COMMUNICATING GRAPHICALLY
FOR PEOPLE WITH VISUAL IMPAIRMENTS

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ABSTRACT

The purpose of this study was to analyze the current status of the interaction between the graphic communication industry (specifically publishing, web development and education) and the population of visually impaired individuals.

The study researched the standards in place, the level of accessibility of resources, the level of satisfaction among people with visual impairments, and suggestions for improvements within the industry. The research methods included elite and specialized interviews with educators and industry professionals, historical research of documents and regulations on accessibility and descriptive research of three providers of resources for the visually impaired community.

The results show that while standards are in place for government related agencies and funded programs, there is a lack of education among publishers and designers on the needs of the visually impaired. As well there is an issue of funding for the products needed. There are potential improvements within the graphic communication industry including more content availability among publishers, and improved printing technology. As well, recent advances in web and computer software technology have shown optimism that accessibility to content provided by the graphic communication industry will be increasingly more available for people with visual impairments.

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CHAPTER 1: INTRODUCTION

Approximately forty-two million people in the world are blind. This number does not include the various partial impairments that restrict the ability of an individual to gather information visually. The sole purpose of the graphic communication industry is to convey messages through visual vehicles, whether in print or web form. Publishing, the Internet, and learning materials in education are some of the important products produced in the industry that cannot be grasped by people with visual impairments in the way that the average consumer attains the information. This creates a wide range of problems that these individuals face by living in a world that is largely occupied by graphic forms of communication. The industry should provide certain adaptations and standards to include this population, or the messages that are being sent will be lost in translation and a large revenue stream from visually impaired customers will be forfeited.

This study asks the questions: What are the existing standards and adaptations in place within in the graphic communication industry, specifically publishing, web development and education learning materials, to address the needs of people with visual impairments? How are these needs maintained as far as costs and feasibility? Through researching areas within the industry as well as authorities on standards, this study will deliver what is the current status for people with visual impairments.. This study will also research the costs and processes involved in maintaining the needs of people with visual impairments in the areas of publishing, education and web development of informational sites. This study will also strive to find potential solutions that the graphic communication industry can provide in order better serve visually impaired individuals. Through emerging technology in digital printing, web development, and desktop solutions the industry can make resources more readily available and affordable.

The purpose of this study is to examine the extent to which the graphic communication industry is addressing the needs of people with visual impairments, and to offer solutions to current or future problems the industry will face in striving to address this population. The findings will provide examples of models that are working within the industry to provide

sufficient communication to people with visual impairments, evaluate costs and processes

involved in facilitating the needs of people with visual impairments, and the added benefits

of including people with visual impairments in the graphic communication industry.

CHAPTER 2: LITERATURE REVIEW

Access to publications made for people with visual impairments, while available, is expensive and limited, and constantly evolving technology brings up the question of how prevalent the current resources will remain. The current status of print materials for people with visual impairments can be summarized as limited, expensive and dominated by Braille and large-print reproductions. Education departments as well as visually impaired individuals can find large print materials in the following places, according to Andrew Leibs in his article *Blind Reading Resources-Large Type.*:

- Low-vision education publishers & institutions
- Commercial publishers
- Public and low-vision libraries
- On-demand large-print production
- Do-it-yourself text enlargement

The majority of these publications are supplied by the American Printing House for the Blind (APH) in Louisville, Kentucky. The article also states that the following limitations occur with the large print publications

- Clarity: enlargement can lessen image resolution
- Typography: high-contrast print can be tiring to read in long stretches (Leibs)

Research has found that large print books could continue to grow because of an aging population. Robert Dahlin points to this finding in his article *Large-Print Publishing—A Site for Sore Eyes?*,

> According to the recently published fourth edition of "Vision Problems in the U.S." released by Prevent Blindness America, the number of Americans with age-related eye diseases that will result in vision impairment is expected to double in the next three decades.

Dahlin also finds that many publishers including Random House are increasing focus on the market of elderly readers with degenerative vision problems. "Supporting the line with ads, postcards and easel-back posters, RH this year launched an 'Easy Fit' campaign with the tag line: 'Large Print is as comfortable as your favorite jeans.' On the publisher's list are some 60 large-print books this year." (Dahlin)

Braille is the sole publishing option for the completely blind. It has evolved over the years and currently according to Rick Brown in his article *A History of Publishing for People Who Are Blind*

> Braille books are printed on hand fed presses which have been adapted for that purpose. Braille magazines are printed on automated presses using a special heavy paper but printed dry. Today, approximately 50 million pages are printed annually in Braille. The American Printing House for the Blind prints and distributes Weekly Reader*, and Reader's Digest*. (*Registered trademarks of the Reader's Digest Association, Inc. and the Weekly Reader.) In addition, the American Printing House for the Blind has been awarded contracts by the IRS for producing their materials in Braille and by the National Library Service for the Blind and Physically Handicapped for Braille books and periodicals.

Brown also points out that developments in technology have decreased costs and increased accessibility:

> The development of the laser printer in the mid-1980's opened up a new world for would-be-publishers. As a result, a publication could be produced at a much lower cost than any other previous technology. So it is today with publishing in Braille. What brought this about is the development of special software and printers to publish works in Braille. Text embossing printers (also called "TED") are now on the market that output files in pages embossed in Braille. Enabling Technologies makes Braille printers ranging from smaller, personal embossers to larger, high speed units. The cost of a mid line model averages about $3000. (Brown)

Issues of cost and accessibility are not the only limitations with Braille and large print. Janice T. Pilch finds in her Issue Brief : *Treaty for Improved Access for Blind, Visually Impaired and Other*

Reading Disabled Persons that copyright laws are also an issue.

> Visually disabled people need to have access to copyright protected works in readable formats, such as Braille, large print, and audio versions, and other formats that can be made using innovative technologies. National laws in some countries allow such copying and adaptation without the permission of the rightholder. In other countries, however, these acts could infringe copyright if undertaken without authorization.

Pilch also found the following list of limitations for publications for the blind and visually impaired:

- The World Health Organization estimates that there are 314 million people worldwide who are visually impaired. Of these, 45 million are blind, of which 90 percent live in low-income countries. According to a recent report on blindness and visual impairment, the actual magnitude of blindness and visual impairment is likely to be higher than estimates indicate.
- It is estimated that in the United States, less than 5 percent of published works are available in accessible formats. Some 95 percent of books never become available to blind and partially sighted readers, who use alternative formats such as audio, Braille or large print. The figure is even lower in developing countries.
- The majority of accessible format books are produced by specialized charitable organizations with limited resources. These organizations use copyright exceptions to produce books in the countries where they exist.
- The recent WIPO Study on Copyright Limitations and Exceptions for the Visually Impaired, prepared by Judith Sullivan, reports that significantly fewer than half of WIPO Member States have been found to have a provision for visually impaired people in the national copyright law. The study identifies and analyzes 57 specific exceptions in national laws.
- It is believed that 95 percent of accessible works are produced under copyright exceptions, and that only 5 percent are produced through licenses with copyright holders. (Pilch)

Aside from publishing, the reliance on the internet for information has also caused web development to change its standards to include people with visual impairments. Currently the government has been the main push for this accessibility in order to comply with the American with Disabilities Act and Section 508. The section 508 website states that its purpose is to

Implement section 508 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794d). Section 508 requires that when Federal agencies develop, procure, maintain, or use electronic and information technology, Federal employees with disabilities have access to and use of information and data that is comparable to the access and use by Federal employees who are not individuals with disabilities, unless an undue burden would be imposed on the agency. Section 508 also requires that individuals with disabilities, who are members of the public seeking information or services from a Federal agency, have access to and use of information and data that is comparable to that provided to the public who are not individuals with disabilities, unless an undue burden would be imposed on the agency.

The document specifically outlines the standards for web-development, which can be found in Appendix A. (Section 508)

Also, in 2008 the W3C- World Wide Web Consortium, revised their original guidelines on web accessibility:

Web Content Accessibility Guidelines (WCAG) 2.0 defines how to make Web content more accessible to people with disabilities. Accessibility involves a wide range of disabilities, including visual, auditory, physical, speech, cognitive, language, learning, and neurological disabilities. Although these guidelines cover a wide range of issues, they are not able to address the needs of people with all types, degrees, and combinations of disability. These guidelines also make Web content more usable by older individuals with changing abilities due to aging and often improve usability for users in general.

The guidelines go into great detail which can be found on their website. (Guarino)

Another area that graphic communication influences accessibility for the visually impaired is within the classroom. Paraeducators are responsible for maintaining the daily needs of students with visual impairments. This largely involves adapting learning materials to include students with visual impairments in the daily lessons. Denise Mackenstadt discusses the importance of this role in her article *The Role of the Paraeducator in the Education of Blind Children:*

Because of the growing caseloads of itinerant teachers of the blind, assistants are

increasingly on their own for the majority of the workday or even week. We are expected to reinforce the lessons the itinerant teacher teaches. We even provide daily instruction when needed. In addition, we are often the ones who adapt and produce Braille, tactile, and large print materials for the students. As a result we are fulfilling two very demanding jobs in one. We are the school transcription-ists, and we are aides who must be available to the classroom teacher to provide whatever assistance is deemed necessary in the classroom. Many of the skills that a blind person needs to be successful are taught by paraprofessionals. We are teaching keyboarding, daily living skills, adaptive techniques for reading and math, and how to get around the environment with a cane. When the regular classroom teacher has a question relevant to blindness many times we are the people they look to for answers. (Mackenstadt)

Much of the adapting and transcribing she discusses is most likely done on desktop printers and computers that the state supplies to schools and may not be sufficient for these needs and as well may not be trained in pre-press or print.

