# BASIC INTERNET TOOLS FOR FOREIGN LANGUAGE EDUCATORS

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## Introduction

The Internet is a vast place, and the amount of information potentially available is hard to imagine. More difficult still is conceptualizing how it all works and how one can access this wealth of resources. Fortunately, tools exist to assist in Internet navigation, and what could be a truly daunting undertaking has been facilitated by a number of applications and protocols. This chapter aims to define briefly some of the various tools Internet users can employ to make their way around the Internet, extract useful information, and in general turn it into a useful and user-friendly commodity for them. The projects described in this book make use of all sorts of Internet applications and mechanisms, and it behooves the foreign language (FL) teacher reading this volume to understand the protocols that make such projects possible. Having a better understanding of how the Internet works and how various programs can be used for specific FL teaching purposes will enable FL educators to venture confidently into the net and make it an extension of their classroom. It will enhance their ability to conceive Internet-based projects and to solve the inevitable problems that appear. To that end, this chapter will discuss electronic mail (e-mail), Gopher, FTP, Telnet, Usenet groups, LISTSERV lists, and the World Wide Web (WWW), with particular attention to relevance for FL teachers. Suggestions will also be made for where and how to find materials that are germane to the goal of enhanced FL education.

## E-mail

The most common method of using the Internet is e-mail. If you are reading this book, you probably have e-mail access of one form or another. If you do not, it is highly likely that you will run out and get it after you finish reading about all of the wonderful projects you can do via e-mail and other electronic communications connections to the Internet. E-mail is precisely what its name implies: an "electronic post." To use e-mail, you must have an access (preferably local to minimize phone charges) to the Internet, which can be provided by numerous means. Many FL educators have e-mail access through their home institution. Such accounts are often assumed to be "free," but make no mistake: somewhere, someone is paying for the Internet connection. Other possibilities for access include freenet or communitynet systems, which function much like public broadcasting stations dependent on listener donations for survival, and a plethora of commercial enterprises offering Internet access among their

commodities (e.g., CompuServe, AOL, Prodigy). E-mail access also necessitates software to enable your computer to talk to the host computer, ensuring that you can issue commands, receive mail, and generally function in the e-mail program. Many e-mail software programs exist, and each has its own system of commands and operations. You need to check with your local e-mail service provider to obtain instructions that are specific to your particular system.

General e-mail functions include: sending and receiving new mail, saving mail to a file system, replying to a message received, including parts of previously received messages in responses, and forwarding mail. Because the commands for these functions are different in each software program, you need to pay close attention to how your own system functions. For example, in some e-mail programs, hitting the "r" key causes a reply message to be sent to the sender of the message. That may be fine if you think you are replying to a message or posting from an individual. However, if the message came from a discussion list (see below) and was merely "signed" by the individual, your "reply" action could cause your response to go out to a list of hundreds of other subscribers instead of just that one individual. The potential for embarrassment is obvious; hence, it is wise to learn the mechanics of your e-mail system and exercise caution in carrying out commands. If you do make a mistake along these lines, rest assured that you are one in a long, long line of Internet users who have done the same thing. Laugh at it, learn from it, and carry on.

E-mail is becoming so common that it will soon be as essential as the real postal service and the telephone. Indeed, people now routinely ask you for your "e-mail address" in addition to or instead of your postal address and phone number. In fact, it has been suggested that because of the Internet ". . . your telephone is superfluous" (Krohl, 91). Tell that to the adolescents you teach! Typically, an e-mail address includes some semblance of the user name, the symbol @, and a domain name indicating where the user's access origin is (e.g., ponterior@snycorva.cortland.edu). The information to the left of the "@" pertains to the user (here, Robert Ponterio); the information to the right is the address of the host computer system (in this case, SUNY/Cortland) and generally gives an indication of the nature of the access site. For example, .edu signifies an educational site, while .com represents a commercial provider. Countries other than the United States have their own tags at the end of e-mail addresses that are generally recognizable abbreviations (e.g., Canada=CA; Ecuador=EU; France=FR; Germany=DE; Switzerland=CH, and so forth).

