The Web-Based Online Virtual Language Center

Peter Yang
Case Western Reserve University

Abstract

The Web-based virtual language center (VLC) has become a reality for language learning on many campuses. It offers students obvious convenience of time and location. They can attend lab at any time they want (it is open 24 hours a day, 7 days a week) and from any location where they have a networked multimedia computer.

However, the decision about which language center services should migrate to Web-based delivery is a difficult one because the VLC is "self-service" without lab assistants and is based on emulating the existing physical language learning environment. There are many open theoretical and practical issues concerning its validity as a language learning environment and its establishment and maintenance. Furthermore, it has not yet proven to be an ideal learning environment for oral communication activities between students and the instructor and among the students.

This article will attempt to address some of these basic issues. Although it is not intended to give the reader a ready-made model of the VLC, the author hopes to be able to provide those who are interested in setting up a Web-based language center with some practical suggestions. It is also the author's desire that this article stimulate those who are experienced with the VLC to open a broader discussion of related issues, such as aspects that must be considered for setting up such a center and the ways in which existing VLCs could be further improved.

Introduction

This article attempts to give an account of the state of the art of the Web-based online language center or virtual language center (VLC). Because of its novelty, this "virtual reality" is still underdeveloped and understudied. Therefore, the decision about which language center services should migrate to Web-based delivery is often a difficult one. Largely a student-centered learning environment providing "self-service" without lab assistants, based on emulating the

existing physical language learning environment (Loner, 2000 "Language Lab Online"), there are many open theoretical and practical questions about the VLC's validity as a language learning environment and about its establishment and maintenance. Furthermore, it has not yet proven to be an ideal learning environment for many classroom activities, especially oral communication activities between students and the instructor and among the students.

The article is not intended to give the readers a ready-made model of the VLC. Those who are interested in setting up a Web-based language center should rather assess their institutional resources and students' needs and develop their own models themselves. Such an assessment report was created by the Department of Modern Languages and Literatures of Trinity University in 1998 (Trinity University, "Virtual Language Laboratory Project"). It is the author's hope that readers will find in this paper some useful practical suggestions on VLC-related issues, such as media production, including digitization and conversion; media server setup and configurations related to streaming and delivery; Web server setup and configurations related to student login and logout, attendance report and retrieval, course selection, media selection, data security, and copyright protection.

The Definition of the Virtual Language Center

It is also the author's desire that his efforts lead those with experience in the establishment and maintenance of the VLC to a broader discussion of VLC-related issues such as those aspects that must be considered when planning the development and maintenance of a VLC and ways existing VLCs might be further improved.

Today, the terms virtual language center (VLC) or virtual language lab (VLL) are used indiscriminately to mean two closely related, yet different concepts— digital language lab products and Web-based online language centers.

Digital language lab products such as CAN8, Divace, LangLab, and Virtual Language Lab are commercial software-based language lab products as opposed to traditional hardware-based language lab products such as those manufactured by Tandberg or Sony. LangLab—sometimes referred to as "virtual audio monitoring labs" (Sorgen-Goldschmidt, "Virtual Audio Monitoring Labs"), for example, provides an "alternative to cassette-based and other specialized audio monitoring labs using regular computers." The perceived and advertised advantage of these software-

based language labs is cost efficiency; "a Language Lab for a fraction of the cost!" as an ad of the product Virtual Language Lab puts it. Some of these digital labs—such as CAN8 and LangLab—are also Web-based and other vendors, such as Sony and Tandberg, have also started to offer online versions of their products. These Web-based commercial products can be used as an online language lab or as part of the online VLC. However, most digital language labs are primarily used onsite in a language classroom or in a physical language lab space. Tandberg's Divace exists in three versions, a hybrid LAN/hardware system, a LAN-based (Solo) incarnation and a stand-alone (Lite) version, and is mainly used in the onsite language center.

The Web-based language center, on the other hand, is an online language learning environment (Styrcz 2003). Although it is also software-based, it does not depend on a single software product, but rather capitalizes on a set of hardware devices (Web server, media server, etc.), software applications for content and user management (media streaming, user authentication, data protection, attendance and use information tracking, recording, retrieving and reporting, etc.), and specialized software, such as input method editors (IMEs), software for specific purposes (i.e. accent reduction, composition), etc. The online language center, as opposed to the physical hardware-based or software-base language center, delivers language resources and facilitates language learning remotely via the Web.