Clearly there are some standards in place within the fields of publishing and web-development, but the issue is complex. When it comes to education, the answer is even more complex and unclear. This study will further investigate the standards and accessibility for people with visual impairments within the graphic communication industry specifically within publishing, web development, and education, and whether the needs of people with visual impairments are sufficiently being met.

CHAPTER 3: RESEARCH METHODS AND PROCEDURES

Research was conducted using the following methods: elite and specialized interviews, historical and descriptive research, and content analysis in order to assess the existing standards and adaptations for people with visual impairments within the publishing industry, web development, and education learning materials. This research, as well, reviews how these needs are maintained in regards to cost and feasibility, and if the needs of people with visual impairments are sufficiently being met.

Elite and Specialized Interviews

Various elite and specialized interviews among experts in the subject were conducted. According to Dr. Levenson in his manual Some Ideas About Doing Research in the Graphic Communication Industry, "The elite and specialized interviewing procedure requires asking precise, open-ended questions, but questions that are open to refinement as the research and interview continues." (Levenson) The goal of the elite and specialized interviews was to gain the advantaged opinion of professionals and experts in the fields of publishing, web-development, and education as it pertains to the standards and adaptations for people with visual impairments within the graphic communication industry. Specifically the interviews provided insight into how these adaptations are made and if the needs of people with visual impairments are sufficiently being met. A questionnaire was created for all of the elite and specialized interviews in order to compare and quantify answers. This questionnaire can be found in Appendix B.

The following professionals were selected to participate in the elite and specialized interviews:

The first set of interviews was with professionals within the education system. Speaking with these individuals identified what the needs of visually impaired students are and if the graphic communication resources that are currently available work for effective comprehension and learning.

- Ann Hinshelwood from the Nevada County Office of Education

- Liz Cooper from the Yuba County Office of Education

- Jennifer Allen-Barker from the Cal Poly Disability Resource Center

- Jan Back from the Tahoe Truckee Unified School District

- Velanche Stewart, Web Accessibility Coordinator from the Cal Poly College of Liberal Arts

Interviews were also conducted at the CTEBVI now, California Transcribers and Educators of the Blind and Visually Impaired conference in Los Angeles. The goal of attending this conference was to find qualified professionals that are experienced in working in education, producing products for people with visual impairments, facilitating the accessibility of the various products needed within education and any other professionals pertinent to this study. The following professionals from the conference completed the survey:

- Joe Strechay from the American Foundation for the Blind

- Dr. Bill Takeshita from the Center for Partially Sighted, Director of LV services

- John Paris, Education Administrator I from the Clearinghouse for Specialized Media & Translations

- Elaine Kitchel with the American Printing House for the Blind

Historical Research

Historical researched as defined in Levenson's manual is "an attempt to establish facts and arrive at conclusions concerning past events." (Levenson). Historical analysis on the documentation of standards and adaptations for people with visual impairments was conducted. This included laws and regulations regarding accessibility. The goal was to define what has been in place within in the industry to provide standards and adaptations for people with visual impairments. This includes reviews of the American with Disabilities Act and Section 504 and 508 of the Rehabilitation Act as well as standards in place at APH, the leading provider of print resources for people with visual impairments.

Descriptive Research

According to Levenson, "descriptive research studies are designed to determine the nature of a situation as it exists at the time of the study." (Levenson) Descriptive research was conducted by creating case studies on companies and agencies that provide adaptations and resources for people with visual impairments. These include:

- CSMT (IMODS) The Clearinghouse for Specialized Media and Translations; Instructional Materials Ordering and Distribution System
- LRS Library Reproduction Service
- American Printing House (APH) for the Blind

The case studies consist of products that are available for the visually impaired, the costs, the production time of products, the accessibility to these products, research and development in place to improve effectiveness and any other pertinent information. These case studies were conducted through contacting the appropriate authorities within each company.

Content Analysis

Levenson states in his manual that content analysis "is a method for quantifying qualitative information gathered from elite and specialized interviewing, historical research, and descriptive research." (Levenson) Identifying the topics or keywords that occurred multiple times, and tabulating the number of occurrences of the commonalities provided analysis of the elite and specialized interviews. Reviewing the case studies by comparing and contrasting the companies and organizations showed how they are meeting the standards for needs of people with visual impairments. Analysis of the historical research showed documentation of standards, costs and accessibility of visually impaired resources.

CHAPTER 4: RESULTS

<u>Elite and specialized interviews</u>

Conducting nine elite and specialized interviews with industry experts and educators was the first method of research. Each interview was conducted using the same set of questions. (Appendix B). Common themes among the interviews were: a lack of funding in education, which makes getting resources to students with visual impairments more challenging, and that most graphic designers and producers of graphic materials have little to no knowledge of the needs of the visually impaired. When asked if the needs were being met overall the majority said no, or yes but with shortcomings. All interviews found that some progress has been made but there is still more to be done to increase awareness and better meet the needs of people with visual impairments.

The first question of the survey asked the question of whether or not the needs of people with visual impairments were being sufficiently met by the products from the graphic communication industry specifically, publishing, web and education. Four of the interviewees responded no, that the needs were not being met. Three responded yes but with shortcomings.

When asked how accessible the resources were in terms of cost, time of production, and availability, four interviewees responded that the resources were very expensive. When asked what kind of funding was available for these resources, five interviewees responded that the resources are purchased using state funding and Department of Education funding.

Five of the interviewees mentioned the Section 504 and 508 requirements of the Rehabilitation Act when asked if there were any laws or regulations for meeting the visually impaired needs. Five of the interviewees also mentioned the American with Disabilities Act. As well three mentioned the IDEA requirements.

When asked if there were formatting preferences, five interviewees responded that 18-20 pt. san-serif typefaces are commonly preferred. APH was also mentioned repeatedly for setting standards in formatting.

When asked if the increasing access to the web has affected the visually impaired population, three of the interviewees responded that special software like ZoomText has made it possible to utilize the web as a resource.

American Printing House for the Blind was commended by two of the interviewees as a successful provider of resources, and was mentioned several other times in interviews for setting formatting standards.

When asked what suggestions there were for improving accessibility, two of the interviewees suggested that publishers release more content to providers of resources for the visually impaired.

It was also mentioned twice during interviews that there is a growing concern nationally that the aging population will greatly increase the number of visually impaired individuals.

Below is a summary of the topics that came up repeatedly among interviewees:

- No, needs are not being sufficiently met (4)
- Needs are met but there are shortcomings (3)
- Resources are expensive (4)
- State funding/ Department of Education funds for resources (5)
- Section 508/504 requirements (5)
- ADA requirements (5)
- IDEA requirements (3)
- 18-20 pt. san-serif commonly preferred (5)
- Use of web: software makes it possible (3)
- APH successful at providing resources (2)
- Publishers responsible for providing more access (2)
- Digital electronic versions of books need to be provided (2)
- Aging population will increase visually impaired population (2)

A data array of all responses can be found in Appendix C. As well, the interviews in their entirety can be found in Appendix D.

<u>Descriptive Research</u>

American Printing House for the Blind (APH):

Brief History-

In 1858 the initial movement to create the American Printing House for the Blind was established. APH became the official supplier of educational materials to students in the U.S.

Mission Statement-

> "The American Printing House for the Blind promotes independence of blind and visually impaired persons by providing specialized materials, products, and services needed for education and life."

The products provided by APH include accessible books and magazines in Braille, large print, recorded, and computer disc formats, educational products, independent living products, production of custom accessible media, such as braille menus. As well they provide an accessible website with online ordering of products, Louis textbook location database, APH File Repository, and Fred's Head tips and techniques database.

The APH accepts federal quota funds, purchase orders from organizations, and check, money orders and major credit cards.

("Museum for the American Printing House for the Blind")

LRS Large Print School Books:

Mission Statement:

> "LRS (Library Reproduction Service) provides Large Print School Books for Visually Impaired and other print-challenged students who are taught in a mainstreamed classroom environment. Our durable hardcover books have been used in schools across the USA for over 35 years."

LRS provides custom LRS Large Print Books which can be ordered using the following specifications: Color or B&W, Paper, Type size, Binding.

The availability of the books depends on whether they are in stock or custom ordered. Any books in the following categories are available: State or Local Editions, Math, Science, or Foreign languages, Old Copyrights, Non-adopted Titles.

Delivery time is 3-4 weeks on average for made-to-order books, 5-10 days for in stock titles. Prices for the books range from $19.95 to $35.95
("LRS Large Print School Books for Visually Impaired Students")

The Clearinghouse for Specialized Media & Translations (CSMT):
Mission Statement-

> "The CSMT mission is to make learning resources and learning environments accessible and meaningful to students with disabilities"

Products provided by the CSMT are alternate formats offered in Braille, large print, audio, and Digital Talking Books. These products are available in the following curricula as provided by Instructional Materials Ordering and Distribution System (IMODS): reading language arts, mathematics, history social-science, science/health, world language, physical education and visual and performing arts.

Costs of these resources can be reimbursed. Reimbursements are available for Braille, Low Vision, and Reader Services for Legally Blind Teachers (Readers Fund). (Paris-Salb)

The following information was provided from the elite and specialized interview with Jan Back of the Tahoe Truckee Unified School District:

> "Clearinghouse for Specialized Media & Translations
> The Clearinghouse for Specialized Media & Translations (CSMT) helps to close
> the achievement gap by providing instructional resources in accessible formats to
> students with disabilities in California. The California Department of Education

(CDE) Clearinghouse for Specialized Media and Translations (CSMT) produces accessible versions of textbooks, workbooks and literature books adopted by the State Board of Education. Products and services are provided pursuant to California law, No Child Left Behind (NCLB) (Outside Source), the Individuals with Disabilities Education Act (IDEA) (Outside Source), the Americans with Disabilities Act (ADA) (Outside Source), and Sections 504 and 508 of the Rehabilitation Act of 1973 (Outside Source).Production and dissemination of materials include braille, large print, recordings, and American Sign Language Video-books are funded by California's Instructional Materials Fund (IMF). CSMT also assists in providing devices such as monoculars to view the curricula. Funds to purchase specialized books, materials, and equipment are provided by the IMF for qualified students with hearing or vision impairments, severe orthopedic impairments, or other print disabilities."