Because e-mail is an international phenomenon, people all over the world are using it to communicate. A few problems that are peculiar to FL educators should immediately come to mind as a result. People using e-mail will want to communicate in their own language, and FL teachers will want to tap into this potentially rich source of target language dialogue and authentic materials. One problem, of course, is the transmission of accents for languages with Roman

character sets. The normal 7-bit data path used for English and the ASCII character set does not provide for accents. In fact, when people attempt to put them in, the result can be quite displeasing (e.g., il a r=E9clam=E9 le retour des pi=E8ces d=E9tach=E9es =E0 Caen). An 8-bit data path, which basically doubles the number of characters available, does allow for accents and, while not yet entirely standardized, does provide most of the characters needed for typing French, German, and Spanish.

Unfortunately, most e-mail programs do not easily manage these 8-bit character sets yet, but with more and more users demanding this service, improvement in this area should be forthcoming. In the meantime, one solution is a standard called MIME (Multipurpose Internet Mail Extensions), which employs a 7-bit coded format for 8-bit character sets (known as Quoted-Printable). Similar encoding schemes are available to assist in the transmission of non-Roman character sets such as those needed for Arabic, Greek, Hebrew, Japanese, or Russian. FL teachers with MIME compatible software can send and receive these character sets even if their particular e-mail system does not support an 8-bit data path. In addition, a 16-bit Unicode standard exists that allows the representation of all the world's written languages in its 65,536 symbols. This standard is already being employed by corporations that do international business, and it will become more common if FL teachers (who also "do international business") demand it from their service providers.

**Mailing Lists (LISTSERV)**

Mailing lists are discussion groups on the Internet established for people with common interests. These lists are frequently referred to as LISTSERV lists, although LISTSERV refers to a particular type of server. Othermail servers do exist, such as Listproc and Majordomo. (The commands used in the following section to describe various list functions are LISTSERV commands.) Lists are perhaps the most basic electronic communications resource accessed through e-mail, and many exist that have a FL focus. Undoubtedly, many of these FL lists are mentioned in connection with the projects detailed elsewhere in this volume. Some are discussion lists: FLTEACH (Foreign Language Teaching Forum) was founded expressly for professional communication, articulation, and professional development of FL educators, (see Chapter X). Among the many goals of FLTEACH is an increase in sharing information, ideas, and materials between and among FL educators (cf. LeLoup & Ponterio, 1994, 1995).

Other on-line forums can be categorized as service lists: The LLTI (Language Learning and Technology International) list distributes information about all aspects of the technology used in language teaching. Subscribers post information or questions about language labs, video, computer applications, and any technological questions related to language teaching. LLTI is also a forum where subscribers can discuss the value of products or new trends in the profession. The Intercultural E-Mail Classroom Connections (K-12) list (IECC) provides

a service for those FL teachers seeking partner classrooms for international and cross-cultural electronic mail exchanges. It is not a list for discussion or for people seeking individual penpals.

Finally, language-specific lists are well-represented on the Internet. Literally hundreds of on-line discussion groups address particular foreign language interests, and they are as specific and diverse as their membership permits and supports. List topics range from the very general, where FL teachers of the same language converge and dialogue (e.g., EDUFRANCAIS@UNIV-RENNES1.FR- - an international list where French teachers at all levels and in all countries can exchange cultural and linguistic information about France and other francophone countries; ESPAN-L@TAUNIVM.BITNET, a "lista para profesores de español"), to very singular and esoteric topics (e.g., MEDTEXTL@UIUCVMD, a discussion group dealing with "Medieval Text - Philology, Codicology, & Technology") to highly specialized lists focusing on uncommonly taught (at least in the United States!) languages (e.g., READER@TASHA.POLY.EDU, a discussion in English of Arabic [+ Farsi, Urdu, etc.] script on computer). Be cautioned that, while many of these lists appear to remain relatively stable over time, others may wane or undergo some sort of metamorphosis such as a change in name, address, or primary focus.

Joining and then participating on a list are relatively simple processes, and knowing a few rules will ensure successful and happy list membership. First, lists generally are associated with two addresses: one for posting and one for sending commands to LISTSERV to perform functions. For example, to subscribe to FLTEACH, you would send a command to

LISTSERV@LISTSERV.ACSU.BUFFALO.EDU
with the subscription command
SUBSCRIBE FLTEACH Robert Ponterio
Thereafter, to post to FLTEACH, you send your messages to
FLTEACH@LISTSERV.ACSU.BUFFALO.EDU

The LISTSERV address transmits commands to a computer, and the list address transmits messages to people. If you remember this essential difference, you will not experience any embarrassing moments such as the one referred to above in the section on e-mail or frustrating silence after asking a "computer" what it thinks about a certain textbook or if it has ever chaperoned a student group to the Amazon.