While cost efficiency remains an undeniable factor, the virtual convenience of time and location plays a more significant role in the consideration of developing and maintaining this online language learning environment (Hiester and Abercrombie; Winslow 2000). The VLC is primarily intended for language learning activities outside of the classroom (Winslow 2000); however, with some modifications, it certainly can also be used in the classroom. It is important to note that some commercially available, web-based systems like CAN8 and Tandberg's Campieza can be used in both a physical language lab and a VLC.

Attractiveness of the VLC

By distinguishing between the commercial digital language lab products and the Web-based, online language center, this article will focus on the latter and limit the use of the term VLC to the Web-based, online language center.

The VLC has obvious advantages and has become a reality

for language learning on many campuses (Lohnes 2000). As a result, it appears an emerging trend that language centers are gradually moving online (Burston 2003) and students are unmistakably comfortable in this virtual space. Moreover, there is evidence that their usage of lab resources has grown in response to the implementation of a VLC (Doyle 2000). The online VLC uses a user-friendly platform, the World Wide Web, to deliver audiovisual and other language learning materials and facilitates audiovisual communication for language learning via the Internet. The language learner can use it to overcome spatial or geographic barriers and to access language materials. The student can also use it to communicate with each other, with the instructor, or even with native speakers of the target language. Anderson Gong from Electrolux explained his learning experience at the Canpac English Language Institute, Guangzhou China noting that using the CAN-8 Language Lab, "students can channel their questions to their teachers on-line or off-line." (Canpac Quotes) Chat and MOO can also be incorporated to facilitate such communication for online language learning. (d'Ea 2002)

Virtual vs. Physical Language Centers

More and more campuses are fascinated by the great potential of the Web as a language learning environment and an increasing number of language centers are moving at least some of their services to the virtual space. According to my recent survey (2003, unpublished, available at http://www.cwru.edu/artsci/modlang/VLC-Survey/), more than 100 VLCs are now delivering audiovisual and other interactive language learning materials on the Web. Language students overwhelmingly prefer the VLC to the physical one. According to the survey, 95% of students at my university and 95% of all responding language centers confirmed this . The main reason for this preference is the convenience of time and location that remote access to language resources provides, as Jones predicted more than eight years ago (Dvorak *et al.* 1995).

Though the virtual nature of the online language center has its legitimate appeal to students, we need to recognize its particular characteristics. The VLC differs from the traditional, physical language lab in that it emulates a hardware-based language lab using software instead of hardware, and, more importantly, emulates a physical language learning space in an online environment. This involves the use of the network/Internet in bridging the

physical distance or the spatial/geographic barrier between the servers and the language students. The VLC is therefore not only different from the traditional audio lab, but also significantly different from the LAN-based digital language lab. Despite the VLC's emulation of a hardware-based lab in an online environment, the physical distance or spatial/geographic barriers between language students and the server-based source of material and interaction continue to exist. For example, in the physical environment, audiovisual equipment and staff can take care of a range of services. In the online language center, audiovisual equipment and staff are not present. The development and maintenance of the VLC and the delivery of the audiovisual services to the student's desktop or laptop over the network remains a demanding task because of the "virtuality" of a software-base facility and its use in a remote, online environment.

To make the VLC truly accountable to the needs of language learning, both its delivery/server side and its receiving/client side must be carefully designed. For example, sophisticated security measures (which are not necessary in a physical language lab), such as the use of server firewalls, virtual private network (VPN) access, Web authentication, and other user- or content-based protections must be in place to ensure that materials in the VLC are protected from unauthorized access. Administrative features, such as attendance and usage information recording, report, and retrieval, must be developed and maintained to ensure that the attendance, activities, and performance of language students are at least as traceable in the VLC as in a physical lab. Furthermore, online user support, such as setup information for client/browser, media player, font configurations, etc., is necessary and must be more user-friendly in the "self-service" environment of the VLC than in a physical lab.

The decision as to which language center services should migrate to Web-based delivery is a difficult one. The VLC is so new that there are many open questions both in practice and theory. In practice, there are inevitable, if occasional, technical problems involving the Web server, media servers, network access and bandwidth. Indeed, because of its network und Internet accessibility, the VLC might face even more problems than the physical LAN-based lab. Because the VLC is largely "self-service" and does not require lab assistants, the lack of immediately available synchronous technical support can also cause additional problems, which make user-friendly online technical assistance even more

indispensable.