Historical Research:

Section 504 and 508-

Section 504, of the Rehabilitation Act, aims to protect any disabled individual from discrimination in any program or activity that is funded by the federal government. Each federal agency has its own set of accommodations including "effective communication with people who have hearing or vision disabilities".

Section 508 is in place so that any "electronic and information technology" used, developed or maintained by the federal government, is to be accessible to all people with disabilities, both employees and public. For example they provide that "a system that provides output only in visual format may not be accessible to people with visual impairments". ("ADA Home Page")

The following verbiage is from the opening of section 504 and 508 respectively:

"Sec. 504.(a) No otherwise qualified individual with a disability in the United States, as defined in section 7(20), shall, solely by reason of her or his disability, be excluded from the participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance or under any program or activity conducted by any Executive agency or by the United States Postal Service. The head of each such agency shall promulgate such regulations as may be necessary to carry out the amendments to this section made

by the Rehabilitation, Comprehensive Services, and Developmental Disabilities Act of 1978. Copies of any proposed regulation shall be submitted to appropriate authorizing committees of Congress, and such regulations may take effect no earlier than the thirtieth day after the date on which such regulation is so submitted to such committees."

"Web-based Intranet and Internet Information and Applications (1194.22) The criteria for web-based technology and information are based on access guidelines developed by the Web Accessibility Initiative of the World Wide Web Consortium. Many of these provisions ensure access for people with vision impairments who rely on various assistive products to access computer-based information, such as screen readers, which translate what's on a computer screen into automated audible output, and refreshable Braille displays. Certain conventions, such as verbal tags or identification of graphics and format devices, like frames, are necessary so that these devices can "read" them for the user in a sensible way. The standards do not prohibit the use of web site graphics or animation. Instead, the standards aim to ensure that such information is also available in an accessible format. Generally, this means use of text labels or descriptors for graphics and certain format elements. (HTML code already provides an "Alt Text" tag for graphics which can serve as a verbal descriptor for graphics). This section also addresses the usability of multimedia presentations, image maps, style sheets, scripting languages, applets and plug-ins, and electronic forms.

The standards apply to Federal web sites but not to private sector web sites (unless a site is provided under contract to a Federal agency, in which case only that web site or portion covered by the contract would have to comply). Accessible sites offer significant advantages that go beyond access. For example, those with "text-only" options provide a faster downloading alternative and can facilitate transmission of web-based data to cell phones and personal digital assistants." ("Section 508")

Americans with Disabilities Act-

US congress passed the act in 1990. It followed the Department of Rehabilitation's Section 504 and 508 and is the most comprehensive legislation on accessibility. In short- the act provides regulations on access to employment, state and local government programs and services, access to places of public accommodations, transportation, non-profits service providers and telecommunications. ("Mountain State Centers for Independent Living")

Title II of the ADA is of particular importance to people with visual impairments as it fur-

ther protects the rights given to people with disabilities under Section 504 of the Rehabilitation Act of 1973 by State and Local Governments. This means that especially for schools, all aspects must be made accessible to the visually impaired. All curriculum, websites, etc. must comply with ADA regulations. Furthermore, this includes public accommodations, which includes malls, movie theaters, restaurants etc. All entities under the ADA must provide "reasonable accommodation" or be able to prove that any lack of accessibility is necessary for safety or performance reasons. The act in its entirety can be reviewed on the ADA website: www.ada.gov. (Civil Rights Division)

APH formatting standards-

American Printing House for the Blind is considered the leader in providing resources to people with visual impairments. APH is highly regarded in setting formatting standards based on on-going research. The following standards have been suggested by APH based on their research on reading speed, comprehension, literacy, and usability among large print users with visual impairments:

Each large print user should have access to:

1. A font that is at least 18 points in size.
2. X-height and t-heights of at least 1/8 inch.
3. A typeface without serifs.
4. Spacing between lines of print of at least 1.25 spaces.
5. Headings and subheadings that are larger and bolder than regular large print text.
6. Paragraphs that are block style and use 1 inch margins. The left margin should be justified and the right hand margin should not be justified. There should be no first-line indentations to delineate paragraphs.
7. Printed materials with no columns or divided words.
8. Black print on white, ivory, cream, or yellow paper with a dull finish so as not to promote glare.
9. Print that is not used over a background design or other graphical material.
10. Graphics that are not only enlarged, but maintain the same contrast, clarity, and appropriate coloration as those prepared for their sighted peers.

11. Graphic materials, such as maps, graphs, and charts, which also adhere to type size, font, and other large print guidelines. (Guidelines for maps are under development.)

12. Full-color or high-quality black line art rather than gray-scale or shaded drawings.

13. Books that weigh no more than 32 ounces and are no larger in dimension than 9 inches by 12 inches by 2.5 inches.

According to APH, subjects were tested on the various criteria aforementioned (reading speed etc.) and found that all scored higher when using their font APHont. This font was created using they guidelines listed above. (J. Elaine)

CHAPTER 5: CONCLUSIONS

Based on the research conducted on this topic it is clear that standards exist and some needs are being met, but there is room for improvement. Within the state and federal government, the requirements are clear as stated by the interviewees, specifically section 504, 508, and the ADA as well as the formatting standards set by the APH. However defining what suffices as meeting the standards is hard to achieve, as there are so many types of disabilities that are affected differently. Education on the standards as well as the needs of the visually impaired has been limited to governmental agencies and the visually impaired community. These regulations will need to continue to maintain accessibility of content, but also branch out to consumer products and encourage firms to include all types of costumers, such as people with visual impairments.

Because education is part of the state system there are standards and requirements to help students with visual impairments, but the shear cost, as nearly unanimously stated by the interviewees, has caused tremendous pressure on educators to make sure all of their students are learning at the same level. It has also caused shortcomings in districts that simply do not have the funding. APH came out as the clear champion in creating standards for the products adapted for the visually impaired and supplying them to schools with the aid of federal funding.

At hand the biggest problems facing the graphic communication industry and meeting the needs of people with visual impairments are costs and educating designers and publishers on the visually impaired needs. In order to reduce costs, publishers must find ways to increase the volume of content it releases to the visually impaired resource providers. As expressed by the majority of the interviewees, the publishers have been very guarded in releasing content. If they were to increase their volume, prices would go down. As well, digital printing is increasing in popularity and as costs continue to go down, it could also be a possible area of savings for large print publications as the runs are limited and often custom based on the specific needs of people with visual impairments.

In order to solve the majority of dilemmas with web design, designers and web developers must be educated on the needs of the visually impaired and creating their content to compromise between aesthetics and accessibility. The use of screen reading software has also increased the importance of conscientious coding on the part of web developers, in order to include the key content for the software to interpret.

In conclusion, if standards are continually enforced, and the graphic communication industry is educated on the needs of people with visual impairments, including publishers releasing more content for the use of adapted materials, than the needs of the visually impaired will be met with satisfaction.

WORKS CITED

Brown, Rick, ed. "A History of Publishing for People Who Are Blind." History Buff. Web.
15 Feb. 2010. <http://www.historybuff.com/library/refBraille.html>.

Dahlin, Robert. "Large-Print Publishing?A Site for Sore Eyes?" Publishers Weekly. Reed
Business Information, 28 July 2002. Web. 15 Feb. 2010. <http://www.publisher-
sweekly.com/article/432497-Large_Print_Publishing_A_Site_for_Sore_Eyes_.php>.

Guarino, Lauretta, and Gregg Vanderheiden. Web Content Accessibility Guidelines (WCAG)
2.0. Rep. Ed. Ben Caldwell and Michael Cooper. W3C, 11 Dec. 2008. Web. 18 Feb.
2010. <http://www.w3.org/TR/WCAG20/>.

Leibs, Andrew. "Blind Reading Resources-Large Type." (2008). Suite 101. 27 June 2008.
Web. 13 Feb. 2010. <http://blindness.suite101.com/article.cfm/blind_reading_re-
sourceslarge_type>.

Mackenstadt, Denise. "The Role of the Paraeducator in the Education of Blind Children."
National Federation for the Blind. Spring 2002. Web. 17 Feb. 2010. <http://www.
nfb.org/nfb/Default.asp>.

Pilch, Janice T. Treaty for Improved Access for Blind, Visually Impaired and Other Read-
ing Disabled Persons. Issue brief. 12 Oct. 2009. Web. 16 Feb. 2010. <http://www.
librarycopyrightalliance.org/bm~doc/brieftvifinalrev101509.pdf>.

"Section 508 Standards." Section 508. IT Accessibility & Workforce Division (ITAW) Office
of Governmentwide Policy U.S. General Services Administration. Web. 15 Feb. 2010.
<http://www.section508.gov/index.cfm?FuseAction=content&ID=12>.

Levenson, Harvey. Some Ideas About Doing Research in Graphic Communication. Atas-
cadero: Good Neighbor & Services, 2001. Print.

J. Elaine, Kitchel. "APH Educational Research." American Printing House for the Blind.
American Printing House for the Blind, Inc., 26 Mar 2010. Web. 2 Jun 2010.
<http://www.aph.org/edresearch/lpguide.htm>.

"Introduction to the Americans with Disabilities Act (ADA)." Mountain State Centers for
Independent Living. Mountain State Centers for Independent Living, n.d. Web. 2
Jun 2010. <http://www.mtstcil.org/skills/ada1-a.html>.