Lists come in "all shapes and sizes, " and some are busier than others. The number of daily messages varies greatly among lists and during different times of the year. A general rule of thumb to follow is to read your messages on a regular basis to avoid overflowing mailboxes, which generate error messages and cause much consternation in list owners/managers. Mailbox capacities vary from system to system, so be sure and check frequently on your own space allocation. Most lists offer options such as INDEX and DIGEST as alternative ways to receive daily postings and to assist in managing

high volume list traffic. With INDEX, just the subject headings of messages are sent, and you can select those messages you wish to read and then send for them separately. With DIGEST, you receive one large message periodically from the list, containing all the postings therein. You can then download this message into your word processor and browse for those individual messages of interest specifically to you. When you are going to be away from your account for an extended period of time, it is wise to change your mail setting for high volume lists to NOMAIL to prevent mailbox clogging. Again, all of these commands should be sent to the LISTSERV address and not to the list.

Participation on lists can be active or "passive" and is usually a personal decision. You are generally free to "lurk" on a list, which means you read and perhaps pass along information that you have gleaned from the list to colleagues, or you may post as frequently as you choose. Some lists are moderated, which generally means that the list managers must approve all messages submitted. Some lists require that members meet certain criteria before permission to subscribe is granted. This regulation is generally an attempt to maintain the focus of the discussion, a move greatly appreciated by most list members. Upon subscribing to a list, members generally receive a welcome message with all sorts of information that appears superfluous at the time but that will be desperately needed later on (such as how to unsubscribe from the list and so forth). Save this message or you could ride forever 'neath the streets of Boston . . . .(Kingston Trio, 1962).

When and if you decide to enter the LISTSERV fray, you need to observe certain rules of etiquette. Some that have to do with mechanics have already been mentioned above, namely being aware of where and to whom your message is headed. In addition, the considerate poster adheres to a few general standards regarding the tenor of messages and message content itself. First, please identify yourself at the end of your message, including your e-mail address. Many systems strip the headers from messages, and often people simply do not know the originator of a post nor their address and therefore cannot respond. Most systems have provisions for appending a signature file, which can contain necessary information for contacting a poster (e.g., name, e-mail and postal addresses, work affiliation, phone number). Some people personalize these with computer "drawings" or favorite quotes from famous people (or themselves). Secondly, remember that messages on the Internet can come across in an extremely impersonal manner. The typical body language, facial expressions, and other adjuncts that enrich our face to face conversations are totally absent in this environment. A phrase meant to be funny can easily be interpreted as sarcasm or an unnecessary jibe that was totally unintentional. Whenever possible, use emoticons or those smiley faces :-) to indicate where humor should be understood, for example, or the winking face ;-) to express irony, and be sensitive to the readers at the other end of your message.

**Telnet**

Not only can you reach other people on the Internet, you can also log into other computers. The tool for accomplishing this virtual feat is called Telnet. It is the Internet's remote login application and allows you to sit at your computer and login to any number of computers across the room, the campus, the country, or around the world. This one word (i.e., the application it represents) can give you access to libraries, newspapers, public programs, and many services that other computers offer to Internet surfers. It can also give you access to your home account when you are out of town if you can log into a local provider where you happen to be. This possibility can be very useful if you are subscribed to many lists and forgot to set yourself to NOMAIL during your absence. It can also allow you to stay in contact with colleagues in case you need last-minute information for presentations or any other reason. To find out if you have access to Telnet through your local service provider, type the word telnet at your command prompt. If you are using an icon-driven system, click on the Telnet icon. If you have a Telnet connection, the program will start up. Some programs offer a direct instant connection if you type telnet and the Telnet address all on the same line. If you do not have Telnet, you will probably get an error message, but you will not have broken your computer or the Internet.

