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Revelations of Adaptive Technology Hiding in Your Operating System

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Chapter 12 **Revelations of Adaptive Technology *Hiding* in Your Operating System**

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Chapter 12

Revelations of Adaptive Technology *Hiding* in Your Operating System

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Scenario:

Adaptive Technology Need

Bryce had had a work accident that greatly damaged the functioning of his hands. He was unable to grasp small objects well and his coordination was erratic. The neuromuscular condition became debilitating in many aspects of his life. Through physical and occupational therapy, he had learned to cope with the ongoing pain enough to be able to have an active and productive life. He equipped his car with assistive devices to be able to drive, and returned to school to finish his associates, possibly pursuing a bachelor's degree. He would really like to become a counselor and help people through the difficulties in their lives; it had been a tough two years, and many people had done so much work with him, he wanted to give back just like that and knew he could now.

The roadblock to his dream was school work and technology. How was he going to be able to read books if he could not hold them steady; how could he type on a computer when his movements were erratic? But he had come through so much already, he finally figured that today there must be some solution.

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He discussed the matter with the Admissions Office even before applying, so he knew he needed to head to the Student Services Office and talk with the special needs staff there. Long story short, they had a simple video series he could sit and watch or take home on a DVD to watch which explained the adjustments or adaptive resources which were now included in Windows or Mac personal computer or laptop systems. He had no idea these features were available! Moreover, the videos guided him, step by step, through finding the features and configuring them on his own computer to meet his specific needs.

In Bryce's case, the "Flitter keys" and keyboard sensitivity features were essential. They allowed him to have the computer not respond unless he really pressed hard on the keys. His multiple taps, or "flitters" as he nicknamed them, over the keys during spasms and tremors would no longer create the usual paragraphs full of typos which had been so frustrating. Then there was the text to audio feature: his computer could read the books to him if he could get an electronic copy of the text or scanned the pages in first. That meant he did not have to wrestle constantly trying to read a book and could instead focus on content.

Bryce was thinking, "If I found this much free assistance in just one week, imagine what else is out there? Why did I delay in coming back to school and pursuing my dream? My life is opening up."

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Introduction to Premise and Definition

This chapter is about people like Bryce, in situations both less and more severe, “normal” people, any graying generation, you, and me. We will be focusing on simple and free technology resources and programs which are provided with the major operating systems (OS) (Windows Vista, Mac OS X and Linux). The fortuitous and startling point of this situation is that other than the original cost of your OS, there are no additional fees, nothing additional to install before using the features and programs we include. Certainly you cannot compare the features of these free tools to high-end products, but it is surprising how people who are familiar with the resources and tools in detail can determine unique ways to meet many physical learning challenges. Easy to use, no additional cost, and easy to learn, these parameters also create a rapid learning curve. Up and running, plug and play, adaptive technologies meet the needs of our diversely and differently-abled society (People’s Movement for Human Rights Learning, 2008).

Differently-Abled

This phrase differently-abled has become a positive synonym for the older terms disabled or handicapped. In the field of special needs, the phrase has been adopted because it emphasizes the point that people have different abilities and while some people have limitations, it does not mean they have *no* abilities. By using this phrase, we are building a more positive approach to understanding the abilities and desire for self-sufficiently these people strive for and communicating how the general public, educational and training and medical system can best support us in the quest for independence. (Bausch, Ault, Evmenova, & Behrmann, 2008; People’s Movement for Human Rights Learning, 2008; United Nations, 2008)

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The following quote from Hitchcock and Stahl (2003) describes how special education curriculum purpose and design has changed: the emphasis is now on bringing these students into the same goals and objectives for all learners:

Traditional special education was designed to provide specialized educational services to achieve what too often was a set of goals that differed from those of general education. Today, special education services align the skills and abilities of students whom are perceived to be different than most learners within the existing general education curriculum. The student is at the center of defining the problem, although it is becoming apparent that the barriers that exist within the general education curriculum itself are what need to be examined and minimized (Hitchcock, Meyer, Rose & Jackson, 2002). To achieve this goal, materials, methods, and assessments must be designed from the start to be flexible and supportive of diverse styles and abilities. (p. 48)

It is widely documented that a positive attitude in medical and educational settings reaps positive results in motivation, perseverance and outcomes. (Bausch, Ault, Evmenova, & Behrmann, 2008) While it is not easy to change current language conventions, the benefits of this small language change can be significant for the individuals who are in the situation and all people involved in the support system.

