

## Language Learning via the Web

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### ABSTRACT

The World Wide Web is experiencing exponential growth through its primary use as a means of accessing information. Nevertheless, educators are starting to consider its potential for delivering learning materials and indeed some of these materials are starting to appear. This presentation explores some of the difficulties of using the current hypertext model for language learning. Experience with several forms of existing, standalone, multimedia materials provides lessons that can guide development of new forms of Web-based instructional technology. These lessons are very important if we are to be successful in developing and delivering interactive instruction via the Web.

### INTRODUCTION

Few, if any, technological innovations have enjoyed such a meteoric rise in the public consciousness as have the Internet and World Wide Web technologies. Currently doubling in size roughly every 50 days, the growth is nothing short of extraordinary. It is very unlikely that there are very many literate people in the United States who have not heard of the fact that, at the current rate, everyone in the world will be connected in what seems to be mere months.

Within many quarters in education this attention is raising expectations that Net-based technology will be useful for delivering educationally sound materials to any student – anywhere. Indeed, materials are already starting to appear on the Web. The main question at this point seems to be “Are we ready to transition all or some of our lesson materials from current delivery systems to the Net?” If the answer is “Yes!” in whole or in part, then we need answers to more specific questions such as, “Which kinds of instructional interactions are most suited to this form of delivery?” And “What are the potential pitfalls to which we need to be alerted?”

### CURRENT STATUS

The success of the Web is inseparable from the relatively standard interface (such as **Netscape Navigator**, **Mosaic**, and **Microsoft's Internet Explorer**) that is widely available today along with the simple data storage and retrieval mechanism that is being used. These combine to create an architecture that is easily scalable to very powerful systems and is distributable via a straightforward communications protocol. All created at the European Center for Particle Physics (CERN) and the National Center for Supercomputer Activities (NCSA) in Illinois, these employ

and are embodied in the Hypertext Transport Protocol (HTTP) and the Hypertext Markup Language (HTML) that are the crucial elements of the Web today.

Nevertheless, the current status of the system is one typified by two fundamental shortcomings: organization and bandwidth. In the first regard, someone recently described the Web as much like a huge, wonderful library. You enter the front door and there are all the books – piled in the middle of the floor. The second difficulty is illustrated quite well by a recent colleague in foreign language education. When asked whether she was doing anything on the Web, she replied, “Oh, you mean the World Wide Wait?” It is easy to understand that the two areas of concern illustrated here relate to organization on the one hand and bandwidth on the other.

Well, organization is coming quickly as evidenced by the increasing number of powerful search engines that are appearing almost daily on the Web. And increased (or even unlimited?) bandwidth is just around the corner, some say, to follow on the heels of the de-regulation made possible by the Telecommunications Act of 1996. You can obtain more information from “[http://www.technologylaw.com/techlaw/telecom\\_bill.html](http://www.technologylaw.com/techlaw/telecom_bill.html)”.

Any assessment of the current status of the Web for the delivery of instruction would be incomplete without consideration of two final difficulties. First, the current business model is unclear for anyone wishing to use the Net as a distribution medium as part of a self-supporting enterprise. Second, the levels of interaction are inadequate for certain forms of instruction when compared with current delivery systems such as interactive videodisc and CD-ROM.

### **Business Model**

Free!?!? Many people seem to be obsessed with the notion that everything should be free on the Net. Indeed, some individuals have assumed the role of self-appointed guardian and have pledged, vigilante-style, to punish anyone who violates humanity’s supposed innate right to freely access anything present on the Net. Unfortunately, one often gets what one pays for, as is witnessed by the numerous “cob-Web” infested corners of the Net that haven’t been touched since their initial creation eons ago in terms of the Web’s incredible time scale. The issues of protecting intellectual property rights and finding appropriate financial incentives surpass technical problems in their complexity. Thus, it is clear that something needs to be done to create a vibrant, self-supporting system that will continue to be worth our attention.

Nevertheless, there are dangers in picking inappropriate solutions. James Boyle, Professor of Law at American University recently wrote in the *New York Times*:

Not having appropriate ground rules for an information society is “bad politics in the thrall of worse economics. We need a politics and a press of the information age. Access to dirty pictures will be little consolation, and speech anything but free, if we let this moment escape our grasp.”