Technical problems related to individual machines, such as AV equipment (audio recorders, VCRs, etc.), individual computers, or even the LAN network in a physical lab might not necessarily shut down the entire physical lab because those problems can often be isolated and audiovisual services can be continued on machines that still work. Network or server problems might however prevent the entire VLC from functioning. Publishers are often more concerned about the exposure of their audiovisual materials in an online environment than in the physical lab or classroom because the former can mean significant loss of potential market value whereas the latter can be considered to be in compliance with fair-use policy or lie within the terms of distribution agreements. As a result, some decision makers and instructors might have fundamental administrative and pedagogical concerns about the language center going online and the possibility of copyright violations by posting publishers' materials online. Instructors may fear that the actual or perceived problems of the VLC may make their homework assignments less enforceable. The majority of the surveyed VLCs have, as discussed below, not yet implemented student tracking features nor analyzed the usage logs of their Web server and media server, which might provide attendance information and information about student activities. Without useful data about their students' attendance and learning, some instructors remain skeptical of their students' use of the VLC and the validity of this virtual learning environment, asking "How can I tell if my students have really attended the online lab and have actually completed their audiovisual assignments?"

From the language center's perspective, transferring certain services online will release students from the physical space associated with those services, but this is not the best justification of requests to the university administration for continued or increased budgetary support in developing online learning materials or improving the online learning environment. This is especially true when no statistical evidence of the attendance and use of the virtual space can be provided. Certainly, the same problem of verifying attendance/activities/identity exists in a physical lab. Aside from testing, many labs rarely check the identity of students. However, the face-to-face presence of students in a physical space can often serve as more "seeing-is-believing" evidence

of the use of the language center than "intangible" VLC attendance. Furthermore, the bandwidth constraints of home-based Internet connections that are far more often made via modem than broadband connections impose additional limitations on the Web-based VLC. Under such conditions, multimedia—especially the use of video—is far more restricted in a VLC than a LAN-based lab.

Therefore, it is imperative to do research and take active measures in the implementation of a VLC to resolve these concerns. Only this can help administrators who have accountability and budgetary oversight make the right decisions and ensure that the VLC is functioning effectively. Given that the VLC serves valid pedagogical outcomes, faculty should be equally involved in this decision making process. Jointly, we have to identify what the Web can do better than, or at least as well as, the physical language center and what it can't do as well as the physical one.

The functions such as interactive multimedia presentation of text, audio, and video and interactive exercises work better in the VLC because audiovisual activities and authentic materials from native Web sites (Brandl 2002) can be directly connected with supplemental interactive exercises and the interactive functions can provide students with more learning aids for their homework than the textbook, workbook, and audiovisual tapes individually could. In this sense, the online language center is better than the traditional language center.

However, we should not ignore the limitations of the virtual learning environment. First, it lacks the tangibility of the face-to-face classroom learning environment. As a result, it is not a particularly efficient learning environment for improving students' linguistic proficiency through oral communication. Although the use of online discussions demonstrably improved oral skills in a lab/classroom environment (Beauvois 1998), the duplication of these results in the VLC would be much less likely due to the "intangible" nature of this learning environment. "While it is reasonable to assume that computer-mediated discussion contributes to written fluency (if for no other reason than increased time on task), any claim that this transfers to oral communication is at this stage purely speculative" (Warschauer 1998). Although the VLC is increasingly becoming a preferred

environment for language students' homework, it has not yet proven to be an ideal learning environment for many classroom activities, especially oral communication activities between students and the instructor and among the students.

In a physical language center, students can be easily paired or grouped for oral communication. "Student monitoring" or "student tracking" (Sorgen-Goldschmidt; Noblitt & Bland 1991; Warschauer & Meskill 2000) can therefore be easily implemented in the classroom, whether through a hardware-based language center or a software-based language lab such as LangLab. Such real-time oral interaction between students in pairs or groups is, at least at the present technological level, virtually impossible in the VLC because of the lack of face-to-face contact of the students and the difficulty for a real-time instructor to monitor the interactions, even if equipped with the fastest connections. There are synchronous voice products that might be used, but these do not yet emulate the multiple/paired groups functions of a traditional system.