Civil Rights Division, U.S. Department of Justice . "Americans with   Disabilities Act
Questions and Answers." ADA HOME PAGE. U.S. Equal Employment Opportu-
nity Commission U.S. Department of Justice Civil Rights Division, 14 Nov 2008.
Web. 2 Jun 2010. <http://www.ada.gov/q%26aeng02.htm>.

"Section 504 of the Rehabilitation Act." Section 508. IT Accessibility & Workforce
Division (ITAW) Office of Governmentwide Policy U.S. General Services
Administration, n.d. Web. 2 Jun 2010 <http://www.section508.gov/index.
cfm?FuseAction=Content&ID=15>.

"A Guide to Disability Rights Laws." ADA Home Page. U.S. Department of Justice Civil
Rights Division, 16 Feb 2006. Web. 2 Jun 2010. <http://www.ada.gov/cguide.
htm#anchor66738>

"Our Mission." Museum for the American Printing House for the Blind. American Printing
House   for the Blind, Inc., 02 Jun 2010. Web. 2 Jun 2010. <http://www.aph.
org/museum/museum_mission.html>.

"Options." LRS Large Print School Books for Visually Impaired Students. Library Repro-
duction Service, 2009. Web. 2 Jun 2010. <https://largeprintschoolbooks.com/
choices.html>.

Paris-Salb, John. "Reimbursement Programs." California Department of Education. Califor-

      nia Department of Education, 25 Jan 2010. Web. 2 Jun 2010.   <http://www.

      cde.ca.gov/re/pn/sm/reimburseprogams.asp>.

APPENDIX A

Section 508

§ 1194.22 Web-based intranet and internet information and applications.

(a) A text equivalent for every non-text element shall be provided (e.g., via "alt", "longdesc", or in element content).

(b) Equivalent alternatives for any multimedia presentation shall be synchronized with the presentation.

(c) Web pages shall be designed so that all information conveyed with color is also available without color, for example from context or markup.

(d) Documents shall be organized so they are readable without requiring an associated style sheet.

(e) Redundant text links shall be provided for each active region of a server-side image map.

(f) Client-side image maps shall be provided instead of server-side image maps except where the regions cannot be defined with an available geometric shape.

(g) Row and column headers shall be identified for data tables.

(h) Markup shall be used to associate data cells and header cells for data tables that have two or more logical levels of row or column headers.

(i) Frames shall be titled with text that facilitates frame identification and navigation.

(j) Pages shall be designed to avoid causing the screen to flicker with a frequency greater than 2 Hz and lower than 55 Hz.

(k) A text-only page, with equivalent information or functionality, shall be provided to make a web site comply with the provisions of this part, when compliance cannot be accomplished in any other way. The content of the text-only page shall be updated whenever the primary page changes.

(l) When pages utilize scripting languages to display content, or to create interface elements, the information provided by the script shall be identified with functional text that can be read by assistive technology.

(m) When a web page requires that an applet, plug-in or other application be present on the client system to interpret page content, the page must provide a link to a plug-in or applet that complies with §1194.21(a) through (l).

(n) When electronic forms are designed to be completed on-line, the form shall allow people using assistive technology to access the information, field elements, and functionality required for completion and submission of the form, including all directions and cues.

(o) A method shall be provided that permits users to skip repetitive navigation links.

(p) When a timed response is required, the user shall be alerted and given sufficient time to indicate more time is required.

APPENDIX B

<u>Elite and Specialized Interview Questionnaire:</u>

Name: _____ Organization: _____ Date:_____

<div align="center">Interview Questions</div>

The prompt below summarizes the goal of my senior project research:

This study asks the questions: What are the existing standards and adaptations in place within in the graphic communication industry, specifically publishing, web development and education learning materials, to address the needs of people with visual impairments? How are these needs maintained as far as costs and feasibility? Through researching areas within the industry as well as authorities on standards, this study will deliver what is the current status for people with visual impairments. An important part of the initial research will be to evaluate and summarize the different disabilities that affect vision and the various ways these impairments affect ones ability to comprehend visual information. This study will also research the costs and processes involved in maintaining needs of people with visual impairments in the areas of publishing, education and web development of informational sites. This study will also strive to find potential solutions that the graphic communication industry can provide in order better serve visually impaired individuals. Through emerging technology in digital printing, web development, and desktop solutions the industry can make resources more readily available and affordable.

The purpose of this study is to examine the extent to which the graphic communication industry is addressing the needs of people with visual impairments, and to offer solutions to current or future problems the industry will face in striving to address this population. The findings will provide examples of models that are working within the industry to provide sufficient communication to people with visual impairments, evaluate costs and processes involved in facilitating the needs of people with visual impairments, and the added benefits of including people with visual impairments in the Graphic Communication Industry.

Please answer the following questions in response to my study to the best of your ability. If the question does not apply to your field of study feel free to omit. Please elaborate where needed or ask any further questions for clarification.

1. In your experience- in general, are the needs of people with visual impairments population sufficiently being met by products provided by the Graphic Communication industry? (Publishing- print and web, education, etc)

2. How accessible are alternative publications for the blind and visually impaired in terms of cost, time of production, and availability?

3. What kind of funding does the state or any other entities provide for printing and web resources for people with visual impairments?

4. Are there any laws and regulations on accessibility for visually impaired that apply to the graphic communication products afore mentioned? What has been your experience with these regulations?

5. What are the generally accepted preferences for the various visual impairments in terms of font size, contrast, serif vs. san serif etc. in both print and web?

6. What is your knowledge of web development for people with visual impairments including software for users, specifications for development, laws and regulations etc?

7. What are the daily classroom-needs for the education of (people who are) visually impaired that involve typography, resizing, printing, and binding?

8. Has the increased access to the web for classroom activity affected people who are visually impaired and what are the daily web needs of these students?

9. Are there any areas of success as far as visually impaired resource products, providers or programs within education that you have experience with? How have they met the needs of people with visual impairments so successfully?

10. In your opinion, are there more effective, efficient, and lower-cost alternatives for visually impaired resources? What are your suggestions for improvement?

11. Any other comments, suggestions or questions to contribute to this study?

Thank you for your time and expertise!

DATA ARRAY

	Ann Hinshelwood	Joe Strechay	Dr. Bill Takeshita	John Paris	Elaine Kitchel	Liz Cooper	Jennifer Allen-Barker	Jan Back	Velanche Stewart
1	No, but there has been improvements.	Now more than before, but shortcomings.	Yes but shortcomings.	It depends on the age of user.	No, not at all.	No, but there has been improvements.	No, publishers do not provide sufficient alternatives	Slowly but surely being met.	n/a
2	Increased accessibility through grants from Bookshare and others.	There, but expensive.	Technology is available, too expensive, funding limited.	Expensive and hard to translate math.	Very expensive.	APH and free matter great for grade school, beyond that limited.	In college cost falls to the university, delays can affect students	Very costly to produce but some financial support.	Depends on the type of resource
3	School age have limited state funding from Low Incidence. Beyond that is very limited and timely.	State funding, APH receives state funding as well.	n/a	State funding as well as Low Incidence.	"quota fund." The U.S. Dept. of Education puts aside about $350/ student	See above	University provided	Yearly state allocation of $334 per student with legal blindness. Extra costs include aids, transcribers, paraeducators etc.	Cal Poly funding through departments.
4	State requires publishers to have alternatives, but there is no consistency	508, 504, ADA. Not strongly enforced.	508, National Federation for the Blind.	Education Code, ADA, IDEA, Chafee and Williams.	ADA, relies and Braille Assoc. of North America and APH for standards.	n/a	Section 504 and 508, ADA, IDEA	ADA, NCLB, IDEA, Section 504 and 508	If an industry does business with the federal government or receives funding must comply with Section 508
5	Varies, 18 pt. is most common, comic sans or arial typeface	n/a	n/a	Varies, 20 pt. is common	See APH standards	18-20 pt, black on yellow, san serif	14 pt. min, 18 preferred. High contrast, san serif	18-24 pt. san serif, varies upon impairment.	Important to make web fonts resizable.
6	Enlargement and screen reading software	n/a	n/a	http://www.w3.org/WAI/	Very minimal	Bobby Certification	508 requires accessibility for adaptive software	n/a	Very broad understanding.

DATA ARRAY

#									
7	Depends on the student. Worksheets are enlarged, some negative reaction from students.	Same as classmates. Up to teachers, parents and students to advocate.	Photo-copier/enlarger, Sero-Tech software.	IEP based on their individual needs. Books accessed in Braille or large print, following industry standards.	See APH standards	Textbooks not provided by CDE. Worksheets or units.	Anything provided to the typical student. Powerpoints, white boards etc. also available in large print.	reformat-scan and reduce visual clutter, enlarge, bind, laminate	n/a
8	Students use computers for projects and research. Software like ZoomText and Jaws makes it accessible.	If software is provided than it can be a good resource.	n/a	Software makes it possible.	n/a	Yes, VI students need to be taught access but it is hard to keep up with demands placed on gen. ed. Students.	Needs match what their classmates needs are.	Has enhanced knowledge and independence for students.	The web in the classroom may have an immediate effect. Teachers and departments must make sure to comply.
9	Kurzweil 1000, ZoomText, Jaws, and Window Eyes	APH and NAPVI as well. NFB or ACB	Sero tech, Department of Rehab, Apple-out of the box accessible. Olympus	VI or blind employment is a sign of success.	APH	Anything that provides ease of use.	Dept of Education-recent scholarship funds available	The state school for the blind and the Texas School for the Blind, The American Foundation for the Blind, American Printing House for the Blind, Perkins School for the Blind	Magnification software such as ZoomText, windows as OS X have accessibility widgets.
10	BookShare, RFB&D, and Internet Archives is a free way for students to get books electronically &/ or auditorily.	n/a	Digital versions of books.	Make sure information is disseminated throughout all districts and educators	Designers and print providers need to be educated on the needs. Publishers need to provide more access to lower prices.	Screen access that is easy to use, converts web-sites to text mode and removes pictures.	Publishers need to provide more access.	Everyone involved must continue you to communicate the needs of the visually impaired. Ability to change font size and contrast on website would be helpful.	n/a
11	no	n/a	Due to the aging population, in 30 years majority will be visually impaired due to old age.	n/a	Educate on correct terms, and knowledge of visual impairments	n/a	n/a	n/a	n/a