Differently-abled can included a wide variety of conditions and different levels/extents of limitations. From large and small (gross and fine) motor skills in hands, feet, arms, and legs to differences in vision, hearing, speaking, and comprehension, the scope of challenges is wide and the severity of limitations varied. Some people might be able to hold a cup, and pick up a book, but not be able to control detailed movements with a traditional pencil, mouse or keyboard. Therefore, many different types of tools and adaptations are needed to address these situations and build confidence and self sufficiency. Solutions range from free technologies and adjustments included in computer software, and simple daily modifications of routines, to others requiring moderate to extensive modifications or extra resources. Because the needs and

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solutions are widely overlooked, this chapter introduces and highlights those solutions which can help everyday people and the differently-abled at no additional cost.

Differently-Abled Does Not Mean NOT ABLE

In this brief self-disclosure, I use myself as an example to explain the difference between what you might see when looking at a differently-abled person and what might be the real situation. I offer this real-life example because it will be more meaningful to our readers and the example may help break down preconceptions that are not often thought about by people not afflicted with these daily limitations.

When you see me in public I am usually using a 3-wheeled motorized scooter. People assume I cannot walk, but they also jump to conclusions such as “She cannot hear, she cannot think for herself and she is on disability.” When I ride up to the podium at a conference keynote or session, many people looked puzzled.

Certainly, this reaction is compounded by the fact that I am widely published and my name is well-known in my field, yet I do not often talk about my physical condition. So they have assumed I am “like everyone else.” Guess what: I really am!

Besides the issues of ability I have addressed, let us turn to the actual limitations. I cannot walk long distances (around the block, a conference center, mall, university). On good days my spinal condition and chronic pain are in well enough managed that I can walk

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around the room, stand intermittently and teach for about 30-45 minutes, and greet people at my door. The scooter makes keeps me from becoming homebound, and keeps me able to enjoy being in public instead of suffering severe pain and muscle spasms for days afterwards. No brainer, this is pretty essential, right?

As mentioned, I have an invisible condition called chronic pain which is under the control of myself and several highly specialized doctors. I have an internal device which drips medication into my spine 24/7. I use mindfulness, meditation, relaxation, and music therapy to control some minor pain myself, and I manage my schedule tightly to not be overly active frequently. However, this chronic pain comes from several spinal conditions which could be debilitating: I do have to work hard to keep it under control. Yet the only evidence to the outside world is the scooter and my cane when I walk across a room.

It might appear to be arthritis or bone disease, isolated to walking. Instead, it is a life-consuming difficulty which I have to manage daily and hourly. I choose not to discuss it with most people, as there is no need to, and since no t-shirts are made which fit with my stylish suits, I cannot broadcast it. And why would I?

The point is that often what we *see* with a differently-abled person is not the whole story. We can never make assumptions about what they can or cannot do what the condition is or what we think they should be able to do. Most people would not overtly assume to do

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any of these things I know, but it comes through in the ways we interact with people and the choices we sometimes make for people. I hope this sharing has guided you to reflect on the actions you can take in the future and to think about those people in your life you might have made assumptions about. Give them a chance to tell you what they need and want, if they want to. They will likely respect you for respecting them and asking.

Revelations and Premise of OS Adaptive Technology

Premise

The premise of this chapter is that there are many people who have needs for adaptive technologies that might never even consider; much less avail themselves of, specialized software. However as people who continue to learn across our life spans, our vision, coordination and hearing change due to temporary physical conditions, aging and disease (Merriam, Caffarella, & Baumgartner, 2006). An added benefit of this broad group of people becoming more familiar with adaptive technologies is that it also reveals an entirely new world of technology accommodations for people with minor through severe needs.

As illustrated in Figure 1, building awareness of solutions, raising awareness of needs, and realizing solutions are readily available can culminate in building a more supportive environment for everyone. Moreover, in this diagram, the different shape arrows are purposefully designed in two shapes: unidirectional for the overall flow of the diagram, and yet bidirectional.