Planning and Implementation of the VLC

Other physical language center functions such as courseware and media development, technical support, student training, and faculty development can be enhanced, but not replaced by the VLC. Based on these conclusions, one possibility is to use the VLC as a "virtual extension" instead of a complete replacement of the physical language center (Yang 2000). Furthermore, there might be a "division of labor" between the onsite language center and its virtual extension; while the onsite language center can focus on face-to-face interactions in the classroom and as a gathering place for group activities such as training and testing, the VLC should be primarily designed for student-centered, independent learning activities outside of the language classroom. To develop the VLC as a reputable and effective online language learning environment, various special language learning software should be made available online, such as the comparative voice recorder function, an important tool for language learning and the physical language lab (e.g., Dartmouth's DLRecorder). At the same time, proper student tracking and assessment mechanisms must be in place. The assessment must closely monitor individual students' learning activities so that instructors can easily tell if their students have attended the online lab provided assessments are designed that are reflective of the

students' appropriate language level.

Based on the functional focus of the VLC on homework assignments, conscious strategies must be worked out and specific features must be designed in the planning, implementation and enhancement of the VLC to address the administrative and pedagogical concerns discussed above.

The development of the online language learning environment is a gradual process. First of all, it is a brand-new invention based on many decades of experience with distance education and, in many aspects, is still a dream that needs to be implemented step by step. There are many other things that can also be dreamed of, but we still know too little about them and there are too many technical details that need to be worked out to make these dreams come true. It is therefore impossible and impracticable to replace the entire physical language center with the virtual one, especially overnight. Moving services from the traditional language center to the VLC should be implemented on a gradual and experimental basis. Before a service is put online, it should be thoroughly tested to ensure it will work well.

Depending upon the services provided, coordination with various other departments, such as the Registrar's office and the campus information technolgy unit, is needed. To limit access to students enrolled in language courses, for example, the cooperation of the registrar is necessary to provide a list of login IDs of those students. For a big university, user verification needs to be done on the basis of an automatic institutional mechanism. If media are stored on the university media server, the language center must work with the IT department to ensure that the access to the media server is convenient, the Web server is well connected with the media server so that the delivery of media off the Website is smooth, that student attendance is well recorded, and problems of delivery are solved in a timely manner. The good news is that we now can use Quia Books or Blackboard to solve this problem.

The development of the VLC as a result of emulating the physical language lab is a more complex undertaking than that of the traditional language lab based on analog AV materials. The development and testing alone of new features for interactive and audiovisual exercises involves the digitization and conversion of audiovisual materials,

copyright protection, attendance registration, report, retrieval, etc. Technical support is needed for both the development and the use of the VLC's features. In development, all kinds of technical aspects must be addressed, such as Web server, media server, HTML, JavaScript, ASP, CGI templates for interfaces, interactive exercises, as well as delivery platforms for audiovisual materials. On the user-support side, technical expertise is necessary to train and help instructors and students to use those features. Students should not only have quick-start and troubleshooting instructions readily available on the VLC Web page, they should also be able to quickly reach a real tech support person by telephone or email whenever there is a technical problem.

The idea of creating a VLC first came up in 1995 when Web-based language learning resources were put together to supplement the language lab. When streaming media technology such as RealAudio became available, links to streaming Web casts of international radio and TV stations were put together as supplementary language learning materials. Later, audio tapes that came with the publishers' textbooks used at the university started being digitized and posted online. Efforts were made to deliver audio and video materials with an acceptable quality and to focus on meeting the needs for compliance with copyright laws, and for recording and retrieving student attendance information. The major difference of this VLC planning and implementation process from that of a physical lab is therefore that this process has been incremental and has gone on for years because it was considered as a supplement of the physical lab, rather than its replacement and the planning and development of this supplement has gone hand in hand with the development of the WWW and the related streaming media technology.

The relative maturity of the WWW and the related streaming media technology makes it feasible to more consciously plan and implement a VLC as a partial replacement of the physical lab's audiovisual services. The development of the VLC also has its "byproduct" or "added value": the online interactive and AV learning environment can not only be used remotely, but also in the LAN-based physical lab with Internet connections.

If a project has to start from scratch and one has no

programming knowledge, one might consider seeking funding to hire a part-time media specialist to create the VLC and to process, digitize, convert, and deliver media. A plan to implement the project should be worked out. In the first step, one might focus on media preparation and delivery — at the same time one should make sure that access to the media is protected. Then, the focus can be switched to enhancing the delivery system, creating a recording, reporting, and retrieval system for student login and logout information.