APPENDIX D

<u>**Elite and Specialized Interview Responses:**</u>
Name: Velanche Stewart__ Organization: Cal Poly; College of Liberal Arts_ Date: 5/25/2010

1. In your experience- in general, are the needs of the visually impaired population sufficiently being met by products provided by the Graphic Communication industry? (Publishing- print and web, special education, etc)
    N/A
2. How accessible are alternative publications for the blind and visually impaired in terms of cost, time of production, and availability?
    It depends on the type of publication and the type of media (ie, book, audiobook, etc.). DRC and the bookstore should have more current info on this.
3. What kind of funding does the state or any other entities provide for printing and web resources for the visually impaired?
    I can't speak for the state, but for the College of Liberal Arts, funding for web resources usually comes from the departments, though funding from CLA is also possible.
4. Are there any laws and regulations on accessibility for visually impaired that apply to the graphic communication products afore mentioned? What has been your experience with these regulations?
    The laws and regulations regarding accessibility will apply to the graphic communications industry if they do business with the federal government, or if they receive funding from the government. In the case of web accessibility and the CSU, for instance, it is required that vendors that the state deals with must have accessible sites with accessible content (ie, documents, descriptive text of images, transcripts of audio, etc.). The sites must adhere to Section 508, an amendment to the Federal Rehabilitation Act of 1973.
5. What are the generally accepted preferences for the various visual impairments in terms of font size, contrast, serif vs. san serif etc. in both print and web?
    Though it's good practice to make fonts readable, it's even more important that visually-impaired users have the ability to resize fonts. Good practice for web design is for the look of the site to be maintained even when font sizes are increased by the user. Also, some make use of screen magnification instead of font enlargement via the keyboard.

    Section 508 guidance on color and contrast for the web can be found here:
    http://warc.calpoly.edu/accessibility/508indepth/color.html

6. What is your knowledge of web development for the visually impaired including software for users, specifications for development, laws and regulations etc?
    I'm unsure if this question is fishing for specifics, but I have a broad understanding of the issues above.
7. What are the daily classroom-needs for the special education of visually impaired that involve typography, resizing, printing, and binding? Has the increased access to the web for classroom activity affected the visually impaired and what are the daily web needs of these students?
    DRC might be best to answer the "classroom-needs" query. Regarding the web's role in classroom use, the effects may be immediate, depending on how documents and site content have been created. Most faculty are still unaware of how its site and/or content may have an impact on visually-impaired students, though most instructors do work with DRC to address such issues on an individual basis.
8. Are there any areas of success as far as visually impaired resource products, providers or programs within special education that you have experience with? How have they met the needs of the visually impaired so successfully?
    Visually-impaired users have access to magnification software such as ZoomText for Windows and VoiceOver for OS X. Also, both Windows and OS X have accessibility widgets built into the operating system, such as menus, the mouse cursor, color-contrast switching, and so forth. DRC would perhaps have more info on other tools and the overall success with the visually-impaired population.
9. In your opinion, are there more effective, efficient, and lower-cost alternatives for visually impaired resources? What are your suggestions for improvement?
    N/A
10. Any other comments, suggestions or questions to contribute to this study?
    N/A

Name: ___Jan Back_____ Organization: _Tahoe Truckee USD_____ Date:__5/16/10____

1.   In your experience- in general, are the needs of people with visual impairments population sufficiently being met by products provided by the Graphic Communication industry? (Publishing- print and web, special education, etc) <u>I feel that the needs of individuals with visual impairments are being addressed slowly but surely. There are folks in the field collaborating with developers of print/graphic materials, web desig and other technologies to heighten awareness about the needs of the VI population and thus, some changes are being made to make print materials more accessible, online, in the classroom and in assistive technology.</u>
2.   How accessible are alternative publications for the blind and visually impaired in terms of cost, time of

production, and availability? Braille/tactile/large print and audio materials are very costly to produce, but there are some financial supports as well as organizations producing materials for school districts and individuals with print disabilities/ challenges in order for them to have access to these learning, leisure or work materials in the suitable format. (Federal govt. quota allocations, Recordings for the Blind and Dyslexic, Benentech Foundation/Don Johnson/Bookshare, National Library Service/WebBraille, State depositories for specialized materials and equipment, lending libraries and/or we also have listserve where we can reach out an borrow " a book" or material that has been created already, grants, community foundations, volunteer groups etc.. Of course there are For Profit companies developing and selling screen reader as well as magnifying software so that students/individuals can have access to the web, email, word processing etc... There are some low cost and free software as well, just not as robust for the the user. Some websites have accessibility features built into their websites to adjust size of font and contrast which can help the visually impaired user.

3.   What kind of funding does the state or any other entities provide for printing and web resources for people with visual impairments? I sort of answered this ? in the above answer. If we have a student with a diagnosis of legal blindness, we get a yearly allocation (about $334 per student) to help us purchase the needed tactile, adapted materials and equipment. Generally the cost for supporting a student who is blind or visually impaired is far more costly as students may have a teacher, an assistant, a Braille transcriber or more than one to address all of the various subjects..one skilled in math and science production, one skilled in literary Braille, on skilled in foreign language production etc..., an Orientation and Mobility Instructor and various other designated instructional services if needed. Although education may be costly, the investment pays off if the student is well equipped to meet the demands of real world and to have a good quality of life.

4.   Are there any laws and regulations on accessibility for visually impaired that apply to the graphic communi-cation products afore mentioned? What has been your experience with these regulations?

  There are several regulations now that help us with getting needed materials for our students. Also thew Department The Americans with Disabilities Act ensures that in public places there are auxiliary aids and services   provided. Here is an exerpt:
A public accommodation must provide auxiliary aids and services when they are necessary to ensure effective communication with indi-viduals with hearing, vision, or speech impairments.

"Auxiliary aids" include such services or devices as qualified interpreters, assistive listening headsets, television captioning and decoders, telecommunications devices for deaf persons (TDD's), videotext displays, readers, taped texts, brailled materials, and large print materials.

The auxiliary aid requirement is flexible. For example, a brailled menu is not required, if waiters are instructed to read the menu to blind customers.

Auxiliary aids that would result in an undue burden, (i.e., "significant difficulty or expense") or in a fundamental alteration in the nature of the goods or services are not required by the regulation. However, a public accommodation must still furnish another auxiliary aid, if avail-able, that does not result in a fundamental alteration or an undue burden.
Publishers have to meet new guidelines as well to make the content more accessible to students with different learning needs providing e-texts files, audio supports etc...

  Here is a great link to our state of California..our portal for specialized media and translations for our school system.http://www.cde.ca.gov/re/pn/sm/ in case there is some info here that could help you.

Clearinghouse for Specialized Media & Translations

The Clearinghouse for Specialized Media & Translations (CSMT) helps to close the achievement gap by providing instructional resources in accessible formats to students with disabilities in California.
The California Department of Education (CDE) Clearinghouse for Specialized Media and Translations (CSMT) produces accessible ver-sions of textbooks, workbooks and literature books adopted by the State Board of Education. Products and services are provided pursuant to California law, No Child Left Behind (NCLB) (Outside Source), the Individuals with Disabilities Education Act (IDEA) (Outside Source), the Americans with Disabilities Act (ADA) (Outside Source), and Sections 504 and 508 of the Rehabilitation Act of 1973 (Out-side Source).
Production and dissemination of materials include braille, large print, recordings, and American Sign Language Video-books are funded by California's Instructional Materials Fund (IMF). CSMT also assists in providing devices such as monoculars to view the curricula. Funds to purchase specialized books, materials, and equipment are provided by the IMF for qualified students with hearing or vision impairments, severe orthopedic impairments, or other print disabilities.

5.   What are the generally accepted preferences for the various visual impairments in terms of font size, contrast, serif vs. san serif etc. in both print and web? To be honest there are many different eye conditions and each child is different in terms of their tolerance for contrast, backgrounds, font size and type; I would contact some of the print companies such as LRS or Imtrek (800-965-PRINT) or Large Print Media (916-924-7200) to ask some technical print questions. Many of our students have loved Arial, some have loved Comic Sans, Century Gothic, Tahoma or ABC Print....and in a minimum of 18 point font for our large print readers up to 24 point font..of course for some instruction. Some of my students like white background/black font. or some like white print on black background. Some like blue with yellow letters/or blue letters on yellow background.

The American Printing House of the Blind also has a font they produce called APHont http://www.aph.org/products/aphont.html

APHont™: A Font for Low Vision

APHont™ (pronounced Ay'-font), was developed by APH specifically for low vision readers. APHont embodies characteristics that have been shown to enhance reading speed, comprehension, and comfort for large print users.
Previously, the APHont Regular portion of the APHont Suite was available free of charge on a PC-formatted floppy disk. This disk has been discontinued, but the entire APHont Suite is now available free of charge on the APH web site. The APHont Suite consists of Regular, Bold, Italic, and Italic Bold. One must certify use for or by a person with a visual impairment before downloading.
Download APHont.
Features:

- More even spacing between letters.
- Higher crossbars.
- No serifs.
- Wider letters.
- Heavier letters.
- Underslung "j" and "q".
- Letters more open.
- Larger punctuation marks.