Once you have established the availability of Telnet on your local system, you need only find Telnet addresses and then you can literally "go to town" or Katmandu or wherever you want, providing you have the Telnet address. These addresses look much like the righthand part of e-mail addresses, and they sometimes have a number at the end. This number indicates the port or particular computer or server on the system; the default port is 23 and is generally omitted. For example, the Telnet address for the home of FLTEACH is SNYCORVA.CORTLAND.EDU (default port).

Once you start up the Telnet program and are connected, you will usually see a screen message that indicates the escape character. Make sure you make a note of this character so you can leave the remote system when you are finished with your Telnet session. A typical escape character is "CTRL-]" or carat-left bracket, but these sometimes change. Next, you will need to know the login and password of the server where you are attempting to connect. If you are headed to a public site, you will most likely have this information or it will be provided to you. If it is not and you do not know it, simply quit the Telnet session and go elsewhere or home. The "close" command is also handy when you want to disconnect from a remote system in the middle of a connection. When you are logged into a remote system, the commands pertain to that system and not yours. If you need assistance, type "help" to see what commands will work on that particular server.

**Gopher**

Gopher is a menu-driven application that allows you to browse all kinds of Internet resources. The analogy of a library card catalog has been used frequently to describe this tool (Crispen; Krohl).

Essentially you go exploring "library" sites around the world and, when you find something interesting, you ask the Gopher to "go fer" it and bring it to your computer screen. The exploration and information transfer are possible because all of these menus or "libraries" are interconnected, making up a vast Gopherspace.

In order to venture into Gopherspace, a Gopher client running on the local system is necessary. The fastest way to find out if you have one is to type the word gopher at the command prompt. Again, in an icon-driven system, click on the Gopher icon. If a Gopher client is available and running, the program will start up. If you have a Gopher server at your local site, its home or root menu will most likely show up on the screen. If you do not have Gopher access, you will get an error message but once again, you will not have broken your computer or the Internet.

Now you can begin your exploration of Gophers all over the world. Each menu can potentially lead you further into that "library" or into another with an entirely different collection of resources. The menus operate in a hierarchical system of pathways to help you find your way back home. It is not necessary to leave breadcrumbs along the way--you merely type "u" for "up a menu" until you reach your destination. You can also "quit" the program entirely and exit. Some Gophers are text-based while others have graphical representation (icons) to lead the browser from menu to menu.

One nice feature of Gopher is the ability to make bookmarks once you have arrived at a location you think you would like to return to in the future. This capability provides a wonderful shortcut for the next time you want to go directly to, for example, the weather report in Ushuaia. To make a bookmark in most Gopher applications, you press a designated key and the current item is added to your bookmark list. Single items or an entire menu can be added. You can also delete bookmarks, view your bookmarks, and perform many other commands as well. Check with your local service provider for operation and command instructions because Gopher client programs are all different. Some are freeware and can be downloaded from Internet sites, some cost (either shareware--also "downloadable" or commercial products), but they all have the basic purpose of accessing Gopherspace.

Below is an example of the Gopher root menu for SUNY/Cortland:

Home Gopher server: gopher.cortland.edu

1. Welcome to SUNY Cortland's Gopher Server (1KB,01-Nov-1994)
2. New Items on this Gopher (764 Bytes,01-Nov-1994)
3. SUNY Budget Info (Help save SUNY!)/
4. Administrative Information/ -->
5. Academic Information/
6. SUNY Cortland Info/
7. News, Events, Sports and Calendars/
8. Library Resources/
9. Internet Services/
10. Computing Services/
11. Campus Life/

12. Cortland's WWW Home Page <HTML>
13. HELP!!!! /

Press ? for Help, q to Quit Page: 1/1

Various symbols appear at the end of menu items to indicate what these items denote. In a UNIX Gopher client, the slash mark (/) at the end of a menu item indicates a gateway or path to another menu (e.g., #3). When no more slashes appear, you are at the end of that path. It is possible to establish keyword search engines in Gopher menus as well, as illustrated by the <?> symbol at the end of some menu items (e.g., #4). Selection of this item allows requests to be made to a data base for information. The marker <HTML> denotes a link to a WWW page item displayed using hypertext markup language (e.g., #7). The graphics that are generally associated with this platform are not visible through this Gopher server. Gopher items can also be used to launch a helper application to play a sound, display an image, or just save the file to disk.

