DEVELOPING AND MAINTAINING A MULTIMEDIA LANGUAGE LAB

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ABSTRACT

Recent trends in education have pushed for multimedia to be made a part of every effective language program. As a result, language programs around the world are incorporating computer labs into their curricula. However, as many instructors and administrators are unfamiliar with this newer technology, integrating computer assisted language learning (CALL) into their overall goals and objectives often proves problematic. This leads to under-utilization of the technology which in turn creates a general sense of dissatisfaction.

The first part of this paper presents the results of a year-long study of a multimedia lab at a full-time, intensive language institute. The instruments for this study included: surveys of both students and instructors; interviews with the program coordinator, students, and instructors; evaluations of the lab facilities in terms of hardware and software; and finally, a year-long qualitative assessment of the multimedia lab. The initial data collected from this study demonstrated that although student knowledge of computers was limited, they felt that CALL was an effective learning tool. Instructors also understood the potential of CALL, yet were unsure of how to integrate it into their teaching methods. Finally, administrators as well were enthusiastic about implementing CALL into their programs, yet were concerned with logistical and budgetary issues.

It is the goal of this presentation to provide instructors and administrators with some practical suggestions for effectively managing a multimedia lab. To this end, the latter part of the paper is divided into three sections: (1) methods for assessing student and faculty needs, and how goals and objectives for a multimedia lab can be established to meet these needs, (2) the development of materials for use in the lab that attempt to accommodate instructor needs with available technology, and (3) procedures to overcome the logistical problems that confront all such labs such as student and faculty training, scheduling and staffing issues, hardware/software management, and assessment and acquisition of new software.

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I. INTRODUCTION

The use of computers as a tool for language learning is a recent trend in the field of English as a Second or Foreign Language. Faced with shrinking numbers of foreign students coupled with an increasingly competitive market, language centers across the globe have established computer language labs to attract new students. Yet despite the increasing popularity of these labs, surprisingly little has been published about how to establish and administer them.

The authors of this paper are both working as lab monitors for just such a language lab at an intensive English language program in Hawai'i. When the authors joined this program, the lab had already been in place for a year, yet it still lacked any established curriculum or explicit guidelines for student use. We therefore began a study to determine what our options were and what we could feasibly do to enhance the effectiveness of the lab.

It is the purpose of this paper to analyze the function of our lab within the overall structure of the parent language program, to gauge its strengths and weaknesses, to explore possibilities for future improvement, and to generalize these findings as much as possible to other such labs. This paper begins with a discussion of the current literature on the management of computer-assisted language learning (CALL)-based labs followed by a description of our facilities, the procedures used to determine the most effective role for our lab within the overall program, and suggestions for evaluating software for use in language labs. Finally, recommendations are proposed for applying all of these strategies to labs in other programs.

II. LITERATURE REVIEW

The amount of literature being written on CALL has grown dramatically in the last few years. Due in part to a steady increase in access to personal computers and the emergence of the Internet and World-Wide-Web, many ESL/EFL professionals have begun to see the importance of using this technology in a variety of pedagogical approaches. Unfortunately, however, this increase in the literature in the pedagogical application of CALL has not been matched in the area of developing and maintaining the facilities required for such approaches. Precious little attention has been afforded the management of a CALL lab, and those articles that focus on this topic tend to cover programs designed for large adult literacy programs instead of smaller, ESL-oriented programs. Another problem in any discussion encompassing computers or computer use is the perishability of that discussion. Any article written on CALL, like computer technology itself, has a very short shelf-life, and articles that were cutting edge as little as a year or two ago are now somewhat obsolete. As a result, the discussion of relevant literature is rather limited.

The first article to be examined is Mansoor's report (Mansoor, 1993) on the use of technology in the Arlington Education and Employment Program (REEP). Although REEP's goal is ". . . to provide for the education and employment related needs of limited English speaking adults who live and work in Arlington, VA. . .", the author does very well in introducing many of the issues that face administrators in smaller, more ESL-oriented programs. One of the most salient of these issues is the defining of both the advantages and challenges of utilizing technology in an educational setting. In describing the advantages, Monsoor cites a 1993 report from the U.S. Congress, Office of Technology Assessment (cited in Monsoor, 1993). Table II.1 shows those items most important to an ESL program.

