

Title:           The World Wide Web as an Information Resource for the Deaf  
                  Community

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Abstract

This paper looks briefly at the phenomenon of publishing on the World Wide Web, particularly with regard to its stabilization, and its effect on the concept of comprehensive collection building; and then, focuses on deaf-related information. Using a variety of search tools, the author finds more than 100,000 documents related to deafness and deaf culture on the web and demonstrates a means for tailoring a search to focus on various aspects of available information, specifically either the traditional medical and disability/handicap emphasis of information about deafness or the sociological/cultural emphasis on deaf people. One additional search method used commercial software which automatically combines the searches of the standard search tools and generates various indexes; and, finally, the paper also looks at 2 types of web-based attempts to organize deaf-related information.

## **1.0) Introduction**

### **1.1) Background**

Established in 1864 and located in Washington, DC, USA, Gallaudet University is the only 4-year liberal arts university for deaf people in the world. The University, funded by Congress, has as its primary mission the education of deaf and hard-of-hearing United States nationals; however, up to 10% of its student population comes from countries all over the world. The Gallaudet University Library serves all of the traditional information and research needs of its faculty and student populations as does any other college or university library. However, this library has also developed the world's premier collection of materials on deafness and deaf culture. It has a comprehensive Deaf Collection development policy requiring the subscription to every deaf-related periodical known in the world and the purchase of at least one archival and one circulating copy of every deaf-related book regardless of language, excepting those in the case of both journals and books dealing primarily with the medical aspects of hearing loss. With over 500 periodical titles and nearly 85,000 volumes, Gallaudet's Library Deaf Collection is unrivaled by any other collection anywhere in the world.

Understandably, the University, its faculty, students, alumni and deaf people everywhere have been proud of this special collection devoted to deaf people and deaf culture and the Library has long recognized its role combining the development, promotion, and preservation of this unique collection. All along, a central feature of this collection has been that it is comprehensive, i.e., that, as reasonably close as possible and within the scope laid out in the previous paragraph, this collection contained every book and journal on deafness and deaf culture known to the Library staff. However, within the past 3 to 5 years, a new medium of information storage, retrieval, and dissemination has emerged and grown to enormous proportions. For many years, the Internet functioned as a vehicle of information and file exchange solely among the government and high-level researchers. However, with the development of the World Wide Web (WWW), electronic information on all subjects has grown at an astounding rate. Information on deafness and deaf culture has been no exception and, indeed, may be growing at a particularly fast rate because of particular suitability of the WWW as a communication medium among deaf people.

Libraries everywhere are working to understand the nature of information "on the web," i.e., on the WWW, and to determine what role they have in relation to such information. At Gallaudet, the Library is facing this same issue both in terms of information in general on the web and, in particular, information related to deafness and deaf culture. This paper briefly addresses issues related to information on the WWW and then will look specifically at the scope and characteristics of the web's deaf-related information, particularly as a resource for the deaf community.

## **1.2) Information Technology**

Traditionally, information available on any subject occurred in the form of books and journals. The scholarly and publishing communities controlled what was selected for publishing through processes of peer review, dissemination of scholarly information, and determination of what would be profitable to publish. In that way, libraries had a limited universe of materials to choose from in order to develop their collection on any chosen subject. The books and journals available had already passed through one to several review stages and the library's own review and selection process further ensured that information found in the library at least constituted "good thinking." Once the library ensured that its selection process resulted in an unbiased collection on any given subject and that it was as comprehensive as budget allowed, it could rest assured that it had done its job.

At first, advances in information technology permitted only the faster production and publication of more books and journals. Although libraries struggled to keep up, they eventually realized that they, at least the major research libraries, could no longer attempt to maintain comprehensive research collections in all subject areas. The notions of specialization and cooperation grew into acceptance and, through them, libraries found new ways to share and move the increasing volume of books and journals and still fully serve their clientele. Currently, however, new technology has given birth to a new information medium which coexists with the book and journal as media of information exchange.