Components of the VLC

The situation will be quite different for big schools, smaller schools, or secondary schools. In terms of demand, large schools have more language students and serving a bigger student body requires more powerful and more robust Web and media servers. But in terms of supply, big schools may have more resources available to experiment with and develop interactive courseware, media preparation, and integration. They might have more resources available for technical support. They can create various templates, tools, or applications that can be used to create components of the online language center. It is also much easier for them to get outside financial support to implement this kind of endeavor. Smaller colleges and secondary schools lack technical and research support. But faculty at such institutions can also use learning management systems or course management systems such as Blackboard and WebCT; web-based activities creating tools such as Hot Potatoes; language-specific lab software such as CAN8 or LangLab to create their VLCs. A VLC should also have a clear picture of its student body. Residential students with LAN connections can be served by high quality audiovisual materials, while commuter or distance learning students with modem connections must have access to streaming audiovisual materials.

On the other hand, although commercial VLC products play a significant role for universities with big language programs, colleges with small language programs with no technology infrastructure or "lab" space could set up VLCs without commercial VLC products. VLCs for these colleges could be wholly operated by the textbook publishers. For example, books.quia.com provides third party support for language learning exercises. It offers student tracking and rich content, items that the author lists as important. Also, Thomson Learning is currently selling Blackboard and WebCT "cartridges" that provide pre-made content to these

courseware systems. Both Blackboard and WebCT are being used as "VLCs." Thomson Learning grants distribution rights for audio and video files as long as they are housed within Blackboard, since there are password checks, student tracking, and only students who buy the texts have access to the content. This integrated registration feature seems to be a big issue discussed in the article. The use of Blackboard and WebCT seem to circumnavigate this issue and should be explored. The pricing is also not prohibitive—$7000 for the "light" version, $25,000 for the full version (per year). For colleges that virtually have no setup costs and little technical expertise in monitoring and upkeep, these products could be a suitable solution.

The creation of a VLC consists of two major components, a) media preparation, including digitization and conversion and b) media server setup and configurations related to streaming and delivery.

a) media preparation, including digitization and conversion

A VLC needs digital media, which must be prepared. Text materials must be interactive and hyperlinked and include multimedia to make more sense their use in an online, learner-centered learning environment. The processing of analog audiovisual materials includes two steps, digitization and conversion. That is, the assets are first captured in as close to an uncompressed format, to later be compressed and encoded for multiple audiences and formats. The digitization is a most time-consuming task because it is a real time process. Digitizing a 60-minute audio tape will take at least 60 minutes and digitizing a two-hour video tape will take at least two hours. The actual media processing process is considerably longer, especially for video.

Once digitized, audio and video recordings need to be segmented into smaller files for easier access by language students. Video post-production and conversion to compressed formats is even more time consuming. A portable tape deck ("boombox") with audio recording feature or a more dedicated audio recorder or a VCR or camcorder can be used to play back the analog source material, and a computer with a video capture card or an external video digitizer based on USB or FireWire can be used to digitize the video material. To convert or compress the digitized clips,

various audio or video conversion or compression programs can be used. The power and speed of the hardware and software to process audiovisual materials is crucial. Based upon the connection speed(s) of the intended audience(s), the digital assets must be compressed for delivery as well as encoded in the medium(s) of delivery (QuickTime, Windows Media, Real). Once audiovisual clips are prepared, one should think about how the clips should be stored, selected and delivered. Some centers prefer to distribute audio or video in a particular format, such as .mpg/.mp3, .rm, .mov, or .wsf, the others choose to deliver more than just one format to meet the requirements of different network connections. For detailed information on hardware and software currently used to digitize and compress audio and video media, see http://www.cwru.edu/artsci/modlang/VLC-Notes.

b) media server setup and configurations related to streaming and delivery

More specifically, a setup of the media server und web server can consist of following major components:

- Media Server;
- Special components;
- Authentication System;
- Student Attendance Recording System;
- Audiovisual Menu of the Enrolled Class; and
- Student Attendance Reporting and Retrieval System.

While media preparation represents a tedious job, the Web server and media server setup and configuration is an even more challenging task. The VLC might need to deal with a series of complicated issues, such as ways of delivering learning materials, student access and learning interface, copyright protection of the publishers' materials, attendance tracking system, attendance report and retrieval system. The media server setup and configuration provides for seamless streaming and delivery. It should be a fast and robust computer that ideally has significant processing power, speed, memory and disk space. It should have the ability to continue to work even after a particular drive crashes. For a list of hardware and software currently used

Developing and Maintaining the VLC

as media servers to store and stream media, see http://
www.cwru.edu/artsci/modlang/VLC-Notes/.

Special language learning components are necessary to
meet various language learning needs, such as
pronunciation, listening, viewing, reading, writing, etc.
These components can be developed by institutions
internally. However, specialized commercial products can
also be used.