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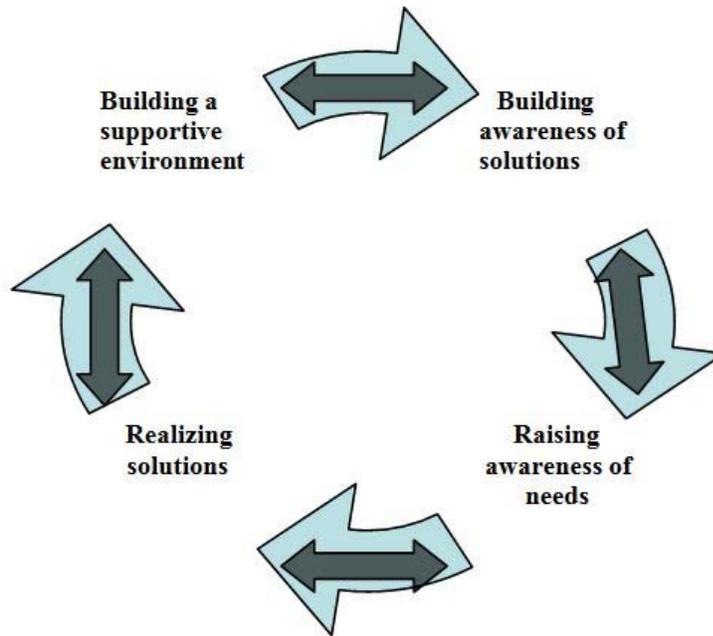


Figure 1 Relationships among Awareness, Solutions and Support

This design reveals a progression of connection and experience. For example, as people grow and change, they are exposed to new information constantly, and the process is continually rotating and feeding information throughout the wheel. It is not a rigid or strictly linear growth of understanding and awareness. Instead, this development is much more dynamic, fluid and ever-growing in the possibilities of application across current and future situations.

The diagram helps us understand the process we experience as all educators and lifelong learners need to become aware of adaptive technologies, thereby expanding our worldview of differently-abled people, resources, support needs, and solutions. It is a diagrammed process which builds upon models of transformative learning (King, 2003, 2005; Mezirow, 1978) and the changes people experience as they encounter new ways of making sense with their world, as well as culturally responsive teaching (Wlodkowski, Ginsberg, 1995), which affords ways to examine

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needs and information from multiple perspectives. Both are widely accepted models, but not often connected to how we comprehend and view the changing ability needs of learners of all ages.

Revelations

While another chapter in the book will go into detail about more advanced and diverse options for adaptive technology, this chapter serves more as an introduction to the mostly hidden treasures of onboard solutions. All of the resources shared in this chapter are included at no additional cost in the original operating system. Yet through experience, we know that very few people know the adaptive technologies are there or how they might be used. This is a chapter of revelations!

In many situations, it is an extraordinary discovery that the computer already has solutions like these:

- To magnify part or the entire screen for those who are having visual difficulties,
- To enable read the screen aloud with a click of a mouse button when one cannot sit upright or see the pages well, or
- To adjust use a mouse as a keyboard so hand tremors do not create constant, frustrating typographical errors.

In these cases it is a screen magnifier, narrator and on-screen keyboard (respectively) which are supplied with the Windows™ OS. These features can each be all found in the All Programs menu, subheading Accessories, and folder Ease of Access. On the Mac OS X, the Text to Speech, Cursor Magnification and Screen Magnification features among other

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accessibility tools are available in Finder. These very simple examples just scratch the surface of what is available and the possible needs that might be fulfilled!

Needs Which Can Be Addressed and Related OS Technologies

Consider the wide variety of needs which might exist or arise that can be addressed with adaptations to your computer system. These adjustments or mini-programs (applets) not only assist in computer use, but also make it possible to do other functions with the computer's aid that people could not accomplish otherwise. In this section, the needs which might be addressed are listed and briefly, explained in non technical terms to demonstrate the scope of assistance. This section provides illumination by also revealing those which might have been invisible, unnamed, or forgotten; in this case it is empowering to name these cognitive and physical needs. Several categories provide clarity and frame this overview: ergonomics, motor skills and related pain, visual and hearing difficulties.