The World Wide Web was made possible by the convergence of 2 areas of technology; (1) the development of hypertext software which organizes and links information of any kind, and (2) major advances in the ability to store and quickly transmit large amounts of information. The combination and refinement of those two advances quickly allowed for a new form of publishing since anyone with access to the Internet could put together a document combining text and graphics and store it in a file accessible to other people who also had access to the Internet. That document, even with its large graphics, could be easily and quickly accessed anywhere in the world; and, very importantly, it could be connected to other documents or other documents connect to it by a new form of referencing. This new referencing, or "hot linking" or just "linking" as it is called, not only allowed one document to be cited by another; but, by using the computer's "mouse" pointing device, pointing to the citation would instantly jump the user to the cited document, which might point to another and yet another giving rise to the visualization of this network as a spider's web and, hence, the terms "World Wide Web," WWW, and the web, all of which are used interchangeably to mean the same thing.

Initially, many people saw the web only as a novelty because, although the information one could find on the web was colorful, much of it lacked important content. And, since anyone who put information on the web could also take it off, much of what was able to be found one day, was gone the next. However, individuals, corporations, and institutions

everywhere quickly learned that the web had a tremendous potential for storing and disseminating information much more effectively and inexpensively than the traditional methods and the web began to mature as a serious information and research resource. The expression, “information explosion” has certainly been overworked; yet, it does describe the volume increase in information on the web in just the past 2 to 3 years.

## **2.0) Deafness and Deaf Culture Resources**

Certain areas of information, however, have grown faster than others for a variety of reasons. Information about computers, computing, hardware and software has grown much faster than, for example, information about gardening. Although no studies have been done comparing the rates of growth and breadth of coverage by subject area on the web, it appears that there may be an unusual wealth of deaf-related information. If that is true, there may be a few readily identifiable, potential causes. In many areas of the world, there has been an increased emphasis on the rights of minority groups. Likewise, there has been a similar growth in the focus on the rights of and accommodations for persons with disabilities. Consequently, deaf people have received attention from both angles since deafness has been traditionally viewed as a disability; and, recently deaf people have been increasingly recognized as a cultural minority, due in part because of the recognition, in many countries, of sign language as a distinct cultural language.

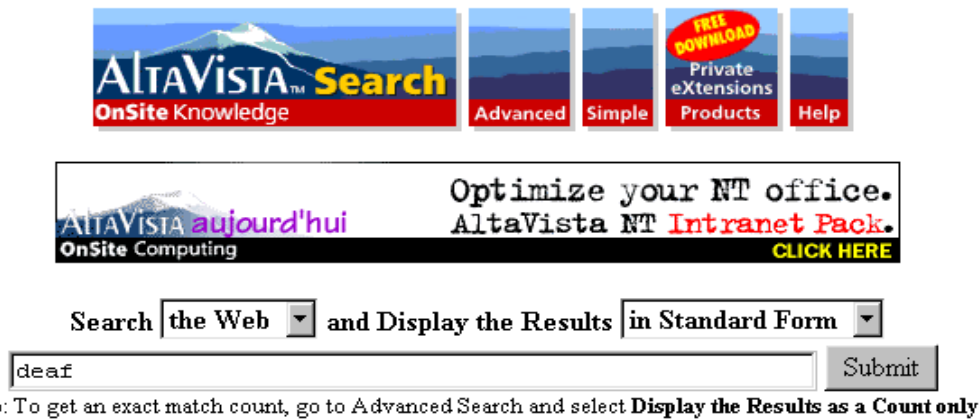
Further, deaf people appear to have a particular affinity for the WWW. Although sound is now beginning to emerge as a feature on the web, the web began as a wholly graphic interface. That feature allowed people who are deaf access to everything the web had to offer and on a level equal to that held by people who can hear. Alone, that characteristic would make the web attractive to deaf people; however, the web is not only a source of stored information, it is also an effective medium of visual communication. The combination of those two aspects may have led to a particularly rich body of deaf-related information available on the web. Although such is unproven conjecture, an examination of deafness information available on the web, deaf people, and deaf culture does show the WWW as an important resource for deaf people and involved professionals.

There is a variety of search tools available for locating information on the web and those most used may be found by selecting the “Net Search” area of Netscape Navigator, a graphical web interface. Using different search tools yields different results, e.g., using the following search tools on the term, “deaf” yielded a wide range of results:

AltaVista	90,000+
Excite	57,653
HotBot	93,983
Infoseek	42,892
OpenText	4,933
Pathfinder	147
WebCrawler	2,744

Although there are doubtless many duplicates among the search results, there are well over 100,000 documents on the WWW containing the word “deaf.”