Web server setup and configuration deal with student login
and logout, attendance report and retrieval, course selection,
media selection, data security, and copyright protection. As
an authentication system, either a university-wide
authentication system or server side login system can be
used. This will ensure that only those students who are
enrolled in language classes have the access to the
audiovisual materials to meet the fair use requirements of
the copyright laws and license agreements. A practical
issue here is how to limit the number of times a student will
be required to login (as authentication can take place at
several levels, e.g., modem connection, institutional server,
file server, etc.) and, at the same time, not to compromise
access control, data security, and attendance/use
information. Authentication could occur at a web page
presenting the content, or at a file server when the "virtual"
drives containing the audiovisual content are mounted.
It would be a good idea to set up a page with a menu of
audiovisual learning materials for the enrolled class. This
page will allow the student to select the appropriate
audiovisual files from the class's learning materials.

Equally important is to have a student attendance recording
system online that automatically records students' login
and logout times. This information can be delivered to the
instructor in real time or stored in the database so that the
instructor can retrieve it at a later time. The student
attendance reporting and retrieval system sends individual
students' records to the instructors by email or provides
them with lists of class attendance and a searchable interface
of attendance records (login and logout times) of individual
students, and provides the LRC director and the department
chair with an automatically generated attendance lists of all
classes, or attendance lists by month, login time, or logout
time, as well a searchable interface for attendance record of
a specific student. Student tracking is now included in

Blackboard content sold by Thomson Learning for languages, (e.g., *Wie geht's*).

A central issue that needs to be discussed here is whether or not the language center should develop, implement, and maintain the VLC itself or with the help of an IT department. Servers have to be configured, monitored and backed up. Who should have the responsibility for the installation and maintenance of the technological infrastructure? To what extent is it desirable for such activities to be supported outside of a language center? What are the pros and cons of doing it yourself as opposed to having a campus IT unit do it?
Let's take a look at the VLC experiences of other language centers. It might save much time and avoid some common mistakes. According to the survey, 50% of the responding language centers develop and maintain media servers themselves. The other 50% have their IT departments do this. Almost 100% of all responding language centers develop online language center materials themselves. 86% of them also maintain Web servers for their VLCs. And of course, there's a hybrid arrangement involving joint ownership, especially for schools just embarking on technology initiatives. At some institutions, distributed technology leads to innovation at the margins, which, when palatable to the broader community, is transferred to central technology.

When planning the VLC, one should consider the advantages and disadvantages of going alone as opposed to relying on IT services and using the centralized university Web server and media server to store and deliver language media. The main advantage to the former is the relative independence and flexibility in development and maintenance. However, to remain independent and flexible, the LRC must have the necessary budgetary resources to hire technical staff to take care of media server development and maintenance, the creation and processing of language media, and VLC services; and to acquire and maintain adequate and robust hardware and software.

The other question is the current status of media digitization. About three years ago, language centers started to digitize audio tapes and some video tapes for online delivery. Textbook publishers have since started

Improving the VLC: Tracking students' VLC activities

providing audio CDs, and these have become the primary source for online delivery. Digitization from audiocassette is no longer necessary. The digital audio on CD still needs to be converted to audio formats needed for online delivery. More often than not, audio lab programs also have to be segmented into smaller files because delivering an unsegmented 30-minute audio clip online might slow down the network traffic and will not provide the student more learning benefits than saving him/her the trip to the physical lab. Cutting the big chunk of audio into smaller clips can not only reduce the audio transfer's burden to the network traffic, but also allows multimedia use of the material; for example, as components of interactive exercises or quizzes.

With the rapid development of DVDs and digital camcorders, digital video sources are also gradually becoming more and more available. Whereas the conversion of commercial videos or movies on video tapes or DVDs is no longer a technological issue, it is however largely limited by strict copyright laws. Video materials produced by faculty on VHS and Hi-8 still need digitization and then conversion to formats used for network delivery. However, using digital camcorders, faculty now can easily produce their own video materials on MiniDV, which can directly converted to formats used for network delivery. Some language centers also use laserdisc, video taken from satellite TV, etc. as video sources for online delivery. These materials also need digitization, post-production and conversion.