Ergonomics

The issue of ergonomics has reached a critical level in our society. Examining the catalogs, stores and websites of office supply stores reveals a copious variety of ergonomic office chairs, keyboards, mice, trackballs and devices because of demand and supply. The field of ergonomics has evolved to termed "human centered" as it is the user who is the center of the efforts and studies (Kroemer, 2006). Ergonomics incorporates many disciplines including a host of medical science specialists, policy makers, human resource specialists, trainers and research and development specialists.

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As early as 2001 the Department of Labor recognized the serious trend already evidence in the 21st century.

The new data released today by the Bureau of Labor Statistics covering 1999 shows us where our efforts are succeeding and where we need to direct our focus as we move toward developing a 21st Century Workforce.

One interesting point in the study is that as more Americans were in the workforce than ever before, the number of ergonomics-related injuries continued to decline. However, musculoskeletal injuries accounted for nearly one-third of all the injuries. This finding demonstrates the need for a solid, comprehensive approach to ergonomics. (US Department of Labor, 2001, para 2-3.)

Recommendations for practice are supported now by the Department of Occupational Safety and Health Administration (OSHA). Yet despite the soaring number of bad backs, RSI and carpal tunnel syndrome, private citizens seem uninformed regarding the seriousness of and recommendations for ergonomic best practice (King, 2008). Even though the U.S. Department of Labor has developed a website, educational materials and literature describing concept of “neutral body positioning” few people are reading or listening until they are in great pain. Information on that site describes how to check for more correct body alignment and diagnostic tools. The concepts described in the following explanation provide a starting point to build understanding if information was regularly included in personnel orientation and personal medical checkups regularly:

To understand the best way to set up a computer workstation, it is helpful to understand the concept of neutral body positioning. This is a comfortable working posture in which your joints are naturally aligned. Working with the body in a neutral position reduces stress and strain on the muscles, tendons, and skeletal system and reduces your risk of developing a musculoskeletal disorder (MSD).

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(US Department of Labor, 2006)

Motor Skills

While ergonomics applies to everyone who uses technology, equipment, furniture, devices and machinery, the difficulties which arise from not learning appropriate ergonomics are realized through many sources of pain, conditions, and ailments. In addition, hereditary, degenerative, and infectious disease, as well as trauma can result in physical damage which impairs motor skill function.

Scenario

Grant is finding that checking student emails, grading papers and conducting correspondence, the absolute minimum of computer use for teaching, is becoming excruciating. He is fearful that mentioning this will raise attitudes of ageism and reveal his decades-long struggle against arthritis in his shoulders, elbows, hands, and now fingers. But he knows that with all those gadgets he sees the students and some faculty use, there must be a way to gains *some* technology related help.

- Can he stand the risk of saying he has pain?
- Whom does he speak to about the situation?
- Will his conversation be held confidential?
- How much does such extra equipment cost?

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While this might sound melodramatic to some people, the fears and consequences are all too real for people of all ages. Unfortunately, most cultures, especially Western, do not respect medical illness or regard it as suffering. In the workplace, countries and organizations have had to institute laws to protect people from discrimination based on illness, disability and the like because of the abuse they have experienced (American with Disabilities Act) (US Codes, 1990, 2008). So while in our scenario Grant is developing many fears without solid information, some it is based in reality. Certainly confirming confidentiality in the discussions, and then seeking assistance and guidance from the university's human resources office for accommodations, disability services or the information technology department is in order rather than feeling trapped.

Usually, the basis for motor skill difficulties which many people experience can be related to any one or more of the following: skeletal, muscular, or nervous system. The symptoms can be evidenced in arm, wrist and hand pain, stiffness and malfunction (medically termed, dysfunction). The causes are familiar to us: arthritis, rheumatoid arthritis, carpal tunnel, repetitive strain injury (RSI) (Ergo web, 2006), neuropathy (often related to diabetes), and more. With so many common causes, one can see it is helpful that assistance to reduce pain and suffering is only a few clicks away *hidden* in your current computer!