**FTP**

FTP (File Transfer Protocol) and Telnet are two of the oldest Internet utilities, allowing two machines to communicate with each other. Whereas Telnet lets you log into an account at a remote location and interact as if you were there, FTP allows you to move files between accounts on different computers, wherever they might be, at home and at the office or even in different cities, as long as both computers have Internet addresses. It is rather like getting access to two disks between which you can copy files, only the disks are not on the same machine nor even necessarily in the same country. The requirements are an FTP server running on a remote machine and an FTP client running on your local machine. There are two major ways to use FTP. You can move files between computers on which you have accounts or you can get files from an anonymous FTP server. We will look at both of these features.

Suppose that you have an account at SUNY Cortland and another at the Sorbonne, where you are doing research for your latest book. There are important text files that you need to access in both accounts as well as charts in the form of image files, digital sound recordings of the Paris Metro for your World Wide Web Paris page, and a flyer in Russian using a Cyrillic font in a WordPerfect document. You can use Telnet to log into your USA account from Paris, but that does not let you copy the files. Instead, you can use FTP from the Sorbonne account to log into the Cortland account:

$ ftp snycorva.cortland.edu
220 snycorva FTP Server (Version 3.2) Ready.
Connected to SNYCORVA.CORTLAND.EDU.
Name (SNYCORVA.CORTLAND.EDU:ponterior): ponterior
331 Username PONTERIOR requires a Password.
Password: Germaine
230 User logged in.
FTP>

When it is typed in, the password will not appear on the computer screen. The FTP client program on the computer in Paris

has contacted the FTP server on the computer in Cortland allowing these two programs to connect the two accounts, the local one in Paris and the remote one in Cortland, in order to move files between them.

It is important to set the mode for ASCII or binary before beginning the file transfer. Binary mode does not bother about any kind of character set translation. In fact, it makes an exact copy of all of the codes in a file, no matter what they are. This is essential for any file in which there are bytes of data that do not represent text characters. Deciding which is best might be confusing in cases where a text has been typed in a word processor. Many word processors use special codes to keep track of information about fonts, margins, special character sets, and a host of other kinds of information about the text. These files are considered binary, and trying to transfer them using FTP in ASCII mode simply will not work. When in doubt about which mode to use, you can always try one and see if it works. In order to move the chart that is in an image file such as GIF or JPG, we first need to set the FTP mode to binary with the command:

FTP> binary

A sound file such as SND, AU, VOC, IFF, WAV or a moving picture file such as Quicktime or MPEG also must be sent as binary files. What about the Cyrillic text created in WordPerfect? Most text that has the format of a word processor document is really a binary file, so it also must use binary mode. There are some exceptions to this but not many. This word processing format can be a sure way to transfer texts that use non-Roman character sets. If you need to move a large word processor generated file but are not sure which format will work, do a test on a small file first, just to make sure that binary mode is what you need.

Many people on the Internet have decided to make files available to anyone who might wish to get them. For example, someone might write a computer program for practicing verb conjugation and decide to give copies to anyone who wants one. To do this, she would set up a special FTP account that anyone can use. Since the account would not belong to anyone in particular, the log-in name will be "anonymous." No password is needed either, but by convention people type in their e-mail address in place of the password to let the host know who they are. Logging into the anonymous FTP site at the University of North Carolina goes something like this:

$ ftp sunsite.unc.edu 220 calypso-2.oit.unc.edu FTP server (Version wu-2.4(39) Tue May 16 01:34:21 EDT 1995) ready.
Connected to SUNSITE.UNC.EDU.
Name (SUNSITE.UNC.EDU:ponterior): anonymous
331 Guest login ok, send your complete e-mail address as password.
Password:
ponterior@snycova.cortland.edu
230- WELCOME to UNC and SUN's anonymous ftp server

Of course, you will not see your e-mail address when you type it in the place of the password because passwords do not

appear on the screen. Anonymous FTP sites generally accept a limited number of users at one time, so getting into a popular site at peak hours can be difficult. If there are too many anonymous users, the FTP server will let you know. Once you have logged into the anonymous FTP site, you can use the DIR, CD, ASCII, BINARY, and GET commands to find and obtain anything there. Be sure to QUIT when you are ready to leave. Some FTP programs, especially on graphical systems like Macintosh and Windows, can be easier to use than command driven systems. You might see a directory listing for each computer on the screen and simply click on the commands that you wish to execute for changing directories, setting the mode, viewing, and moving.