The actual use of the VLC is instructive of how powerful servers various VLCs need. According to the survey, 20% of the responding language centers' VLC media servers have fewer than five streams at peak hours of use; 35% of them have close to 30 concurrent streams; 15% of them have close to 100 streams at peak time; around 30% of the respondents are Ònot sureÓ of the data. The survey shows that the existing VLCs are at a very early stage and there is significant room to exploit the potential of this type of center. Only less than 30% of the responding language centers offer interactive exercises, either in combination with or independently from the audiovisual materials, while the rest 70% only offer audiovisual materials. When Web-based interactive exercises are offered, 30% of these exercises are directly created by the LRC director or other LRC staff; 50% are jointly created in a joint effort by the LRC director or other LRC staff and the faculty; and 20% are offered by publishers.

A topic for further research would be to find out which development method is most successfully adopted by the faculty and students. That is, if done by staff only, is burnout higher, or not "good enough" for rigorous adoption? Are the publishers' materials widely adopted and accepted, and do faculty have reservations about these?

Because the VLC is "self-service" and there are no lab assistants around, it is crucial from the instructor's perspective to know if and how students learn (Sorgen-Goldschmidt 2003; Noblitt and Bland 1999; Warschauer and Meskill 2000) in this virtual learning environment. From the language center's perspective, it is important to make sure that the VLC is as a language learning environment well used or at least as effectively used as the physical lab. But how can we find this out? The first step seems to be to keep attendance/usage records.

The survey shows that most VLCs in the US do not yet keep detailed attendance and usage records. Although many language center directors think that they should have these data, only around 20% of VLCs keep some kind of statistics. VLCs that keep loose statistics extract usage information from web logs located in the Web folders. These data are not detailed, but give the administrators a fair representation of what is being used and how often, as well as when the peak times of the semester are. Some of them run log analysis software against the web server logs weekly. This gives them a general idea of high and low traffic times, number of distinct hosts served in certain periods of time, client locations, etc. This information tells them, for example, how many files are accessed per day, which language materials are the most popular; from where on campus students access the site; whether the hits are coming from on-campus or off-campus locations, and whether students use broadband or modem-based network connections. Generally speaking, these VLCs cannot keep track of each individual student. For example, one of the VLCs has the following estimate: the online lab has had over 7000 "hits" and 1135 "sessions" in March, 2003, which means that 1135 individuals accessed the pages for 30 minutes or less. However, home-grown VLCs and commercial VLC emulators can be enhanced to include such features as student tracking data and individual logins.

Conclusion

At some institutions, media servers are run by IT staff who

may have little idea of the importance of students' "online lab attendance." Some language centers keep loose statistics such as logs of mouse clicks, but not of individual users or which parts of the files they are accessing. Overall, it is very difficult to make useful sense out of this type of data. Some language centers, which do not have any statistics at the present time think that they should have this information available and plan to track the VLC results in the near future.

What can be done about this? Two aspects need to be addressed—attendance and usage. Student attendance information is important to instructors and the language department. It can be a useful VLC service to record this information and make it available to them. Commercial virtual language lab products such as CAN8 Virtual Lab have this feature.

Knowing how students are doing in the VLC is often more important to instructors than whether or how long students attend the VLC. Some textbook publishers have started to provide their textbook users with online "self-test" exercises with a nice feature that allows students to submit automatically graded assignments to the instructor by email. The shareware version of Hot Potatoes also has this feature. Some tracking mechanisms in the CAN 8 or similar commercial virtual lab environments are much more sophisticated. They can provide insights beyond time spent on task to student's learning accuracy, something that may be more important, especially if activities are designed with appropriate feedback that can be provided during the "teachable moment." The CAN 8 Virtual Lab's tracking capabilities enable the instructor to virtually check on every move a student has made in the VLC. For example, records <u>can be kept for instructors to indicate dates and times that</u> the student has spent doing specific lessons, mistakes and corrections the student has made in each assignment, and many other learning facts. This tracked information allows the instructor to review the students' performance in audiovisual and interactive assignments. This information tracked from students' exercises and exams can be saved and printed out for the instructor's and the students' use. When someone's work is in question, the instructor can dig a little deeper. If the VLC is equipped with these features, it can do a better job than the traditional language lab.