6.	What is your knowledge of web development for people with visual impairments including software for users, specifications for development, laws and regulations etc? not quite sure..but you can contact the folks that make JAWS (Freedom Scientific), ZoomText (AiSquared), Dolphin and maybe ask Humanware to answer these questions...they are good ideas, my brain is just fried right now..sorry.

7.	What are the daily classroom-needs for the special education of (people who are) visually impaired that involve typography, resizing, printing, and binding? We may need to reformat-scan and reduce visual clutter, enlarge, bind, laminate materials to use in classrooms....design individually for kids' needs.

8.	Has the increased access to the web for classroom activity affected people who are visually impaired and what are the daily web needs of these students? Access to information, computing and the web has increased my students' knowledge base, independence and has helped them be competitive with their sighted peers.

9.	Are there any areas of success as far as visually impaired resource products, providers or programs within special education that you have experience with? How have they met the needs of people with visual impairments so successful? There are so many good resources, programs and providers that have been successful meeting the needs of their students with visual impairments. Each team of folks serving individuals with visual impairments has tried to become aware of the individual, learning strengths and needs...then determine the necessary supports that they will need to become the best that they can be, succeed in this competitive world of work and live as independently as possible. Once the team of folks figures these things out..then they network with the variety of the resources, programs and providers to facilitate this growth and development of skills. The state school for the blind and the Texas School for the Blind have great resource lists...there are so many more...The American Foundation for the Blind
, American Printing House for the Blind, Perkins School for the Blind are all good resources...here are a few links..

http://www.afb.org/
http://www.csb-cde.ca.gov/important_blindness_related_links.htm

http://www.tsbvi.edu/othersites.htm

10.	In your opinion, are there more effective, efficient, and lower-cost alternatives for visually impaired resources? What are your suggestions for improvement? Things are changing and more and more is available to help folks with VI. I think that it is important for all of the powers that be (i.e the publishers, the school personnel, web designers, the consumers, support folks, developers etc..) continue to discuss the needs of the visually impaired in this fast paced technological world so that they can develop suitable items and employ strategies to meet those needs.

Some of the changes that I do see that have helped is embedding the ability to change font size, contrast etc...on websites would be awesome. I think that embedding accessbility features within the hardware and software of mainstream techonlogy would be awesome...even though that cuts into some of the market share for some companies. I do hope that there will be better OCR software to be able to read a variety of scanned materials so that we can adapt learning materials for our students. Continue to be creative and think outside of the box... to make accessible visual, auditory, tactile and olfactory learning materials...etc...

11.   Any other comments, suggestions or questions to contribute to this study? great idea..so glad you are considering the needs of visually impaired folks...

-

Name: _Joe Strechay_____ Organization:American Foundation for the Blind_____
Date:_May 5, 2010

1.   In your experience- in general, are the needs of the visually impaired population sufficiently being met by products provided by the Graphic Communication industry? (Publishing- print and web, special education, etc)

I would say more so now then prior, but I would not say equally. I would say as web technology progresses with more graphical representation, the technology that allows us to access these sites, can typically not. Well, not unless the designers specifically consider the neads of persons using screen reading software. Most graphic designers do not consider or truly understand accessibility. AFB Consulting has a program called AAP program, Accessibility Assurance Program that helps them to make sure that their site is accessible. Information can be found through AFB.org. Through such sites as bookshare.org, written publications are becoming more accessible to persons with visual impairments. RFB&D would be another organization that is helping persons with visual impairments to also access books and such. I will also mention the National Library Service as well, they also provide books in accessible format. Technology has opened a lot of doors in this area. As for newspapers, there is NFB's Newsline which allows persons with visual impairments to access news papers via the phone, I believe it is around a hundred newspapers. If companies producing products that allow us to access e-publishing do not take persons with visual impairments into consideration, then we will be left behind. Apple, Lexmark, Google, Microsoft & others are really striving to allow access to all. Apple has come from the bottom to the top in the last few years in terms of accessibility. Their systems are almost accessible out of the box. You should check out AccessWorld which is a free online publication from AFB that evaluates technology, including mainstream technology. It can be found thorugh AFB.org.

2.   How accessible are alternative publications for the blind and visually impaired in terms of cost, time of production, and availability? Pretty accessible, but the cost comes in with the technology typically used to access those materials. Check out the cost of the Victor Stream, Bookport and such. You have to get a memebership to an organization like bookshare and have these devices unless you run it through your computer.

3.   What kind of funding does the state or any other entities provide for printing and web resources for the visually impaired?

States have funding for productions of materials for the schools, if that is what you mean. They have Instructional Material Centers. You should also look into NIMAS which is a national repository of electronic text and such for the schools. These centers utilize this to get electronic formats to produce braille versions of textbooks and more. You may also want to look into federal quota funds that are allotted to school districts to purchase materials such as books and such. These funds can be utilized to purchase materials from such organizations as the American Printing House for the Blind, based out Louisville, KY. They are known as APH.

4.   Are there any laws and regulations on accessibility for visually impaired that apply to the graphic communication products afore mentioned? What has been your experience with these regulations?

508 – compliance is something you should look into, these are standards set by the federal government on accessibility. I am sure you have looked at ADA law and compliance standards though. 504 are other standards, but 508 would be the standards related to your question. I would say they are not really enforced at this point in time. I worked at a state government level in Florida and we helped other state agencies with web compliance/accessibility. Many are not accessible.

5.   What are the generally accepted preferences for the various visual impairments in terms of font size, contrast, serif vs. san serif etc. in both print and web?

I would leave this to the others.

6.   What is your knowledge of web development for the visually impaired including software for users, specifications for development, laws and regulations etc?

I will leave this to the others. Make it accessible… haha…

7.   What are the daily classroom-needs for the special education of visually impaired that involve typography, resizing, printing, and binding? Has the increased access to the web for classroom activity affected the visually impaired and what are the daily web needs of these students?

They need to have the same access as their classmates, but it is up to the parents, teachers, and students to advocate for that. This can be met in multiple ways, by providing accessible software on the computers or a computer or on a personal computer that they would be loaned while in school. You should contact your Dept. of Education for their opinion. I can tell you mine from what standards we set at the state level in Florida. But, the counties have to follow these state board rules or even ADA. Again, but, there has to be some follow up and accountabilities. Most state board rules do not have much accountabilities or penalties. They might have limits on future funds by not meeting IDEA standards. You should look at IDEA as well, oversees ADA for the schools. Their funds for special education are IDEA funds.

8.   Are there any areas of success as far as visually impaired resource products, providers or programs within special education that you have experience with?

Contact APH and NAPVI as well. NFB or ACB would be a good organization too.

How have they met the needs of the visually impaired so successfully?

APH, I have mentioned that they provide materials that are specific to visual impairment. NIMAS again.

9.   In your opinion, are there more effective, efficient, and lower-cost alternatives for visually impaired resources? What are your suggestions for improvement?

10.   Any other comments, suggestions or questions to contribute to this study?

I put a lot of references that you should look into while putting this together. Hope it helps.

Name: Ann E. Hinshelwood

Organization: Nevada County Superintendent of Schools, Special Education Services
Date: May 12, 2010

1.   In your experience- in general, are the needs of people with visual impairments population sufficiently being met by products provided by the Graphic Communication industry? (Publishing- print and web, special education, etc) No, they are starting to provide greater access to textbooks and novels. However, access to the internet requires specialized software to enlarge the screen/font.

2.   How accessible are alternative publications for the blind and visually impaired in terms of cost, time of production, and availability? There is increased accessibility due to grants provided by BookShare and Recordings for the Blind and Dyslexic. Also, Internet Archives also provides free electronic books and music.

3.   What kind of funding does the state or any other entities provide for printing and web resources for people with visual impairments? School-aged students have low incidence funding provided by the State. It covers the purchase of specialized materials, including technology, braille materials, large print material, etc. The monies are limited, so when it runs out you are out of luck. Other resources are limited and require too much time on the VI teacher's part to hunt for funding.

4.   Are there any laws and regulations on accessibility for visually impaired that apply to the graphic communication products afore mentioned? What has been your experience with these regulations?
The State has worked with textbook publishers to ensure that they provide alternative formats of their books. Unfortunately, there's no consistency with how they provide the formats. If they could all provide CD's for our students, it would make textbooks more accessible. Also, it would allow the VI staff to quickly order books on CD so they would be available faster to students. Now, our TA's call publishers and try to hunt down what's available. If an electronic version is not available, then we go through listservs to find what we need.

5.   What are the generally accepted preferences for the various visual impairments in terms of font size, contrast, serif vs. san serif etc. in both print and web? There's not a definite size of font as it depends on the student's visual impairment. If a student needs anything larger than 18 point font, we usually have them working with an electronic document on their laptops or BrailleNotes. We often use Comic Sans or Arial font enlarged around 18 point for our books.

6.   What is your knowledge of web development for people with visual impairments including software for users, specifications for development, laws and regulations etc? Not familiar, except enlarging and screen reading software.

7.   What are the daily classroom-needs for the special education of (people who are) visually impaired that involve typography, resizing, printing, and binding? It depends on the age of the student, their academic level and if they are computer literate. We ask teachers to give us lists of books needed throughout the year, ASAP!!! Unfortunately, we often get last minute calls for books. Some schools enlarge worksheets for our students while others require us to enlarge. Some students do not like to look different from their peers, which results in them not using enlarged materials. They tend to take longer reading.

8.   Has the increased access to the web for classroom activity affected people who are visually impaired and what are the daily web needs of these students? Students use the classroom or lab computers for projects and research. If the student is willing to use adapted software(ZoomText, Jaws, Window Eyes, etc), then the software gets installed on their classroom and lab computers. Students who have their own laptops can use them for class work. We make sure that students with laptops or BrailleNotes have access to the wireless internet.