Many files that are found on anonymous FTP sites are stored and transferred in compressed format. MS-DOS or Windows files often use ZIP while Macintosh uses STUFFIT. If you plan to get files via anonymous FTP, find out about the kinds of files that are used on your system and obtain the decompression software that you will need. You might even be able to use a World Wide Web browser instead of an FTP utility for access to anonymous FTP servers.

**World Wide Web**

The World Wide Web (WWW, W3, the Web) is perhaps the most exciting Internet application in use today because of its power, flexibility, ease of use, and widening access among the general public. A Web browser brings hundreds of thousands of sites around the world within your grasp in an instant. The ability to simultaneously present multiple media, text, images, sounds, moving pictures and to interact with the user to perform functions gives a Web page a power beyond other single medium applications. In a discipline that recognizes the importance of context in communication, the mutual support of the various components of this multi-media tool provide a clear advantage in facilitating the comprehension of authentic texts. The flexibility of a Web page is amplified through the use of Hypertext Markup Language (HTML) to control the graphical formatting of page elements to a degree unparalleled in other utilities. For example, though even the inclusion of French accents can still be problematic for some recipients of e-mail, the use of diacritical marks is standard procedure on the Web, where even the non-Roman character sets of Russian and Japanese have been in use for some time. Unlike some other applications that require the use of a command language, the operation of a Web browser is entirely intuitive. If you can point to something, you can retrieve it.

Retrieving a WWW page requires a browser and an Internet connection. If you can use applications like Telnet and Gopher, then the machine on which they are running has an Internet connection. If you are connected to a network via an ethernet connection, a PPP, or a SLIP connection, then the network most likely has an Internet connection, and you can probably run a WWW browser because your machine can send and receive TCP/IP, Internet data. If your own computer's connection to the network is limited to the equivalent of a VT100

terminal, then you probably cannot run a Web browser. Finally, speed is a concern. Below 14400 baud, a graphical WWW connection seems to be crawling because images and sounds create large files that can take some time to arrive. Finally, if your Internet connection does not permit graphical access to the WWW, it might be possible to run a text only browser like LYNX. That will display the text without any pictures or sounds. To find out more about the kind of connection you have, ask your local experts.

Many WWW client programs, also called browsers, are available both commercially and freely. Mosaic is a free browser, and Netscape is free to educators. Many Internet service providers furnish a browser as a part of the service. These browsers perform the same basic functions and essentially behave in similar ways. Like many other Internet tools, the Web is based on a client-server application. A WWW server is a computer program that is connected to the Internet and has the ability to send files from its hard drive to other computers on the network. To communicate with a server, your computer needs a WWW client that can send requests for data to the server. Since both machines have an Internet address, the messages that they send can find their destination. The most important message that a client sends to a server is a request for a file.

WWW pages are sent using Hypertext Transfer Protocol (HTTP). This tells the client that the file being received is formatted in HTML, the Web standard. Other protocols exist for other utilities such as Gopher and FTP. A WWW browser begins by sending a request in the form of a Uniform Reference Locator (URL) . A URL is an address that specifies a type of file, a host machine and the location of the file on the machine.

http://www.cortland.edu/www_root/flteach/flteach.html

The first series of characters ending with a colon tells us that this file is a hypertext file. The name of the machine on which it is located, www.cortland.edu, can be found after the double slash. Following the next single slash we find the name of the directory, www_root/flteach; and finally, though not always, the file name is FLTEACH.HTML. The HTML indicates that this is a document with HTML formatting tags that can be interpreted by the browser. In addition to the text and formatting information in the HTML document, a document may contain other URLs that refer to other types of data, e.g. images and sounds, to complete the WWW page. Because the browser is configured for the computer on which it is running, it is able to display all of the elements of the WWW page in the best possible way for that particular machine. For example, the screen resolution, available colors, and the presence of special hardware for sound or video will determine what sort of display is possible. Thus the final appearance of a WWW page depends both on the formatting that is written into it and on the configuration of the browser.

Improvements in the abilities of a browser can often be obtained through the use of helper applications. Programs that are

better able to display the images, sounds, or motion pictures in a page can take over the job from the browser when needed. The selection of helper applications is up to the individual user, and many different ones are available and are interchangeable.