This article shows that as an emerging reality, the VLC has gradually become an extension of the language center on many campuses. Because of its convenience to students, the VLC has demonstrated a significant attractiveness to language students and language programs. On the other hand, this "virtual reality" is still in its infancy. It has great promise for future development. Here, I want to echo Lohnes' vision of "the future of the Virtual Language Lab as not just digitized materials, but as an integrated system that includes a database of lesson materials, flashcards, community chats by language, and other tools" (2000 *Language Lab Online*). Surely, we still have a long way to go to reach the point where we can be relatively confident of the VLC as an excellent language learning environment. To that end, language centers have to work hard on overcoming shortcomings such as occasional technical problems and lack of technical support, and on further development of VLC features and sophisticated designs that include integrated audiovisual and multimedia learning materials, student attendance information record, report, retrieval, etc. It is not possible to provide ready-made solutions to these issues in this article. However, I hope that it may shed light on some problems and possible solutions, which will stimulate further discussion on this theme. ◆

Works Cited

Beauvois, Margaret Healy, 1998. Conversations in slow motion: computer-mediated communication in the foreign language classroom. Canadian Modern Language Review. 54.2: 198–217.

Brandl, Klaus, 2002. Integrating internet-based reading materials into the foreign language curriculum: from teacher- to student-centered approaches. Language Learning & Technology. 6.3: 87-107. Available from World Wide Web: (*http://llt.msu.edu/vol6num3/brandl/*)

Burston, Jack, 2003. The role of instructional technology in language teaching: state of the art and future directions (IALLT 2003 Henderson Plenary Award). IALLT Conference.

Chen, H-J, 1999 . Creating a virtual language lab: an EFL experience at national Taiwan Ocean University. ReCALL 11:2: 20-30.

California State University. About CSU virtual language labs. Available from World Wide Web: (*http:// www.calstate.edu/csu-vll/info.shtml#About*)

d'Ea, Teresa Almeida, 2002. Online / virtual learning environments. Available from World Wide Web: (*http://www.malhatlantica.pt/teresadeca/webheads/ online-learning-environments.htm*)

Doyle, R., 2000. A digital language resource center. IALL Journal 23:1.

Dvorak *et al*, 1995. Whither the language lab? IALL Journal 28:2.

Hiester, Chris. Abercrombie, Jack. Penn's virtual language lab on the internet. Available from World Wide Web: (*http://philae.sas.upenn.edu/VLLab.html*)

Lohnes, Sarah, 2000. The language lab online. NERALLD Fall Meeting. Available from World Wide Web: (*http:/ /sarahlohnes.com/vll/*)

Noblitt, J.S. & Bland, S.K., 1991. Tracking the learner in computer-aided language learning. In B. Freed (Ed.), Foreign Language Acquisition Research and the Classroom (pp. 120-131). Lexington, MA: D. C. Heath and Company.

Sorgen-Goldschmidt, Francoise, 2003. Virtual audio monitoring labs: using computers for student speaking and listening work. IALLT Conference.

Styrcz, Andrzej, 2003. Virtual language learning takes off in California. IALLT Conference.

Trinity University, 1998. Department of modern languages and literatures virtual language laboratory project. Preliminary Findings and Plans for Assessment. Available from World Wide Web: (*http:// www.trinity.edu/departments/modern_languages/ technology/assessment.html*)

Virtual Language Lab. Virtual language lab for windows. Available from World Wide Web: (*http:// ds.dial.pipex.com/keylink/vll/vll.htm*)

Warschauer, M., 1998. Interaction, negotiation, and computer-mediated learning [Online]. Available from World Wide Web: (*http://www.insa-lyon.fr/Departements/CDRL/interaction.html*)

—, & Meskill, C., 2000. Technology and second language learning. In J. Rosenthal (Ed.), Handbook of Undergraduate Second Language Education (pp. 303-318). Mahwah, New Jersey: Lawrence Erlbaum.

Winslow, Joyce. New virtual language lab sharpens students' skills outside the classroom. Available from World Wide Web: (*http://cc.uoregon.edu/cnews/winter2000/yamada_lab.html*)

Yang, Peter, 2000 . Should our language resource centers be entirely virtual? *IALL Journal.* 32:2: 37-46.

Peter J. Yang (PhD, Utah) is an Associate Professor of German, Chinese and Comparative Literature at Case Western Reserve University, where he teaches and serves in the Department of Modern Languages and Literatures.

His publications include books, translated and edited volumes, chapters in books, articles, and reviews in Germanics, language teaching and technology, economics, and social sciences. His most recent books include Theater ist Theater on theatricality in the chalk-circle plays by Bertolt Brecht and Li XingDao [Peter Lang, 1998] and Play is Play on the Swiss playwright Max Frisch's The Great Wall [University Press of America, 2000]. Currently, he is working on book projects in 20th Century German Theatrical Masterpieces and Inside China's Economic Reform. He serves on the Modern Language Association Committee on Information Technology.