist before investing in a mini laptop to make sure that it meets all of your needs and will be compatible with your access requirements.

## References

- Ability Net UK Website [www.abilitynet.org.uk](http://www.abilitynet.org.uk)
- APC Magazine Online <http://apcmag.com>
- GNOME Accessibility Website <http://projects.gnome.org/accessibility/>
- Linux Accessibility How To Guide <http://tldp.org/HOWTO/Accessibility-HOWTO/>
- Dell Australia [www.dell.com.au](http://www.dell.com.au)
- ASUS Australia [www.asus.com.au](http://www.asus.com.au)
- HP Australia [www.hp.com.au](http://www.hp.com.au)
- Toshiba Australia [www.toshiba.com.au](http://www.toshiba.com.au)

## Staff Profile

Hi All, I'm Justin Ware and I have just started as an Occupational Therapist at TASC. I Graduated as an OT in 2004 and worked for the Department of Ageing, Disability and Home Care (DADHC) in the inner west of Sydney for a couple of years providing Occupational Therapy to children with moderate to profound intellectual disabilities. When I left DADHC, I headed for the UK, where I worked in a whole range of different areas, such as paediatrics, seating, environmental modifications, Age Care Rehabilitation and Neuro Rehab. I returned to Australia and worked at DADHC again briefly before starting with TASC in December 2008.



I have always had a strong interest in technology and what it can (and can't) do. I am excited about working at TASC and am looking forward to helping you get the best out of your technology!

# Seating Components

by Debbie McKie

Seating can be made up of a single material or a combination of materials depending on the complexity of the client. But how do we choose one material over another? This article looks at different options available to clients and their possible applications, however it is important that a prescribing therapist be involved in the decision making process about which option to choose due to the diverse needs of clients.

## Foam

Foam is classified as a substance formed by trapping gas bubbles in a liquid or solid. It is graded by its density, which is determined by the weight of the foam. High density foam is heavier than its lower density counterparts, as it contains a higher proportion of material and less air within its matrices; it is more durable and able to maintain its shape for longer.

Different styles of foam are available including flat, egg crate, pin hole or gridded. It can be either open or closed cell.

**Open Cell** foam has air trapped within it; however air can escape to the external environment as pressure is applied. The compression provokes a rebounding force causing the foam to conform around the body as it attempts to re expand. It is reasonably inexpensive and has the ability to contour and be cut into various shapes for an individual; however it is permeable to liquids and bodily fluids.

An example of open cell foam is memory foam which compresses on contact but springs back immediately after pressure is removed.

You find open celled foam in cushions, backrests, headrests and contoured footplates.

**Closed cell** foam is created when gas bubbles remain trapped within the foam and cannot migrate to the external environment. It is generally rigid, water-resistant, has low permeability, poor vibration absorption and poor pressure relieving properties. Its rigid nature makes it difficult to mould post production.

Types of closed cell foam include:

- Polyurethane - often used to create a contoured base for pressure relief materials, and may be used in a combination with other foam densities
- EVA foam - a thin layer over the cushion base for waterproofing

These are used for components such as commercial headrests and thoracic supports.

Foams are suitable for people with a low-medium risk of pressure ulcers (dependant on foam choice).

## Visco Elastic Fluid, e.g. Gel, Silicone and Floam

This group of cushions are composed of viscoelastic fluid or gel enclosed in a plastic or latex pouch and are particularly good for reducing the risk of pressure injuries associated with shearing<sup>1</sup>. The pressure relief properties work in two ways to decrease the shearing forces:

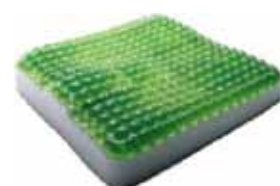
- Viscosity resists shear flow, improving pressure relief
- Elasticity allows stretch of the liquid which then returns to original state post stretch which reduces shearing forces



Combination of foams in a seating system



Closed cell foam thoracic



Jay-J-Gel Cushion



It also allows movement and conforms to the shape of the pelvis/body distributing pressure evenly.

Temperature will affect the viscosity of the fluid, for example, decreasing temperatures will increase the viscosity of the fluid which then causes increased firmness. The changing viscosity of the fluid also affects the movement within the pouch. If the fluid has a higher viscosity it will provide a more stable surface to sit upon but the shock absorbing abilities of the cushion will be reduced.