Boyle’s concerns focus on the wholesale awards that governments are making to anyone who claims the rights to some assumed form of intellectual property. Lawmakers and politicians are “granting monopolies over information and information products that make the monopolies of the 19<sup>th</sup> century robber barons look like penny-ante operations.” Furthermore, MasterCard and Visa, along with their high-tech partners such as Microsoft and Netscape, promise to provide the means to enable the copyright holders to collect their due. See “<http://www.visa.com/cgi-bin/vee/vw/news/PRElco020196.html?2+0>” and “<http://www.mastercard.com/>”.

The challenge, therefore, is to create a system that uses the payment mechanisms that are being put into place, all the while remaining something less than overly restrictive in how the system deals with intellectual property. While it is necessary to protect the efforts of content developers, it is also crucial not to stymie creativity in other quarters through the use of overly restrictive copyright rules and regulations.

### **Interaction Limitations**

As we will see below, there are applications of Web technology that are already becoming available. It is important to understand, however, that the types of materials that are suitable for access via the Web are different from those available on interactive videodisc or CD-ROM. This situation stems mainly from bandwidth limitations as mentioned above, which prohibit the real-time transmission of data in sufficient quantity to allow for adequate fidelity in motion video or audio with suitable quality for language learning.

Finally, the traditional HTML model of static page display with hypertext branching is limited in its ability to provide such simple interactions as answer judging as we often see in interactive materials today. This click and branch methodology is fine for accessing reference materials but is limited in its application to tutorials. Even when materials are designed for some semblance of flow in a question/feedback instructional strategy, delays between a learner's click and the subsequent response (the system latency) can be disconcerting, due to the delays often encountered on a typical Web-based system. But, as we shall see, there are ways to address some of these concerns that provide somewhat adequate solutions in the near-term. In the longer term there is no reason to think we will not have the same level of functionality possible with CD-ROM technology today.

## **MODES OF INTERACTION**

There are several styles of user/system interaction possible in standard Web configurations. Let's first examine the genre that continues to have an effect on current approaches.

### **Computer Mediated Communication**

One of the first uses of the Internet and other digital technologies has been computer-mediated communications. These can be divided into two broad categories: Synchronous and Asynchronous. With "asynchronous applications", messages are either E-Mailed or posted on a system where users are notified upon login of the new postings they have not yet accessed. Example systems have traditionally been computer conferencing and computer bulletin boards. In Synchronous Applications users are online at the same time, exchanging messages and other information in real time as they communicate. Examples of this category are Internet Relay Chat (IRC) and Multiple User Domain (MUD) (or Multiple User Dungeon to some, named in honor of the first text-based adventure game). This class of interaction system is used for social role playing and is being supplemented as well by the newer MOO for "MUD, Object-Oriented", MUSH "Multi-user Shared Hallucination", and MIT's MediaMOO. Access Steve Thorne's Web page on these technologies: "<http://www.itp.berkeley.edu/~thorne/MOO.html>". Also see John December's resource list on computer-mediated communication at "<http://www.december.com/net/tools/cmc.html>" for additional information on these topics in their more generic, non-language learning specific settings. There are also Web based MOO systems under development such as "JHM," an interesting site described as "an ongoing project

to investigate text-based virtual realities.” Visit the Web entrance at “<http://jh.ccs.neu.edu:7043/>” to see how a site functions that is not based on static Web pages.

There are interesting benefits to be derived from this type of application as users use the environment to communicate in foreign languages. The interfaces are text-based at present and are not often accessible via the Web, but it is nevertheless becoming clear that significant amounts of communication in the target language is currently possible using this approach. A Web-based approach that makes connection a bit easier will perhaps become available. Learn about **MundoHispano** at “<http://web.syr.edu/~lmturbee/mundo.html>”.

