NO-COST TRICKS AND TWEAKS FOR PC ACCESS BY SENIORS WITH LOW VISION

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INTRODUCTION

Aging is often associated with isolation, loneliness, reduced mobility, and memory loss. Computers have the potential to mitigate these problems through their ability to network; to access, record and store information; and to allow for image manipulation and organization. However, older people often are intimidated by computers and are reluctant to use them. Vision loss can make them still more reticent, or convince them that computer use is not even possible. They may also reject the use of "low vision" software and large monitors due to expense, the inability to install software, lack of space for a large monitor, or feeling that using "special" technology stigmatizes them. There are, however, many cost-free ways of enhancing the text and images on computers screens via MS Windows, MS Office, Web browsers, and mice.

AGING BRINGS LOSSES; COMPUTERS MAY HELP

Bette Davis was correct when she said that "Aging isn't for sissies." Aging is a time of loss: loss of friends and relatives, of mobility, of manual dexterity, of memory. These can result in loneliness and dependence which in turn can cause depression along with its adverse effects on health [1]. Memory loss that results in forgetting to take medications also can have disastrous health consequences.

Computers may help ameliorate these losses. The American Psychological Association says that by networking people and allowing them to communicate, computers can relieve depression [2]. They also can provide for online shopping and banking, and be used to schedule and remind, to fill leisure time, etc. During the retirement years one finally can write one's memoirs, write poetry, or create new recipes; organize those many digital photos; and play computer games.

OLDER PEOPLE, COMPUTERS, AND VISION LOSS

In general older people are intimidated by computers. They recognize that computers are very different from anything with which they are familiar, and realize that learning new things is more difficult than it used to be. They are afraid of failing and of being embarrassed by their failure.

Fig. 1 is based on analysis of the 2008 American Community Survey PUMS data by William Erickson, Employment and Disability Institute, Cornell University, November 2, 2010. It shows how the prevalence of visual impairment increases dramatically with age [3]. Add to this the fact that the size of our older population is swelling, and the result is a large increase in older people with reduced vision. Difficulty seeing what is on the screen would seem to be an ideal excuse not to learn to use computers. But "of all people who are visually impaired, 80 percent have some usable vision" [4], so it behooves us to try to tap usable vision in the elderly so they can benefit from computer use. However, suggesting that help might be obtained from software designed specifically for people with low vision results in concerns such as:

- I do not know where to find it
- I cannot afford it
- I cannot pay for online purchases
- I do not know how to install software
- I cannot see to install it
- I will not be able to learn it
- I will find it too difficult to use
- I do not want to be restricted to one computer or one location

- I do not want to use anything designed for "disabled" people
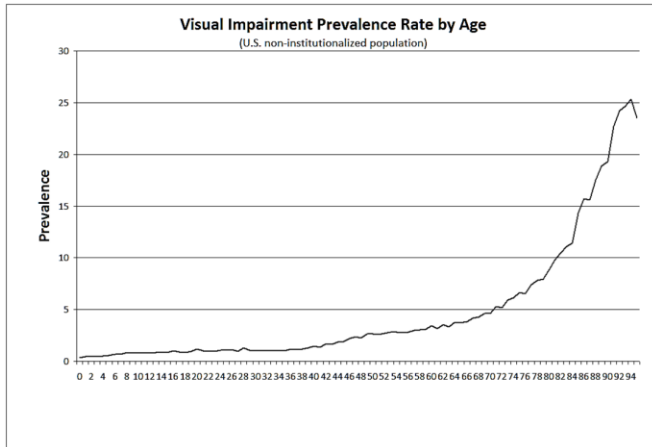

Figure 1: Prevalence rate of visual impairment by age based on analysis of the 2008 American Community Survey PUMS data by William Erickson, Employment and Disability Institute, Cornell University, November 2, 2010

But not using a computer leaves a lot of elderly consumers missing out on a tool that can connect them to the world; enable them to access books, banking and shopping; add the enjoyment of hobbies and games to their lives; and much more.

The good news is that there are many things one can do to enhance the visibility of text and images on PCs without purchasing or installing anything. Nor is there anything new to learn to use for most of these. Many of these changes can be achieved with a few mouse clicks, do not change the overall integrity of the window structure, and generally can be set once and then retained in a new template or feature set. These include features built into MS Windows (in addition to accessibility features), features built into MS Office, options built into browsers, ways of using the mouse, and built-in monitor settings.

TRICKS AND TWEAKS TO MAKE SCREENS EASIER TO SEE

Enhancing text in MS Word

Here are 10 ways to modify text in MS Word in ways that may make them more legible to people with low vision:

1. Increase font size
2. Zoom
3. Change typeface
4. Increase character spacing
5. Increase text line spacing
6. Make text bold
7. Change background color
8. Change font color
9. Reduce margin size
10. Remove toolbars

Increasing font size (which can be accomplished with a single click), zooming, and making text bold are, in effect, forms of magnification, so it is easy to see how they can be useful for consumers with low vision. Even people with mild vision loss, e.g. those with presbyopia, can benefit from merely making text bold. Changing the typeface also may be helpful. Some people find sans serif fonts easier to read than serif fonts, others find the opposite. There even are fonts that have been designed specifically for low vision users such as Tiresius developed by the Royal National Institute of Blind People (RNIB) [5] and APHont developed by the American Printing House for the Blind (APH) [6]. Letter crowding reduces legibility for some people. They benefit from Word's ability to increase the space between letters [7]. The space between lines of text also can be increased.