Options for coping with difficulty typing range from changing the responsiveness of the keyboard, to clicking an on-screen keyboard, to dictating into a microphone attached to your computer and having it type for you (Speech to Text in Windows, Voice Over in Mac). At this time, all these features are in the Ease of Access subfolder in the Programs Menu in Windows Vista (Microsoft, 2009). The adjustments and programs listed in Table 1 can provide substantial

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assistance. For additional details and video tutorials about these and other features, visit the Microsoft and Apple accessibility web sites:

- <http://www.microsoft.com/enable/>
- <http://www.apple.com/accessibility/>

Motor Skills and Pain Symptoms	OS Adaptive Technology Adjustments and Ergonomics
Difficulty hitting only one key- keyboard adjustment	<ul style="list-style-type: none"> • Change keyboard responsiveness • Change the pressure speed of key clicks • Change keyboard responsiveness • Windows Filter keys
Difficulty with fine mouse movements	<ul style="list-style-type: none"> • Change sensitivity of mouse responsiveness • Use mouse pad with a wrist rest
Difficulty with too rapid mouse movements	<ul style="list-style-type: none"> • Change the speed of the mouse of the screen • Change the speed of the cursor
Need more shortcuts for keystroke combinations	<ul style="list-style-type: none"> • Reprogram function keys, create macros; or program an extra mouse button or wheel • Windows Sticky Keys, also Macro/recorder • Apple Automator
Difficulty typing- pain, stiffness	<ul style="list-style-type: none"> • Use speech to text features/programs for long or short passages • Change angle of keyboard • Use wrist rest of keyboard
Difficulty with mouse control	<ul style="list-style-type: none"> • Use speech recognition to basic command computer functions

Table 1 Mapping Motor Skills and Pain to OS Adaptive Technology Adjustments

Visual Difficulties

Scenario

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It was the 3rd week of junior year in college, Brendan called home, “Mom, I think something is wrong with my eyes, and I am going for a checkup. I have narrowed down the blurriness and headaches to when I use the computer a lot. These advanced classes in engineering require a lot of design time on my computer and I think that is how it is kicking off even more than usual. Does it make sense to you? Where do I go to get my eyes checked?”

Medical experts say that it is no coincidence that vast numbers of people are seeking medical help for headaches, blurry vision, stinging sensations in their eyes and neck aches. The fact is that the devices we use and the nature of tools we use to do most of our work in the 21st century has shifted to a range of 1-3 feet (Anshel 1999; Reed, 2004). Whereas for centuries homo sapiens had done work and activities at varied focal lengths (distant, mid-range and near), today recreation, and work alike are pursued at a close range (Anshel, 1999). For instance, consider how many hours per day we are engaged with *any* of the following: computers, cell phones, PDA's, MP3 players, handheld gaming devices, and close range TV viewing for gaming. Moreover, this trend is regardless of one's age group or demographics situation. The result is that our change in habits is expanding and accelerating visual problems for larger numbers of people.

The condition described above has several names at this time to differentiate causes and symptoms. Various known as visual fatigue, visual fatigue syndrome or computer vision syndrome, there has been a surge in recognizing and being able to treat people who suffer from these frustrating and painful visual, neurological and sometimes muscular disturbances (Reed, 2004). Indeed, many health professionals will discuss ergonomics and lighting for patients, but then also consider whether corrective lens may be of assistance. This chapter also poses the possibility that adjustments made to computer use could assist in mitigating the problems and could be included in the first, no-cost round of corrections advised.

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In addition to this growing phenomenon of eyestrain, there are many other problems people experience with their sight. For example, some people may have difficulty seeing certain types of figures or details based on neurological conditions; others have difficulty with contrasts of color, or color blindness, differentiating visual spatial relationships, or following moving objects, or lights on screens. The reality is that these situations can be invisible to other people unless the individual has severe impairment that disrupts their interaction with us. Making assumptions about what people see on a computer screen, book page or poster can be detrimental and embarrassing in these circumstances. We need to recognize that learners with special needs can be addressed with dignity and support in our classes (King, & Griggs, 2007).

Building greater awareness of the variety of visual difficulties people have and all people may encounter over years of work with close range devices and as maturing adults provides a platform to inform about resources to help all.

As listed in Table 2 several significant tools are again hidden in the operating system toolbox which can help alleviate some of the struggle which visually impaired individuals may experience.