Hypertext is not linear. It contains pointers that link one location to another. These links can be found within the same document or in other documents, on the same server or on any server connected to the network. The Internet defines a virtual space in which a link can refer to WWW documents on servers anywhere in the world. The links in a document are references to URLs. They are highlighted so the user can recognize them as links, and when a link is selected, the browser sends a request for a new document to the server in the URL contained in the link. When the new page arrives, it replaces the old one. Browsers make it easy not only to follow a link but to retrace your steps back from a link to the original document. With millions of possible links on the network, it is essential to keep track of interesting discoveries. Bookmarks allow a user to save the URLs for interesting sites so that they can be easily found again when needed. This flattens out the Web by producing a personal hotlist of sites that you might wish to find again.

Besides the nicely formatted, multi-media presentation of HTML documents, a Web browser can also display the files associated with other types of URLs. The ability to function as a Gopher and an FTP client, in addition to being a hypertext client, makes a the WWW the most versatile of the Internet tools. By integrating these other functions, this utility can greatly simplify navigation on the Internet.

Interactivity in a Web page is accomplished through something called forms submission. A form is an area on a page displayed by a WWW client in which the user can type information that will be sent back to the WWW server. What the server does with this information is determined by the developer of the page. The information could be stored, processed in some way, forwarded to someone, used to look up additional information or even to control a physical device. Almost anything that a computer is able to do can be done with information submitted in a form. A typed phrase could be converted into synthesized speech and returned to the user as a sound file; data could be collected about the page topic and later used for research purposes; a keyword could be used to look up an encyclopedia entry or photo archive that could then be sent to the user; a keyboard entry from a client could control a robotic camera whose output would then be sent back by the user as a part of the WWW page. A favorite use of the Web by graduate students is to connect a soda machine to the Internet and use a WWW page to find out if the machine has soda without having to walk down the hall. Believe it or not, there are quite a few soda machines on the Internet! The possibilities are limited only by imagination. As this volume suggests, FL teachers can certainly be as imaginative as thirsty graduate students.

**USENET**

USENET newsgroups are a popular way of participating in on-line discussions. The thousands of newsgroups can represent both advantages and disadvantages compared to e-mail discussion lists. Access to USENET is managed by a news reader. This application allows the user to select a number of groups and to routinely read new messages that have been posted to those groups. It does this by keeping track of what the user has already read. The news reader can present messages in a particular group by topic, allowing the reader to easily follow the thread of a particular conversation or to delete the entire thread by marking it as "read." Messages from USENET do not fill the user's computer file space. A single copy of USENET groups can serve all of the users on a computer system and even those on other systems. All the information that needs to be saved in the individual's account is whether individual messages have been read or not. In some ways this is much more economical than distributing and storing multiple copies of e-mail postings.

On the down side, USENET news groups tend to be less focused than serious academic discussion lists. Less effort is involved in participating and it is easier to ignore a discussion, drifting in and out of the group. Anyone can join in a discussion at any time, and just about anyone does. This often leads to less commitment to the group as a community, resulting in a less collegial, less supportive conversational tone. Quite a bit of variety exists in this area in both e-mail discussion lists and USENET newsgroups, so generalizations can be dangerous. Wonderful discussions and terrible arguments can take place in both lists and newsgroups.

Because of the lower cost of overhead, newsgroups can be an easy way for students to get involved in conversations in the target language (TL) with peers in other schools or around the world. Groups targeted specifically towards the support of K-12 foreign language instruction such as:

k12.lang.deutsch-eng
k12.lang.esp-eng
k12.lang.francais
k12.lang.russian

permit students to make contacts that they can then pursue either in the group or in e-mail exchanges on their own. These are moderated to the extent that a teacher watches the postings to encourage use of the TL and to watch out for any other problems that might develop. Other groups serve as a forum for discussion of a target language culture. Here discussion tends to range from encouraging support of foreigners interested in the group's topic to nasty arguments about cultural differences. These groups can be interesting and even quite useful in their own way.

soc.culture.french
soc.culture.italian
soc.culture.latin-america
soc.culture.mexican
soc.culture.spain
talk.politics.soviet

The language is far more authentic than that found in the K-12 groups. Nevertheless, we would hesitate to recommend them to students without careful supervision. Of course this can be true of many areas of the Internet where items can be found that might be inappropriate for an age group. Empowering students by giving them control of their access to information can lead to this potential problem no matter what medium carries the information. A well informed teaching and library staff that can supervise the students is an important element in developing appropriate uses of this technology.