Contrast is an important issue. Black backgrounds are often appreciated by people with cataracts because black has much less light scatter than white [8]. Yellow text against a black background looks wonderfully vivid, and is the favorite combination for many.

Reducing the size of the margins provides room for large fonts and may reduce the amount of sideways scrolling needed. More vertical space can be created by using full screen view. This removes the toolbars and makes for a cleaner look.

Except for zooming and changing background colors, all of these changes (1) are retained when the document is printed, and (2) can be incorporated into a new Word template, or replace the current default Word template.

Enhancing PowerPoint text and images

The default parameters for backgrounds, fonts and AutoShapes are determined by PowerPoint's templates. However, these can be modified within the template to meet the needs of presentation designers with reduced vision, and then incorporated into a new template that retains these as new default values. Backgrounds that either are very light or very dark provide a useful backdrop for contrasting text and/or images. Large and/or bold text also generally is desirable. PowerPoint's shape-drawing tools, "AutoShapes," have default fill colors and outline colors that are determined by the templates. The default AutoShapes outline thickness for all the templates is quite thin (i.e. low weight) which may be impossible for some individuals to see, but can be made thicker. It also is easy to change the fill and line colors. The new values can be used just once, serve as new defaults for other shapes that are drawn later in the current presentation, or become the defaults for shapes drawn in a new template.

Graphs

As with documents and presentations, some graphing applications allow you to change default settings that make graphs more visible. For example some users might greatly benefit from thick yellow lines with large magenta data points against a black background. Text size, color, typeface, and bold setting also can be changed and retained.

Screen enhancements

MS Windows comes with "accessibility" tools. In the past these tended to be difficult to find, to use, and even to turn off! Windows 7, however, has introduced an excellent magnifying tool that is simple to turn on, simple to use, and simple to turn off. It is engaged by holding down the Windows key (Fig. 2) while repeatedly pressing the plus (+) key (no shift necessary). Each press of the plus key increases the amount of magnification. This magnifies the entire screen (i.e. the application display as well as toolbars and buttons). It appears to work with anything on the screen, even the desktop, Web sites, and PDFs. Pixilation may occur at higher magnification values.
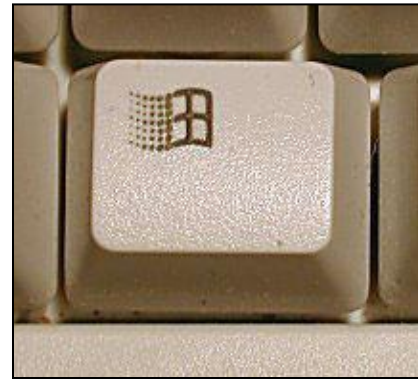

Figure 2: Windows key

Another accessibility feature converts the screen to a high contrast image, replacing the white background with a black background. This is achieved by simultaneously pressing the left alt key, the left shift key, and the print screen key. Unfortunately, this scheme seems to negate easy simultaneous use of the magnifier just described.

Windows also provides many options for making the cursor easier to see. Among these is making it "extra large" – which unfortunately only makes it a bit larger. It also is possible to make the cursor's color contrast with what is under it. This is called "inverted scheme." Cursor settings may be found in the Control Panel under Mouse > Pointers > Scheme.

Enlarging Web pages

Most Web sites, as well as email messages in some clients, can be enlarged by holding down the control key while repeatedly pressing the plus key. An added bonus is that some browsers allow the option of magnifying only text, or magnifying both text and images. The control plus + command is extremely useful for the Internet, but does not enlarge within applications.

Mouse magic

Another simple way to magnify some screen information uses a mouse with a roller, which has become quite standard. Holding down the control key while pushing the mouse roller forward (away from you) enlarges the content of applications and Web sites, but not toolbars

or buttons. Rolling toward you reduces their sizes.

<u>Magnifying key</u>

Lenovo ThinkPad computers have a third key between the left and right mouse click keys (Fig. 3). It has options for setting the size of the area to be enlarged, as well as the amount of magnification desired.

Figure 3: Lenovo ThinkPad has a magnifying key between the left and right click keys

WHO CAN BENEFIT FROM THESE APPROACHES?

A multitude of factors determines how useful these many no-cost ways of enhancing the information displayed on computer screens might be to any individual. The amount and type of vision loss certainly are important factors, but motivation certainly plays a major role as well. Some consumers do need special software, some require speech output, and some will not be able to use a computer at all. But there is no doubt that large numbers of elderly people with vision loss who cannot afford special software, would not be able to install it, could not learn how to use it, or would not be comfortable using it, could greatly benefit from some of the approaches described in this paper. The only way to know which approaches are the most useful for any given individual is simply to experiment with them – also a no-cost activity!

ACKNOWLEDGEMENTS

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