Visual Difficulties	OS Adaptive Technology Adjustments
Difficulty seeing details on screen, video, text	<ul style="list-style-type: none"> • Use Windows Narrator, Apple Text to Speech or other to read text aloud • Use screen magnifier to zoom in on sections of screen • Use software zoom features • Use the screen contrast feature • Use the screen resolution adjustment
Visual fatigue, visual fatigue syndrome or computer vision syndrome symptoms: Headaches, eyestrain, blurry eyes,	<ul style="list-style-type: none"> • Use Windows Narrator, Apple Text to Speech or other to read text aloud • Use screen magnifier to zoom in on sections of screen

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neck pain, dry eyes, stinging eyes	<ul style="list-style-type: none"> • Use software zoom features • Use the screen contrast feature
Difficulty reading text	<ul style="list-style-type: none"> • Use Windows Narrator, Apple Text to Speech or other to read text aloud
Difficulty seeing menus for computer operation	<ul style="list-style-type: none"> • Use speech recognition to basic command computer functions

Table 2 Mapping Visual Difficulties to OS Adaptive Technology Adjustments

The Screen magnifier, software and browser zoom features, as well as screen contrast settings are fundamental settings which all readers should explore. Based on their operating system (Windows, Mac, or Linux), the settings might be named differently, but the features will be available. Certainly, each of us has received documents which need to be magnified for ease of viewing. A wise strategy is to employ the two or three keystrokes to zoom in on the text, chart or figures in order to reduce eye strain. It is not surprising that most people are not in this habit and will incur extra strain unnecessarily, because few of us have had formal instruction in computer ergonomics and visual ergonomics.

The screen reader tools are also invaluable for all users to provide some visual reprieve. Are there times you can have a report read aloud to you, rather than reading yet another document? Can you time your work so you can listen to one document, while doing something else in the office? This promotes good ergonomic habits as well, as you might be able to stand up and move around while still listening to the reading you need to accomplish. It is not always working harder that is needed. In these cases it is clear that working smarter is the means to running the longer race! Using the free OS tools and considering different work habits may breathe new strength into weary professionals.

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Deafness and Hearing Impairment

Hearing impairments can be frustrating in personal and professional settings. Indeed, with age comes a standard progressive increased ossification of the tiny bones in the inner ear which will result in hearing loss. However, many people suffer neurological congenital, trauma or disease related hearing damage which will disrupt their lives to different degrees.

While most of the work done on computers can be conducted without hearing as a primary sense, it is surprising how different it is to interact with computers if you cannot hear the click of the keys and mouse, the system warning signals and listen to the scores of audio and video which are circulating on the web and for training functions in the workplace. Fortunately the OS again provides some degree of assistance in these areas. Table 3 reveals how different functions can be adjusted or used to bridge the gap of hearing impairment or lack of hearing.

Hearing Difficulties	OS Adaptive Technology Adjustments
Difficulty hearing video, audio, audio books, music, computer system alerts	• Use Sound Settings to increase volume
	• Use speakers, ear buds, headphones to magnify volume
	• Need to find materials with closed captioning features
	• Need to find transcripts
Difficulty keeping up with speed of audio	• Use media player to slow down play back, Windows Media Player, iTunes- all free
Difficulty hearing computer system alerts	• Use light and popup balloons basic command computer functions

Table 3 Mapping Hearing Difficulties to OS Adaptive Technology Adjustments

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Indeed, by adjusting the sound setting controls, some people may be able to amplify sound enough to hear the sounds which are usually muffled for them. Probably the three most valuable on board features are however, (1) the ability to set your computer to pop-up windows and make the screen flash when an error message occurs (Apple names this Visual Alert) (Apple, 2009), (2) using the media players to speed up or slow down the play back of audio and video, and (3) Talking Clock (Apple, 2009). In the case of video, this might afford the opportunity for people to more easily lip read the video actors. In addition, if the impairment is not too severe, the slower pace can aid in discerning the words. Some players such as QuickTime include close captioning capability, if the audio or video are recorded with this information (Apple, 2009).

This review highlights the fact that hearing impairment is least addressed through the OS adaptive tools. On board features and tools which can transcribe reliably need to be moved into the OS. Moreover, generating transcripts for video and audio needs to be a mainstream feature, rather than an add-on and difficult process. There are many other excellent applications for which such transcript creating software could be used. Proprietary products have advanced greatly over the years, but we need the integrating with the OS and more reliable 100% transcription.