In order to get an idea of what kind of information might be contained in those documents, it is useful to look at the results of the AltaVista search, Figure 1, since that particular tool provides an option to view dynamically generated content lists based on the words which occur most frequently in the documents matching the initial search word or words. The main words are listed in order of relevance and the subcategories are again selected and listed by frequency of occurrence. Following, then, Figure 2 is the AltaVista “map” of the 90,000 documents that search tool identified on the web containing the word, “deaf.”



The image shows a screenshot of the AltaVista search engine interface. At the top, there is a navigation bar with the AltaVista logo and several menu items: "OnSite Knowledge", "Advanced", "Simple", "Private eXtensions Products", and "Help". Below this is a banner for "AltaVista aujourd'hui OnSite Computing" with the text "Optimize your NT office. AltaVista NT Intranet Pack." and a "CLICK HERE" button. The main search area features a search box containing the word "deaf" and a "Submit" button. Above the search box, there are two dropdown menus: "Search the Web" and "Display the Results in Standard Form". Below the search box, there is a tip: "Tip: To get an exact match count, go to Advanced Search and select Display the Results as a Count only".

Word count: deaf: 129775

Documents 1-10 of about 90000 matching the query, best matches first.

**Overwhelmed by 90000 documents? Let [LiveTopics](#) guide you!**

[Way-cool topics map!](#) -- for Java-enabled browsers

[Tables](#) -- for JavaScript-enabled browsers

[Text-only](#) -- any browser, really any browser

[Help](#) -- [User Survey](#) -- thanks for all the feedback!

### [Deaf World Web](#)

Deaf World Web is the central point of information on deaf on the Internet.

<http://deafworldweb.org/> - size 6K - 22 Feb 97

### [Deaf Education Database](#)

Deaf Education Database. Audiological Services: Scotland. Scottish Health Service. Services in Regions (all) Clinical Audiology. Educational Audiology...

<http://call-centre.cogsci.ed.ac.uk/ssc/DEDbPages/8/DEDb83376> - size 747 bytes - 21 Jan 97

### [Deaf Education Database](#)

Deaf Education Database. Database for HI Pupils (2) The database consists of: (a) Record Forms

Figure 1

The screenshot shows a search interface with a search box containing the text "+deaf" and a "Submit" button. Below the search box are three tabs: "Topic Graph", "Topic Words" (which is selected), and "Help". The main content area displays a numbered list of 20 topic words and their associated terms:

1. **Deaf**, hearing, impaired, deafness, blind, braille, speech, visually
2. **Disabilities**, disability, impairments, disabled, assistive
3. **Tdd**, postsecondary, grants, secretary, federal, firs, burden, cfr, proposed, paperwork, cfda, regulations
4. **Gallaudet**, tty, tfa, gallua, contributed, maryland
5. **Impairment**, blindness, discrimination, employment, applicants, qualified, employer, applicant, employers, employees, discriminate
6. **Handicapped**, retardation, retarded, mental, mentally, skills, emotionally, exceptionality, instruction, cognitive, caputo, disturbed
7. **Interpreters**, asl, language, interpreter, sign, interpreting, linguistics, linguistic
8. **Rehabilitation**, vocational, individuals
9. **Education**, educational, special, teaching
10. **Captioning**, captioned, captions, wgbh, television, caption
11. **Aids**, hiv, hotline, prevention, clearinghouse, national, infection
12. **Accessibility**, accessible, ada, accommodations, americans, accommodation, undue, hardship, achievable
13. **Auditory**, cochlear, ear, implant, implants, sensorineural, cochlea
14. **Students**, teacher, teachers, elementary, school, schools, classroom, districts, district, student, secondary
15. **Counseling**, advocacy, services, referral, placement, counselors, advocates, referrals
16. **Wheelchair**, wheelchairs, mobility, crutches, ramps
17. **Children**, parents, child, adults, families, parent
18. **Disorders**, audiology, audiological, audiologist, audiologists, pathologists
19. **Developmental**, autism, autistic, syndrome, traumatic, disorder
20. **Handicaps**, palsy, cerebral, handicap, epilepsy