9.   Are there any areas of success as far as visually impaired resource products, providers or programs within special education that you have experience with? How have they met the needs of people with visual impairments so successfully? Kurzweil 1000, ZoomText, Jaws, and Window Eyes are all programs that allow our students access to electronic books, the internet and general computer access. ZoomText is frustrating for students who have more vision as they don't like their computer screen area reduced.

10.   In your opinion, are there more effective, efficient, and lower-cost alternatives for visually impaired resources? What are your suggestions for improvement? Using BookShare, RFB&D, and Internet Archives is a free way for students to get books electronically &/or auditorily.

11.   Any other comments, suggestions or questions to contribute to this study? No

Name: _____Jonn Paris-Salb, Education Administrator I
Clearinghouse for Specialized Media & Translations_____ Organization:_____
Date:_____

1. In your experience- in general, are the needs of the visually impaired population sufficiently being met by products provided by the Graphic Communication industry? (Publishing- print and web, special education, etc)
   The answer depends on the age of the student. For the young student learning braille there are many tools to teaching the literary skills. Materials are generally available to K-8 students. As the students progress through the grades the books become more complex and longer. Those needing large print are usually accommodated, but the number of volumes is hard to manage in searching for information (glossaries, atlas volume, and appendices). For braille readers the number of volumes increased by 3-6 times the print page, especially for math and science. Electronic files (scanned OCR pages, publisher files, NIMAS and other file formats are available and used on various devices) are becoming more widely used. Depending on the learning tools used, and technology support available, the students may be able to access more if the teacher is technology-knowledgeable, and less if that is not the case. Most Web information in recent years is accessible, and more so if the student uses software that reads it well (JAWS or other screen readers).

2. How accessible are alternative publications for the blind and visually impaired in terms of cost, time of production, and availability?
   Braille is expensive, and there are few transcribers that can provide braille in math (Nemeth is a special certification for math and science braille guidelines and few have earned that certification). It is more available in public schools, and in programs where there are several VI students and a person is hired to provide braille on a daily basis for daily work.

3. What kind of funding does the state or any other entities provide for printing and web resources for the visually impaired?
   California provides funding for students in K-12 for accessible materials. K-8 students have board approved adopted materials converted to multiple formats. High school has local adoptions and due to recent legislation have lumped funding together so there is no longer a reimbursement special account. Districts are still expected to provide what a student needs. Private schools are not under the same expectations, nor funded for that expectation. There is also money distributed through Low Incidence to the regions (SELPA) that can provide accessible support. New emerging technologies include electronic files and these are becoming more accessible for all students with print disabilities.

4. Are there any laws and regulations on accessibility for visually impaired that apply to the graphic communication products afore mentioned? What has been your experience with these regulations?
   Yes, Education Code requires that materials be made available in accessible formats. Publishers are mandated by education code to provide files if they do not provide the access formats to the state. Other legislation such as ADA, IDEA, Chaffee, and Williams support the requirements of providing accessible materials to students with disabilities.

5. What are the generally accepted preferences for the various visual impairments in terms of font size, contrast, serif vs. san serif etc. in both print and web?
   Each student with disabilities has an Individual Education Program (IEP). This means the tools for each student are based on what the individual needs, not one plan for all. For large print the norm is font size 20 and materials in color. Most computers have internal capability to change font and contract as well as fonts. Web sites vary, but most can be accessed with software specifically designed to read site information on the Web. Not all have metadata to read descriptive information, and none have this feature unless it was provided initially so that a screen reader or other software could access it.

6. What is your knowledge of web development for the visually impaired including software for users, specifications for development, laws and regulations etc?
   I would refer you to the information at http://www.w3.org/WAI/ which is an industry standard for provided access to persons with print disabilities.

7. What are the daily classroom-needs for the special education of visually impaired that involve typography, resizing, printing, and binding? Has the increased access to the web for classroom activity affected the visually impaired and what are the daily web needs of these students?
   As I mentioned earlier each students has an IEP based on their unique needs. If a physical book is needed, large print or braille, there are industry standards for volume size and accessible features. If the materials are provided electronically there are software applications that assist in the provision of the curricula in setting for the individual.

8. Are there any areas of success as far as visually impaired resource products, providers or programs within special education that you have experience with? How have they met the needs of the visually impaired so successfully?
   For success information you could look at matriculation rated for graduation. Another source of celebration is college attendance, career information. You will find many examples of under-employed students, but you will also find doctors and lawyers, athletes, and artisans. Every industry has blind mentors and aspiring students to break into new professions daily. The important factor is what defines success to the individual and to the community in which they live. Are you looking at VI or blind, are you also looking at other disabilities that the individuals are challenged with? It is difficult, and becoming more so to find highly trained TVI and OM specialists for students in more remote areas, as ell as low enrollment in credential programs for VI specialties.

9. In your opinion, are there more effective, efficient, and lower-cost alternatives for visually impaired resources? What are your suggestions for improvement?
   New technologies are being developed all the time. The new NIMAS files were developed specifically to get braille in the hands of students more readily. The Don Johnston product, ReadAloud6, can take the NIMAS files and play it with accessible features in a seamless manner. Companies such as this will bring access to students who did not have this three years ago. The same is true of many other tools and devices to allow for independence and serving unique needs of the blind. By the same token, improvements for the blind generally include Universal access which benefits all learners and users. We need to have a better way to disseminate information to educators in the field, as often they are isolated in a district and do not receive updates as they could.

Name: Dr. Bill Takeshita Organization: Center for Partially Sighted, Director of LV services
Date:4.22.2010

1. In your experience- in general, are the needs of people with visual impairments population sufficiently being met by products provided by the Graphic Communication industry? (Publishing- print and web, special education, etc)   Yes, but there are shortcomings
2. How accessible are alternative publications for the blind and visually impaired in terms of cost, time of production, and availability? Technology is there for educational materials, funding is the issue. Schools are stuck using old equipment.
3. What kind of funding does the state or any other entities provide for printing and web resources for people with visual impairments?
4. Are there any laws and regulations on accessibility for visually impaired that apply to the graphic communication products afore mentioned? What has been your experience with these regulations? Section 508, National Federation for the Blind, seeks to find cases of insufficient accessibility. Lawsuit against Target Corp. for their online store, as well as recent issues with Kindle. Publishers are against released audio version of the book along with the PDF version.
5. What are the generally accepted preferences for the various visual impairments in terms of font size, contrast, serif vs. san serif etc. in both print and web? N/A

6. What is your knowledge of web development for people with visual impairments including software for users, specifications for development, laws and regulations etc? N/A

7. What are the daily classroom-needs for the special education of (people who are) visually impaired that involve typography, resizing, printing, and binding? Parents rely on itinerate teacher, photo copier enlarger, Sero-Tech – software free to K-12, reading aloud. System Access to-go.

8. Has the increased access to the web for classroom activity affected people who are visually impaired and what are the daily web needs of these students? N/A

9. Are there any areas of success as far as visually impaired resource products, providers or programs within special education that you have experience with? How have they met the needs of people with visual impairments so successfully? Microsoft is moving that way. Low Vision: Sero tech, Human-ware foundations: Change-a-like $7,500 tech. for students. Department of Rehab provide technology for 16+. Apple- out of the box accessibility for consumer goods. Also Olympus.

10. In your opinion, are there more effective, efficient, and lower-cost alternatives for visually impaired resources? What are your suggestions for improvement? Digital version of books, NLS- free RFBD is free books, bookshare.org.
11. Any other comments, suggestions or questions to contribute to this study? For companies to understand, that because of the aging population in less than 30 years the majority of the population will be visually impaired due to old age.

Name: _Elaine Kitchel_____ Organization: American Printing House for the Blind_____ Date:___4/26/10___

1. In your experience- in general, are the needs of the visually impaired population sufficiently being met by products provided by the Graphic Communication industry? (Publishing- print and web, special education, etc)
No, not at all. There seems to be very little interest, and what interest exists, leads to false conclusions by people who mean well but do not understand how persons with visual impairments see. These people overlay their experience as sighted people as they make judgments about what persons with visual impairments need. Most of the time they are incorrect in their conclusions. The only print publications that I know of that are truly accessible come from the American Printing House for the Blind, the American Foundation of the Blind, the New York Lighthouse, the Lutheran Bible publishers, the U.S. Parks Service, and LRS publishers. And even among these publishers, sometimes texts that are in large print, but are not truly accessible are produced. Accessibility means much more than text enlargement.
2. How accessible are alternative publications for the blind and visually impaired in terms of cost, time of production, and availability?
Appropriate large format books are very expensive. At APH the production is underwritten by the U.S. Dept. of Education, but other publishers must rely on donations from the public to fund their efforts, or must sell the books for a profit.
3. What kind of funding does the state or any other entities provide for printing and web resources for the visually impaired?
Most large format books produced for students, are funded by something called the "quota fund." The U.S. Dept. of Education puts aside about $350 for each child with a visual impairment. It assigns trustees in each state to spend the money at the American Printing House for the Blind to purchase books and other educational materials for students with visual impairments. These purchases include both Braille and large format textbooks.
Sometimes individual states purchase materials using their own funds, but mostly quota funds are used.

4. Are there any laws and regulations on accessibility for visually impaired that apply to the graphic communication products afore mentioned? What has been your experience with these regulations?

As far as I know the regulations, known as the "Americans with Disabilities Act" specifies the law that reading materials must be made accessible, but it relies on the Braille Association of North America to set the standards for Braille, and it relies on the American Printing House for the Blind, and other agencies serving people with visual impairments and low vision to set the accessibility standards for large format text.

5.   What are the generally accepted preferences for the various visual impairments in terms of font size, contrast, serif vs. san serif etc. in both print and web?