A stiff foam base underneath the fluid/gel sheet can be used to create contour.

### **Floam**, e.g. "Cloud" Cushions by Otto Bock

Floam is a lightweight gel (approximately 1/3 of the weight of generic gel) and moves like a fluid. It does not return to its original shape after being compressed, which reduces friction against the skin on movement but some products require regular kneading.



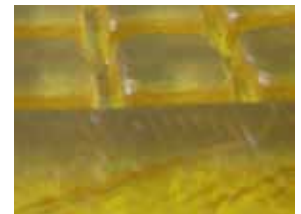
"Cloud" Cushion

It is comprised of three different types that can be combined to create an individualised cushion:

- **Blue:** Lowest amount of foam used in areas such as ischial tuberosity
- **Black:** Medium amount of foam used as main surface contact region over buttock
- **Red:** Highest amount of foam to assist with contouring and providing contact surface

### **Polymer Gel**, e.g. Jay-J-Gel cushion (see picture under "Visco Elastic Fluid" heading)

A semi-solid gel product which provides pressure relief that contours evenly around the body and reduces shearing. Due to its components it is quite heavy and can feel "cold" when first transferring onto the cushion, but it is very low maintenance and inexpensive. It may also absorb some vibration when used in a wheelchair in motion. It can also be purchased separately and fitted on top of a cushion.



Polymer Gel Sheet

### **Fluid**, e.g. Invacare Flo-tech Cushions

Fluid cushions are comprised of a high density foam base for contouring and a top layer of fluid placed strategically in areas at risk of high pressure. It allows the bony prominences to immerse within the fluid, but there is a risk of bottoming out and requires regular kneading. It is heavy and can feel cold, which can be a benefit in warmer climates.

Visco elastic cushions are suitable for clients with a low-medium risk of pressure areas. Some are suitable for high-very high risk clients, especially if using a combination of materials.

### **Air Floatation**, e.g. Roho Cushions

An air-filled pouch allows pressure to be distributed equally over the skin surface as the internal pressure equalises, therefore reducing tissue deformation. Using multiple compartments prevents "bottoming out" by limiting the displacement of the air away from areas providing most pressure.

Some cushions allow air movement between the cells but seal them into compartments to improve the stability of the cushion.

These provide good pressure relief with adjustable firmness and are easy to keep clean. Due to the nature of the cushions, an emergency repair kit needs to be carried, as it is at risk of leaking. It is vital that they are checked regularly to detect



Roho Cushion



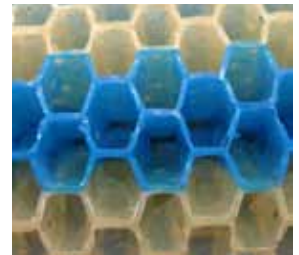
any unknown leaks and that the prescribing therapist/carer monitors the pressure to ensure it is correct. Thorough training is required for the person/people checking the pressure levels, as it is vital to maintain the appropriate amount of pressure in the cushion.

There are new advances in cushion technology with self regulation pressure alarms being used to alert the user when distance between the lowest point of the body to the solid surface underneath falls below the vertical distance set by the therapist, e.g. MERLIN Proximity Sensor (ROHO Group).

Air floatation cushions are suitable for clients with a medium-very high risk of pressure areas.

### **Honeycomb**, e.g. Stimulite Cushions or Supracor

Polymers (a plastic material) are moulded into a sheet of honey comb which provides pressure relief similar to a group of springs. It allows airflow throughout the honeycomb via small holes which improve heat and moisture dispersion, while the flexible movement of the honeycomb structure reduces shearing. Combined, it assists in the prevention of pressure ulcers.



Roho Cushion

Honeycomb can be quite expensive, however it is very durable, easy to clean and lightweight. It can be positioned in a breathable cover, which is removable and washable, over a contoured foam seating system to assist with temperature regulation. The ability of these cushions to breathe can also reduce sweating. This also assists in the reduction of pressure ulcer risk.

Honeycomb cushions are suitable for clients with a medium/high risk of pressure areas.

#### *References:*

1. Shearing is the friction caused by the movement of skin in the opposite direction to the underlying bones and muscles and can contribute to pressure area development.

Pictures cited from:

#### **TASC Equipment Services**

- <http://www.ilcaustralia.org>
- <http://www.invacare.com/>
- <http://www.medifixservices.ie>
- <http://www.ottobock.com.au/>



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