Figure 2

The screenshot shows a search interface with a search box containing a list of terms: "+deaf -disabilities -impairment -handicapped -rehabilitation -wheelchair -disorders -handicaps -jesus -dumb -unto -god -usurpations -perfidy -thou -sufferance -rectitude -crowing -blind -ears". A "Submit" button is located to the right of the search box. Below the search box are three tabs: "Topic Graph", "Topic Words" (which is selected), and "Help". The main content area displays a numbered list of 20 topic words and their associated terms:

1. **Deaf**, hearing, impaired, hard
2. **Deafness**, asl, language, sign, interpreters, interpreting, linguistic, linguistics, sociolinguistics, phonology
3. **Tdd**, headphones, microsoft, developer, windows, reference, overview
4. **Gallaudet**, gallua, university
5. **Captioning**, captioned, television, captions, caption, broadcast, pbs, viewers, closed
6. **Tty**, tys, voice, answering, calls, call, teletype
7. **Lesbian**, gay, queer, bisexual, lesbians, gays, transgender, bisexuals, transgendered
8. **Speech**, cochlear, auditory, perception, phonetic, implants, acoustic, implant
9. **Teachers**, students, teacher, classroom, student
10. **School**, elementary, schools, high, grade, district
11. **Education**, educators, learning, instructional, teaching, educational, tesol, secondary
12. **Bilingual**, languages, english, esl, linguists, multicultural, bilingualism
13. **Kids**, backoffice, productivity, vga, products, microprocessor, peripherals, drives, reseller, ordering
14. **Children**, literacy, parents, ages, classrooms, taught, child, families
15. **Speakers**, hardware, related, vary, entertainment
16. **Spoken**, skills, vocabulary, grammar, conversational, reading, comprehension, speaking, situations
17. **Signing**, communicate, signs, conversation
18. **Club**, association, clubs
19. **Modem**, modems, baud
20. **Dreyfuss**, opus, holland

Figure 3

Looking at the full 90,000+ documents, Figure 2 shows the most frequently found words to arrange themselves into the familiar pattern of emphasis on the medical aspects of deafness and the, again, familiar emphasis on disability, disorder, and handicap. However, it was instructive to use another feature of the AltaVista search tool, i.e., its Boolean search capabilities to perform a tailored search. Specifically, the objective was to remove all references to the medical and disability aspects of deafness in order to see if a search of the web would reveal the cultural aspects as well.

The AltaVista search tool allows easy manipulation of search criteria, again, through use of the dynamically generated content lists. By successively searching through several iterations, each time adding medical and disability related terms to the “not” list (Figure 4), the search returned a total of approximately 40,000 documents, just slightly less than half of the original list, whose “content” list appears in Figure 3.

+deaf -disabilities -impairment -handicapped -rehabilitation -wheelchair -disorders -handicaps -jesus -dumb -unto -god -usurpations -perfidy -thou -sufferance -rectitude -crowing -blind -ears -afterimage -department -county -aid -yes -claimants -peterd -she -hours -wonton -bank -injures -belted

Figure 4

In fact, a comparison of Figures 2 and 3 shows the ability to sufficiently tailor an AltaVista search in order to deliver a sizable return of documents that focus on the social, educational, and cultural aspects of deaf life. Whereas the emphasis shown in Figure 2 may well be of primary interest to the medical and support communities working with deaf people, the range of topics found in Figure 3 may be more of interest to deaf people, themselves, as they go about the business of their daily lives.

The Iconovex company offers yet a different way to search the web through its search software, EchoSearch. This software successively searches the web automatically using each of the major search tools and then downloads a user-specified number of the found documents to the local computer for analysis and creates a variety of comprehensive and concept indexes of the selected documents. Excluding AltaVista, an EchoSearch look at the web for the term, “deaf,” retrieved 202,352 documents and downloaded the top 1,000. The qualified index of downloaded documents listed all relevant terms, in context, and in alphabetical order. Unfortunately, at over 600 pages long, an exhaustive treatment of the full index is beyond the scope of this paper except to further note the range and depth of deaf-related information on the WWW and except to make note of the existence and utility of the EchoSearch web-based information tool. By having such an index in alphabetical order, one is able to browse the indexed terms and thereby either obtain a comprehensive overview of terms or find specific terms of interest and then jump in the usual hypertext way to the original document by pointing and clicking on the desired index term. Figure 5 gives an annotated selection of the over 5,000 index entries gleaned from the EchoSearch’s 1000 downloaded documents in order to provide a small sample of the variety of deaf-related information on the web.