You may find concise and clear answers to your above question at: http://www.aph.org/edresearch/lpguide.htm
Also, "Guidelines for the Development of Power Point (and web) Presentations" click on this link from page http://www.aph.org/edresearch/

6.   What is your knowledge of web development for the visually impaired including software for users, specifications for development, laws and regulations etc?

I happen to know quite a bit about it because I did the research and developed many of them.
For your questions about accessible software, and specifications for accessibility, you need to talk to Larry Skutchan at (800) 223-1839 ext: 314
For questions about accessible web development, you need to talk to Mike McCarty at (800) 223-1839 ext: 396
There is very little in the way of regulation or laws governing the accessibility of the web and software.

7.   What are the daily classroom-needs for the special education of (people who are) visually impaired that involve typography, resizing, printing, and binding?
See http://www.aph.org/edresearch/lpguide.htm it has all the answers.
Has the increased access to the web for classroom activity affected the people who are visually impaired and what are the daily web needs of these students?
Again, ask Mike McCarty, number is above.

8.   Are there any areas of success as far as visually impaired resource products, providers or programs within special education that you have experience with? How have they met the needs of the visually impaired so successfully?

As far as I know, the American Printing House for the Blind has the most experience with providing accessible materials to students. They have been successful because they have devoted time, money, and research in an effort to find out what does and does not work in print and graphics for people with visual impairments.

9.   In your opinion, are there more effective, efficient, and lower-cost alternatives for visually impaired resources? What are your suggestions for improvement?
First of all, the graphics and printing community need to study what is already out there and what guidelines have been developed by people who are visually impaired and those who work with them. My experience has shown that most graphic designers think they know best what works for people with visual impairments and they are quite certain that the principles they learned in college apply to everyone. THIS IS NOT THE CASE. But they seem unwilling to learn anything new, so the fonts and documents they produce are not accessible, even though they may be bigger. Often they rely on an old study from the 50's that tried to show that fonts with serifs "lead the eyes from one word to the next." This has been shown to be rubbish, but often those who have relied on that piece of flawed research cling to it even in the face of newer and better-designed research. APH has developed a free font called APHont for persons with visual impairments and yet most publishers refuse to use it even for audiences of people with visual impairments because the sighted publishers do not like it. If accessible large format documents were made in quantities by publishers, the prices would go down. With the baby boomers reaching the age at which the vision starts to deteriorate, publishers will be faced with this dilemma, yet most are very reluctant to embrace any accessibility options. My suggestion is the publishers at least read what has been developed by experts in vision regarding large format documents. That would be a start.

10.   Any other comments, suggestions or questions to contribute to this study?
It is good to see someone tackling these questions. I suggest you follow up on the links and people I've highlighted above, and if you still have questions, get back to me. ekitchel@aph.org
I have a comment as well. If you are going to ask people like me in the community of people with visual impairments to answer a questionnaire, it would be helpful if your questionnaire were in an accessible format. It is not. I have reformatted the questionnaire so that I could use it. I submit it to you as an example of an accessible document. Also, you have referred to "the visually impaired." This is a usage that will get you into trouble if you use it with people who are visually impaired. The correct usage is to say "people with visual impairments." Put "people" first.

Name: ____Liz Cooper_____ Organization: ___YCOE___ Date:____5-12-10__

1.   In your experience- in general, are the needs of people with visual impairments population sufficiently being met by products provided by the Graphic Communication industry? (Publishing- print and web, special education, etc)
No, there are some areas that have been addressed, for example, Braille on bathroom doors and access to ATMs, but there are few

adaptations in the general population. Blind people use accessible software to navigate the web using a text based approach, but it takes special training and skill to learn to use the software and navigate the internet.

2. How accessible are alternative publications for the blind and visually impaired in terms of cost, time of production, and availability?

Access is great through free matter and APH in grade and high school. After that, services are few except for Braille and Talking Book library and resources through Dept. of Rehab and higher education.

What kind of funding does the state or any other entities provide for printing and web resources for people with visual impairments? See above.

3. Are there any laws and regulations on accessibility for visually impaired that apply to the graphic communication products afore mentioned? What has been your experience with these regulations? Not to my knowledge. Some entities provide large print, like UCD Medical Ctr. When it comes to eye reports. There are some books published in large print.

4. What are the generally accepted preferences for the various visual impairments in terms of font size, contrast, serif vs. san serif etc. in both print and web?
18-20 point font, black on yellow, arial or other fonts that are without serifs.

5. What is your knowledge of web development for people with visual impairments including software for users, specifications for development, laws and regulations etc? I know a blind user who has made her own website. She does ask for sighted input. There is no product that I am aware of that helps blind people make websites. There is the Bobby certification for blind user friendly websites.

6. What are the daily classroom-needs for the special education of (people who are) visually impaired that involve typography, resizing, printing, and binding? Usually textbooks that are not provided through the CDE. Sometimes worksheets or units for specific general ed teachers and subjects.

7. Has the increased access to the web for classroom activity affected people who are visually impaired and what are the daily web needs of these students?
Yes. VI students need to be taught access technology and it is difficult because of the demands placed on students in gen ed.

8. Are there any areas of success as far as visually impaired resource products, providers or programs within special education that you have experience with? How have they met the needs of people with visual impairments so successfully?
Ease of use is big. Something that requires a lot of training takes time and effort, something that is in short supply in the gen ed environment.

9. In your opinion, are there more effective, efficient, and lower-cost alternatives for visually impaired resources? What are your suggestions for improvement? Make a screen access program that is easy to use, that requires little training. Make websites easy to access by turning on text mode and deleteing pictures.

10. Any other comments, suggestions or questions to contribute to this study?

Name: Jennifer Allen-Barker Organization: Cal Poly DRC Date: 5-17-10

1. In your experience- in general, are the needs of people with visual impairments population sufficiently being met by products provided by the Graphic Communication industry? (Publishing- print and web, special education, etc)
    No, textbook publishing still does not meet the needs of students with VI, by not providing accessible alternate format, which means the university or other non-profit agencies must create from scratch the audio or large print or Braille material, usually causing a delay in the material being available to the student. Additionally, many websites still do not have websites fully compatible with commonly used screen enlarging and reading software, even websites selling products to persons with VI.

2. How accessible are alternative publications for the blind and visually impaired in terms of cost, time of production, and availability?
    Cost, for persons in college, the university is responsible for providing the student with alternative format materials at no cost (beyond the student's original purchase of the textbook). Time of production: since the university frequently must seek alt format of the text from sources beyond the publisher, delivery time to the student may take up to two weeks. If the instructor does not select the text and notify the campus bookstore until just before the quarter starts, this means the student will not get their alt format text until after the quarter has started. Availability: (see above)

3. What kind of funding does the state or any other entities provide for printing and web resources for people with visual impairments?
    See response in #1 above)

4. Are there any laws and regulations on accessibility for visually impaired that apply to the graphic communication products afore mentioned? What has been your experience with these regulations?
    The Rehab Act of 1973, especially sections 504 and 508, the Americans with Disability Act or 1990, and the IDEA all apply. The Rehab Act and the IDEA both cover information technologies and require that information be as available to persons with disability as to the general population in the education setting, at no additional cost to the persons with disability. Considering how long those laws have been in effect, it's amazing to me that we are still

so limit in our ability to provide these materials readily, and that we are still producing so much from scratch, that is, there is no clean word doc or pdf coming from the publisher that can be downloaded and reproduced in alt format without significant clean up being done by university staff. Sometimes the supposed accessible doc from the publisher is so bad; staff has to start by scanning the textbook and converting from that point rather than from the provided download from the publisher.

5. What are the generally accepted preferences for the various visual impairments in terms of font size, contrast, serif vs. san serif etc. in both print and web?

> High contrast; sans serif; capital letters and small letters used as appropriate; minimum large print is 14 point font, but many persons have preference of larger, such as 16 or 18 point font. After those sizes, the size of paper amount of information on each page becomes more difficult, so magnification is used.

6. What is your knowledge of web development for people with visual impairments including software for users, specifications for development, laws and regulations etc?

> I know that section 508 of the Rehab Act requires accessibility by typically used adaptive software, such as JAWS, Zoomtext, MagicEyes, and Kursweil 1000. I don't know what software are used to develop web sites that are accessible, or what software are used to assess accessibility.

7. What are the daily classroom-needs for the special education of (people who are) visually impaired that involve typography, resizing, printing, and binding?

> Any print material provided to the typical student must be provided to the student with visual impairment. Additionally, any printed material presented on power point, white boards and chalkboards, should also be provided in print to these students, in my opinion. Otherwise, they are at a disadvantage of not seeing what their classmates see.

8. Has the increased access to the web for classroom activity affected people who are visually impaired and what are the daily web needs of these students?

> Whatever their classmates" needs are

9. Are there any areas of success as far as visually impaired resource products, providers or programs within special education that you have experience with? How have they met the needs of people with visual impairments so successfully?

> In the past 2 years, the federal government, through the Dept of Education, has made monies available as "scholarships" to Recording for the Blind and Dyslexic, and another non-profit, so they can offer their services for free. They provide professionally produced audio textbooks for persons with print disability. If they have created the text needed by a student already, their product is available within minutes as a download. Thus, the student needing alt format has it within minutes of their request. Unfortunately, their library of materials is still limited, especially in the STEM, and while they can create materials on request, it takes up to 3 months…not effective for a university student, unless they can somehow wangle that information from an instructor one to two quarters in advance of taking the class.

10. In your opinion, are there more effective, efficient, and lower-cost alternatives for visually impaired resources? What are your suggestions for improvement?

> Since everything is developed electronically already, I think the publishers should be making the accessible product.

11. Any other comments, suggestions or questions to contribute to this study?

APPENDIX D

APPENDIX A

APPENDIX B

APPENDIX C