**Searching the WWW**

A number of tools exist to help navigate the WWW. Because Web pages contain much more information than Gopher menus or the file names at FTP sites, these programs can search through the entire text in a page and produce keywords that are more closely reflective of the topics in the page. Thus a keyword search performed by one of these utilities has a better chance of finding the pages that are related to the keywords you provide. Some even calculate a probability of the degree of relationship so they can present the listing in order from most to least likely to be what you are looking for. The complexity of these calculations means that, given differences in the performance of these WWW search tools, various users might have individual preferences for one or another utility. Try them out to see which seems best to you.

Because everything on the WWW is a page, these search tools are, in fact, Web pages themselves with their own URL. They use forms to obtain a list of keywords from the user and then search their database for matches. Like Veronica and Archie, these programs automatically scan the net in search of new information to add to their data base. When they find a new page, they extract keywords and also look through it for more links that they will eventually scan, and so on. The "Centre Universitaire d'Informatique World Wide Web catalog" (CUI WWW catalog) works by searching through a number of other collections of URLs. A few of the better known WWW search engines are:

Lycos
http://lycos.cs.cmu.edu
WebCrawler
http://webcrawler.cs.washington.edu/WebCrawler/WebQuery.html
WWW Worm
http://www.cs.colorado.edu/home/mcbryan/WWWW.html
Centre Universitaire d'Informatique World Wide Web catalog
http://cuiwww.unige.ch/w3catalog

Each of these allows the "surfer" to enter a series of keywords that will be used to match WWW documents. Generally, keywords need to be at least three letters long, and case does not matter. Any browser that you use will have specific directions and a description of what it does available right from its own page. After the query is submitted, the search page will return a result page with the addresses of all of the pages found to contain the keywords. By default, documents that contain all of the keywords are presented. Keywords must be carefully selected to target the search

objective. Common words such as school will be found in so many documents that the search results will be useless. On the other hand, too many specific keywords could limit the search results to zero. Of course, a search that produces no results might also indicate a spelling error in typing the keywords, a possibility not to be too quickly discounted. Often, several searches are needed to get the desired results.

This simple procedure describes the CUI WWW catalog in Switzerland, making it the easiest to use. The others give the user more control by providing a few additional choices but to do so they also require a few extra decisions. The Lycos page or pages offer several options including searches of the entire data base of just the more common sites. If a search generates too many results, limiting the target in this way might help. The WebCrawler allows a limit to be placed on the number of documents presented. It also will let you modify the search to get documents containing any rather than all of the keywords. Be careful: this usually will get more than you bargained for. The WWW Worm (WWWW) provides the most control by restricting the area of the search and the number of resulting URLs. It also permits boolean operations using UNIX egrep expression syntax, not for the faint of heart. But even the WWWW can simply be used in default mode so the user need not worry about these options.

Much is there to be discovered by surfing the Web, but it does take time. You might enter a search for individual words of interest to generate a long list of sites and then explore to your heart's content: e.g., all references to "Russian" or "Russia" or "Soviet." Or if you know just what you are looking for, you might do your best to zero in on one particular Web Page by specifying a restrictive set of keywords. Either way, these tools make the millions of URLs on the Web manageable for even the novice user.

**Conclusion**

Having read this chapter, you are now "armed and dangerous:" "armed" with resources to explore and "dangerous"-ly knowledgeable about the Internet and its many fascinating components. All that remains is to allot some time, sit down at the computer, and venture forth into the virtual world that comprises the Internet. The projects in this volume are meant to serve as an inspiration and as models for future endeavors in your own classroom. The explanation of the various Internet tools in this chapter has hopefully demystified the workings of this virtual reality and provided some confidence in handling the terminology and protocols necessary to accomplish the myriad of FL projects that are now possible with this technology. With a little bit of work and a lot of imagination and creativity, FL teachers can use these tools to make their classrooms come alive with the TL and help their students see first hand the realities and practicalities of TL use and culture in the real though virtual world.

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