In discussing the challenges of using technology, Monsoor categorizes these challenges into three areas: philosophical, logistical, and fiscal. The first, the philosophical challenge, has mostly to do with what role the technology plays within the goals and objectives of the program and whether the use of a computer lab will

TABLE II.1 — Advantages of Technology Use

1) Using learning time efficiently	• Learners can move at their own pace, have greater control over their own learning, and make better use of their learning time. • Computers can automatize many of the routine tasks faced by the learner, such as spell-checking. • Some learners may learn better and more quickly through interactive programs than with traditional teaching methods.
2) Sustaining motivation	a. Novelty factor can be a "drawing card" b. Technology can be more engaging, can add interest to repetitive tasks. c. Privacy and confidentiality are added to the learning environment, reducing embarrassment adults often experience. d. Intense, non-judgmental drill and practice is available for those who need it. e. Instantaneous feedback and assessment are provided.
3) Individualizing Instruction	a. Computers can serve as "personal tutors" - instruction and scheduling can be individualized without one-on-one staffing. b. Materials and presentation formats can be customized to suit different learning styles, interests, or work place needs. c. Computers with digitized and synthesized speech can help with pronunciation and vocabulary.

(cited in Monsoor, 1993)

adhere to the educational philosophy of the administration and the teachers. The second, the logistical challenge, deals with the day-to-day problems of staffing and maintaining a computer lab as well as decisions of when the lab will be available to students. The final area of concern is the fiscal challenges. The establishment of a CALL lab is extremely expensive not only in terms of the actual technology (computers, printers, software, etc.) but also in terms of staffing the lab and training the teaching staff to use the lab.

Unfortunately, this report is seemingly more interested in pointing out the challenges than in providing answers to the problems. Monsoor's answer to the philosophical and logistical concerns is basically to work it out for yourself. He does quite thoroughly point out REEP's philosophical reasoning for deciding to use technology, but he gives almost no reference as to how REEP manages the logistical challenges. As for the fiscal, Monsoor's best advice is to somehow develop connections within the business community and if that fails, apply for and hopefully get a grant. None of these solutions is very applicable to a small ESL program where budgets are decided by student tuition and teaching staff are taxed enough without adding the burden of implementing a new approach to their teaching.

In a following work dealing with REEP, Huss-Lederman (Huss-Lederman, 1995) takes Monsoor's work (Monsoor, 1993) one step further by attempting to address many of the logistical problems mentioned in Monsoor. This work is actually a "training-module" for the implementation of language computer labs. One of the most interesting sections of this module is the description of Learning Center Models. Adding on to previous work by Wrigley and Gluth (1992, cited in Huss-Lederman, 1995) the authors give three models of language labs as described in Table II.2.

TABLE II.2 — Examples of Learning Center Models

Self-Access (Wrigley & Gluth)	**Classroom Based** (Wrigley & Gluth)	**Hybrid** (Huss-Lederman)
Walk-in Center • Learners are tested and placed into a customized curriculum. Students work on their own with coaching from teachers, lab monitors, or volunteers.	Whole Class Synchronous Instruction • Working as a class, learners and instructor focus on the practice of one skill. There is little communication between learners. Emphasis on transmission of a skill, e.g.. word-processing, not on language practice.	The Workshop • In the same class, learners of varying abilities work together on a general objective, yet separately on individual language skills within the same content.
Language Lab • Learners use lab as supplement to classroom instruction. Teachers assign work to be done in lab. Monitors help learners to fulfill required homework.	Class Related Electronic Classroom • Teachers generate activities and select software to be done in lab that are directly related to objectives of the class.	Language Lab with Reporting to Teacher • Tutorial software used as outside classroom activity with results being reported back to instructor.
Media Library • Lab consists of multi-media stations connected to the Internet. Learners utilize on-line services to access information via the Internet.	Electronic Writing Lab • With specialized conferencing hardware and writing software, individuals can share text documents and provide feedback. Teachers are also able to view work on-line, while students are writing.	