Recommendations for Handling Instructional and Professional Needs

This final section suggests how faculty might begin to incorporate adaptive technologies into their instructional and professional roles. Given the relentless work of the clock on our bodies' health, developing good habits early in our careers and learning about strategies which may be adopted as needed, may preserve our well-being and participation in our careers longer!

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Give Your Back a Break Today

On those days when you are doing an extraordinary number of hours of computer work, consider how you can breakup the routine of your day and work in blocks of times. Medical experts say we need to shift our position at the computer every 20 minutes, and we need to look away from the computer about as often. Evaluate and reconsider how you might plan your time and space. The following configuration describes three different settings that one might rotate among during a long computer use day. Completely changing positions every two hours makes a substantial difference in all the body systems and reduce back, neck, eye and muscle strain.

Multiple Computer Work Area Configurations:

Station 1: Desk with ergonomic chair at correct height, monitor and keyboard aligned

Station 2: Couch with lumbar cushion and lap desk to have laptop positioned at correct height

Station 3: Sitting at the dining room or conference table, using a laptop lift to align the laptop screen more fully with your eyes and us proper chair.

Be Kind to Your Eyes

Another viable strategy is to consider whether some tasks can be done with a different input mode. If you have a lot of information to input, a draft of an article or a book, responding to correspondence, writing a report, why not use a voice to text software to do the typing for you. Inputting the first large draft can greatly reduce the number of hours at the keyboard and provide a change in body use which aids well-being.

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Moreover as mentioned previously, get into the habit of using the magnification and zoom features in your software and the OS. Learn the hot keys so you can click a few buttons (Windows version: Ctrl + PLUS; Apple version: Apple Key + EQUAL) to zoom in and zoom out (Windows version: Ctrl + MINUS; Apple version: Apple Key + MINUS) on a browser screen and many other programs. Determine if your major programs have quick ways to make the adjustments; and if not, use the zoom function, or computer screen magnifier. Once people start breaking the habit of squinting at small print, they never turn back and their eyes are much less strained!

Buy Back Your Free Time

The final recommendation addresses file management and streamlined planning of the work we do as professors. Evaluate the file planning system you have on your hard drive or server. Are you using the file folders so you can find the documents you need easily? Do you need to consider a different layout? Again, we are so busy with our work we often do not pause for these housekeeping essentials, but if we have predictable filing systems, the time at our computers can be reduced! The other aspect of this suggestion is to create folders which can be templates for many of the repetitive tasks you perform in your professional role. This tactic will decrease redundant typing and improve efficiency.

We are familiar with form letters, and most of us will build references from portions we have written before, but let us expand the model further. When students hand in certain types of assignments, there are many similar comments you make on papers about errors, research,

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writing, content, etc. Are there instructions, help sheets or assistance they need every semester?

Consider developing a few templates and master sheets each semester.

- How to do a literature review for Professor Mudd.
- The critical eye for historical research by Dr. Choi.
- Grading comments for mid-term essay exams.
- Research related comments for Psychology 501 final paper.

Another important time saving feature is to think in terms of repeatable keystrokes or frequently used long phrases. In Apple, it is Automater (Apple, 2009) and in Windows it is founding function called Recorder or macros.

These strategies will assist all educators in working more efficiently and being able to minimize the eye, muscle and back strain which is becoming synonymous with computer use.

Conclusion

This chapter describes not only the copious number of free assistive technology tools which are hidden in our computer operating systems, but also the host of physical difficulties which we encounter in the Information Age. This information is empowering for all people because it reveals how to make computer use, and professional work, more accessible and efficient for all of us. The chapter has also developed critical concepts of differently-abled individuals, ergonomics, invisible disabilities, physical impairments, empowerment, and independence. By discussing these topics we are bringing to light conversation topics which are too often solely relegated to special education discussions instead of everyday consideration.

The focus of the chapter is on all people becoming aware of the free tools and functions available through their current computer's OS. Additionally, we have approached how all people

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can work more efficiently to reduce computer time. Ultimately, as time passes, and joints are sore or eyes more strained, we will all benefit from these features. In the meantime, reading this chapter empowers all educators to recommend free adaptive technologies for students and colleagues, we are mobilizing the masses to be advocates for well-being, and empowerment of differently-abled individuals.

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