**Acquisition of sign language**

Paper on American Sign Language, focusing on the effects of early acquisition of sign language on the cognitive development of Deaf children.

**Calgary**

Web site listing all of the services for deaf persons in Calgary, including the following sample entry: 403-282-9494 Calgary Deaf Society and Deaf Services 63 Cornell Road NW, Calgary, Alberta TEL

**CD-Rom**

"Home page" of Mark Hester living in Pontypridd, UK South Wales who is producing a multimedia CD-Rom of information of interest to deaf people in the UK as final year school project.

**Deaf Education**

Reference to a videotape, "THE INTERNATIONAL CONFERENCE ON DEAF HISTORY: EAST EUROPE AND DEAFNESS (VHS format) [GALLAUDET-1992]. Gives more information on Russian deaf education. Presented in American Sign Language with a spoken narration.

**Deaf Kids**

Leads to an abstract and catalog entry for the article, "Some school characteristics for sev-prof elementary aged kids."

**Hard of Hearing**

A listing of deaf-related web sites organized by broad categories such as "Art and Cultural Links, International Organizations, Schools for the Deaf," etc. Includes a link to the Deaf Puppet Theatre Hitomi of Japan.

**Internet Relay Chat**

Link to Deaf Digital News, an online news server for deaf people and contains an entry on how deaf community writers and publishers meet, chat, and exchange discussions on #deafwriter channel on IRC.

**Italian Deaf**

An entry on contributions to deaf history made by deaf people in Italy. A detailed history of the World Games for the Deaf in preparation for the XVIIIth World Games for the Deaf held in Copenhagen, August, 1997.

**Medical**

Link to an entry for a new book, *Deaf Persons in the Arts and Sciences: A Biographical Dictionary*. This book includes 150 biographies of deaf men and women scientists, engineers, inventors, medical doctors, dentists, writers, sculptors, painters, actors, and other professionals.

**Nigerian Deaf**

Link to an article on the social/political/national linguistic considerations of teaching AMERICAN Sign Language to Nigerian Deaf children.

**Older Deaf**

Link to Deaf Access Wales, Working for Equal Access for Deaf People to Opportunities, Information and Education in North and East Wales, including a focus on the extreme social isolation felt by older deaf people in rural areas.

**Zagorsk**


Full text of the paper, Vygotsky's Contributions to Mentally Healthy Deaf Adults by Steven Thomas Hardy, including Vygotsky's influence on the education of students who were both deaf and blind at the school in Zagorsk, Russia.

Figure 5



So far, this paper has only looked at the content of deaf-related information on the web as found through the use of any of the web search tools such as AltaVista, Excite, WebCrawler, etc. However, it would not be complete without mentioning the numerous web sites focusing on deaf-related information and attempting to collect and present such information in an organized fashion. Of the numerous sub-subject specific sites, 2 of them stand out as good examples of the 2 main approaches to organizing deaf sites and information. Figure 6 is a very good example of the “traditional” collection of lists

## **The Deaf Resource Library**



### **What is the Deaf Resource Library?**

The Deaf Resource Library is an online collection of reference material and links intended to educate and inform people about Deaf cultures in Japan and the United States; as well as deaf and hard of hearing related topics. While I have a bias towards cultural Deaf models, I am also trying to include more material about hard of hearing issues as well.