The traditional form of asynchronous conferencing has existed for some years with online services such as **CompuServe** and *Byte Magazine*'s Bix. Unlike these initial E-Mail-oriented systems, Web-based systems allow for truly multimedia, synchronous communication. For example, the **Forefront Group, Inc.** is selling software called **RoundTable** (“<http://www.ffg.com/rt.html>”) which allows users to exchange documents of all sorts as they participate in the conference. To access an ongoing session you need a Plug-In Module for your **NetScape Navigator** browser. The server is selling for \$2,500 during the Beta period and will climb to \$5,000 afterwards. See “<http://www.ffg.com/rtsale.html>”. They have chat sessions entitled among others: French People Talking, Israel, Italian, Japan, German Chat, La Escuela, Deutsch am runden Tisch, Egypt, and Montréal. You can check out the status of all of Forefront's demonstration sessions at “<http://www.ffg.com/cgi-bin/http2conf>”.

As a simple way to use the Web to promote collaborative work in my French Teaching Methods course, I have developed a straight-forward approach that uses Common Gateway Interface (CGI) scripts programmed in the commonly available PERL scripting language that I have running on the server (“<http://www.perl.com/perl/index.html>”). I combined these scripts with Netscape's frame capability to create a screen with which even the most computer-intimidated student can feel comfortable. Students access a common page for current assignments and activities. One link from that page “<http://moliere.byu.edu/methods2.htm>” takes them to a class roster at “<http://moliere.byu.edu/philos/roster.htm>” and from there they can link to each student's Teaching Philosophy. The Philosophy statement appears within the Netscape browser in the top frame of the two that appear on the screen. A form for posting comments is available in the bottom frame on the screen, in which they can also read the comments posted by the other students. The initial CGI script I used to create this interaction came from Matt Wright's Guestbook script available at “<http://worldwidemart.com/scripts/>”.

### **Traditional Browsing**

The first and most well-known method has been “Web browsing.” Web sites along with home pages and other Web pages are springing up everywhere on the Internet at a rate that makes their numbers almost impossible to track. Pages oriented toward language learning are also widely available and impossible to completely explore. The Foreign Language Learning Center at Southern Methodist University (“<http://flc.smu.edu/>”) is a good example of the types of materials that can be “brought together” for access from one site and its extensive set of Web pages. The Agora Language Marketplace (“<http://agoralang.com/>”) has assembled a broad collection of references and links to other sites and resources. Although language-specific for French, the HAPAX experimental site at Sweet Briar College is interesting in its breadth. It can be found at “<http://hapax.be.sbc.edu/>” and contains about 30 major headings from Art and

Architecture to Transportation. Each of these individual headings has numerous individual site references.

Benefits for language learning in this mode are not much unlike those available at a library, although access via browsing can at times be intriguing in its connection to the topic of interest. There is certainly something psychologically imposing about a site on France – located in France. Ease and readiness of access are definite advantages.

Browsing and authoring are the most traditional of all Web-oriented activities. To browse, the user needs a browser such as the classic **Mosaic**, **Netscape Navigator**, or **Microsoft's Internet Assistant**. A complete list of authoring tools is staggering in its scope and keeping track of authoring tools is almost as difficult as for Web pages. Traditional tools have been those such as **SoftQuad's HotMetal** (perhaps from the image of the now passé, lead type of yesteryear's publishing industry and HTML or HyperText Markup Language, the tagging system that allows for page composition and formatting for the Web) See "<http://www.sq.com/>". **Microsoft** is distributing a free, add-on product for **Word 6.0 and 7.0** called **Internet Assistant** that turns their word processor into an interesting Web page development tool. **WordPerfect** has the same capability. **Netscape Navigator** has its **Gold** version for authoring that allows files to be opened not only for browsing but also for editing. When a Web server's security system has been properly configured, **Navigator Gold** can even "publish" the pages that have been edited on the developers local hard drive. Finally, a new tool from **Sausage Software** in Australia ("<http://sausage.com/>") called **HotDog** has been garnering a lot of attention recently in the press.

### **Guided Browsing**

One straight-forward approach for increasing interaction with materials on the Web can be termed "Guided Browsing." Instead of telling students, "Go surf the Web!" the teacher can say "Access '[http://www.uncg.edu/~lixlpurc/GIP/german\\_units/UnitsCover.html](http://www.uncg.edu/~lixlpurc/GIP/german_units/UnitsCover.html)' and complete Units 1 and 2 by next Monday!" As students access the lesson, they can print the answer sheet and then complete the lesson by following the links provided. The materials on this page were developed by Andreas Lixl-Purcell, Professor of German at the University of North Carolina at Greensboro in conjunction with the US Air Force Academy and represent a major step forward in developing useful strategies for Web access.