### **Deaf related network resources**

#### **Quickie Index**

- [Deaf Culture / Cultural Deaf WWW Pages](#) **UPDATED**
- [Schools and Universities for the Deaf \(U.S.\)](#)
- [Schools and Universities for the Deaf \(Japan\)](#)
- [Schools and Universities for the Deaf \(Other\)](#)
- [Organizations off for the Deaf](#) **UPDATED**
- [Other Deaf WWW Resources](#)
- [Linguistics / Sociolinguistics of ASL](#)
- [Resources for Deaf Gays, Lesbians, and Bisexuals](#)
- [Interpreting / Captioning](#)
- [Americans with Disabilities Act \(ADA\)](#)
- [Technological Innovations / Educational Software for the Deaf](#)
- [News articles re: the Deaf community](#)
- [Resources for the Hard of Hearing and Late Deafened](#)
- [Deaf Info on Commercial Information Services \(CompuServe, etc.\)](#)
- [Gopher sites and FTP resources for the Deaf](#)
- [Deaf Mailing Lists, Newsgroups, and Online Magazines](#)
- [Home pages of members of the Deaf community](#)

Figure 6

of links to related sites which sprang up on the WWW as users began to try to catalog or classify web sites that were related to each other. Shown in that figure is the introductory paragraph listing the scope of the site, <<www.yale.edu/~nakamura/deaf>>, as presented by Karen Nakamura, the site's creator and caretaker. Although the various lists on this site are extensive, presented here is the "Quickie Index" only which functions as a table

**DEAF WORLD WEB**  
A central Deaf point on the Internet

**Information Center**  
[DWW News](#)  
[Search- Recherche-Suche](#)  
[Email to DWW](#)  
[User Guide](#)

**Social-Cultural Resources**  
[English and Others](#)  
[Deaf CyberKids](#)  
[Discussions & Chats](#)  
Online ASL Dictionary

**Reference & Directory**  
[Deaf Email Directory](#)  
[Nations](#)

International  
Europe - Europa  
Internet  
Argentina  
Go to...

Welcome to **Brave New Deaf World!**

Deaf World Web is the largest and leading multi-purpose deaf Website, providing deaf-related information on all subjects from Socio-Cultural Resources to References around the world.

"Undank ist der Welt Lohn."

[Awards and Press](#)

**182788**  
Founded 1.February.1995

**Copyright** © 1995-1997 Jolanta Lapiak  
Netscape 3.0 & Explorer 3.0 enhanced.

Figure 7

of contents to the remaining linked lists. It is worth noting that the traditional site lists, as offered by individuals, may or may not attempt to be comprehensive depending on the wishes of the lists' creators. Ms. Nakamura's list, as mentioned, is quite extensive and represents one of the better deaf-related lists on the web.

Figure 7 is representative of a later approach to organize subject-specific information, i.e., a combination of both abbreviated lists and a dedicated search tool limited to the subject of the web site. Here, the site is the Deaf World Web, <<[www.deafworldweb.org](http://www.deafworldweb.org)>>, and functions as an online international encyclopedia of deaf-related information and other deaf web sites and can be accessed currently in English, Danish, French, German, Italian, Netherlands, Spanish, Swedish. The user has the option of simply following the web links as usual or selecting an organization of sites and information by any one of a listing of 63 countries which is filling with deaf-related links as the organization grows.

### **3.0) Closing**

In reviewing the information found on the WWW related to deafness and deaf culture, it has been shown that there is an extensive electronic resource on this subject for librarians, for deaf people, and for persons desiring information ranging from the purely medical, across the range of social, national, and reference, to the personal information offered by individual deaf people. This constitutes a broad source of information able to be tapped by anyone with an Internet connection and standard search software. Most indications regarding the future direction of the web show it to continue to grow at a phenomenal rate and to continue to stabilize, thereby enabling it to be used more and more as a standard medium of communication, publishing, and reference.

Although it is clear that the web has a great value as a current resource, what is not clear is how to answer the traditional questions of information quality, e.g., a collection of "selected" information, and information preservation. Librarians will have to address these issues and help define new protocols and procedures and new means for teaching the public how to search for information and how to weigh the quality of what is retrieved. The emergence of publishing on the web also draws into question the notion of complete or comprehensive collections, such as Gallaudet University's Deaf Collection. In conjunction with librarians everywhere and especially those who work with any kind of special collections, Gallaudet's librarians will have to face these questions and devise the new paradigms for collection building and preservation; while, at the same time, the Gallaudet University Library, itself, continues to add to this wealth of deaf-related information by digitizing selections from its collections and making them available on the World Wide Web.