### **Web-Based Tutorials**

This form of Web access is akin to "automating the past" but not quite. Theoretically, accessing audio directly from within a lesson is a step forward. If the materials are accessed via the Internet, however, then it is tedious to say the least to click on an earphone icon next to the vowel "a" only to wait 40 seconds to hear a the pronunciation that lasts a fraction of a second. To repeat, you go through the same procedure, and this time it only takes about two seconds (depending on the speed of the computer's hard drive) for the system to set itself up to play back the sound. The lesson I am referring to is located at "<http://teleglobe.ca/~leo/french.html>" and is described by the author:

In the first five lessons, I will especially focus on the grammatical aspects of the French language in order to be able to go into conversations rapidly. This part of the course is not easy and somewhat boring, but don't give up ! The other lessons will be more conversation-oriented.

## **Tutorial-Based Browsing**

The next class of interactions, the development of tutorials that interface with the Web, is one I am currently investigating and involves the use of **IconAuthor 7.0** or **IconAuthor SE** from **Aimtech**. ([“http://www.aimtech.com/”](http://www.aimtech.com/)) **Aimtech’s** Universal Media Access (UMA) architecture allows the learner to benefit from a lesson that accesses resources on the Web, the local hard drive, CD-ROM, LAN, etc. The lesson developer thus has complete control over screen design as well as the sequence of materials that the learner needs to access. This of course opens the debate of learner vs system control, but the developer can establish the appropriate locus of control based on the instructional design being implemented.

## **Dump and Run**

Dump and Run is what we might call the “brute force” methodology for addressing system latency or bandwidth problems. The user essentially obtains materials from the remote site so they can be run directly from the local system.

Traditionally this is accomplished using the traditional File Transfer Protocol (FTP) approach or the newer approach where the Web browsing tool captures the necessary materials from the remote system and places them on a local hard drive. With FTP the software supplier uses a tool such as **PKZIP** (obtained directly from PKWare, the producer, or from almost any online service) to place a combined and compressed form (on PCs, a “zipped” file) on the server. The user can then obtain the file using traditional FTP software or even access from within Web browsers. Users place the copy they download from the remote site onto their local hard drive and then decompress it using something like **PKUNZIP** as in our PC example.

The NCSA Mosaic browser can also be set to capture assets to the local hard drive as they are accessed. Other tools such as Web Whacker from the Forefront Group, Inc. allow the user to download or “Whack” Web pages or entire Web sites at will from the remote server to a local hard drive. See [“http://www.ffg.com/whacker.html”](http://www.ffg.com/whacker.html) for more information. Using this software all resources accessed by a browser on each static HTML page are downloaded and re-linked on the local system. Unfortunately, it is not clear that systems that use CGI scripts as part of the interactions created on the server side will work under this approach.

## **Distributed Interactive Multimedia ??? (not DIM for short!)**

Java: See the Netscape 4 December 1996 Press Release  
[“http://home.netscape.com/newsref/pr/newsrelease67.html”](http://home.netscape.com/newsref/pr/newsrelease67.html)

Microsoft and NetManage, makers of Chameleon are jointly developing a product that will make OLE easy over networks. All current OLE control containers, including Visual Basic, Visual FoxPro, Visual C++, and Access as well as third-party products.

Streaming technologies are where it’s at (Jerram, 1996)

Macromedia’s Shockwave

RealAudio

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## **BIODATA**

Michael Bush, involved in programming different computers in various ways and using them to solve diverse problems over the past 27 years, has a very wide range of experience in the uses of high technology in education. At the US Air Force Academy he developed technology solutions for language learning and played an instrumental role in the installation of what was probably the first operational interactive videodisc-based language learning center of its kind and size on any college campus in the world. Since his retirement from the Academy in August, 1992, Professor Bush has been serving as Associate Professor of French and Instructional Science at Brigham Young University.

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