(cited in Huss-Lederman, 1995)

Huss-Lederman also goes into great detail and provides samples of material for many of the curriculum development process with REEP. Some of the sample material for this micro-management of the REEP computer lab include a variety of lesson plans incorporating lab use into regular language classes, sample lesson plans for exclusively in-lab classes and workshops, sample forms for use when purchasing hardware and software, questionnaires to be used when making decisions on appropriate software and its application (for a discussion of the hardware and software in our lab, please see Section III). For administrators thinking about starting a program such as REEP this training module provides some important management advice and covers issues that can be incorporated into any language program using a CALL lab.

It is obvious that REEP is a well-thought out and organized program. However, application of such micro-management policies would seem inappropriate in a smaller program where instructors tend to be more independent and the incorporation of the language lab into the classroom is less emphatic. The key issue that can be taken from both of these studies and applied to other situations is the need to define exactly what role CALL will take in the entire structure of the program. The need for such a role has been shown in terms of time efficiency, sustaining student motivation, and individualizing instruction. In defining the role the lab will play, it will be easier to define which model of lab should be developed: limited-access, classroom-based, or some hybrid of the two.

III. SITE DESCRIPTION

The computer lab at the intensive English program described here is located in a separate facility from the other offices and classrooms. Although this location is less than ideal, there is

no current alternative due to space constraints on the university campus housing the program. Students must walk uphill approximately 15 minutes from their classrooms to the computer lab, and many of the negative comments made on the student questionnaires employed in this study were directed at this inconvenience.

The site itself is adequate in terms of comfort and space. The room is air-conditioned and has counters designed for computer use giving the proper monitor and keyboard height. The seats are comfortable yet not adjustable. There are 14 Macintosh workstations which are networked to a server and a laser printer (see Table III.1 for specifications).

TABLE III.1 — Specifications for Hardware in the Language Lab

Workstations	Specifications
CPU	Macintosh 631CD • 33 MHz • 500 MB hard disk • 8 MB RAM (16 MB w/ RamDoubler) • 2x CD ROM
Operating System	Apple System 7.5.5
Monitor	14 inch Apple Multi-scan Color
Keyboard	Apple Design Extended Keyboard (with mouse)
Accessories	headphones microphones
Server	
CPU	Macintosh Power PC Workgroup Server 6150/66 • 66 MHz • 700 MB hard disk • 16 MB RAM • 4x CD ROM
Operating System	Apple System 7.5.5 • using Appleshare Networking Software
Monitor	14 inch Apple Multi-Scan Color Monitor
Keyboard	Apple Design Extended Keyboard (with mouse)
Printer	Apple Laserwriter Select 360 • 10 ppm • black/white, greyscale

The workstations are no longer adequate for what is demanded of them. When purchased new, the Macintosh 631CD was a medium-priced, mid-level system aimed at the home and educational market. Today however, this system is less than adequate for the demands of a computer lab. The greatest shortcomings of the workstations are the slow processors (33 MHz), the lack of RAM (16 MB with Ram Doubler) and the relatively small hard disk space (500 MB). Even with the minimum amount of software that has been installed on these machines, both the RAM and the hard disk are at full capacity leaving little if any room for adding newer software. The server suffers from the same problems, especially considering the extra demands required for managing the entire network. On the other hand, the Apple Laserwriter printer is quite adequate and is probably the best piece of equipment in the lab. This model is the workhorse of the Apple line and offers speed, reliability and networking capability. All in all, the hardware found at our lab is in need of upgrading. Glaringly absent at the time of the initial analysis was access to the Internet.

Software Description and Evaluation

In trying to evaluate CALL software, several authors have taken different approaches. Huss-Lederman uses an adaptation from Liu and Chan (1993, cited in Huss-Lederman, 1995) that evaluates software in decidedly SLA terms, such as the nature of linguistic input, practice of cognitive skills, learner processes, and after-use influence on the learner. Mansoor adapts a presentation by Wyatt (cited in Mansoor, 1993) into a "framework of consideration" in which software is divided into three approaches: instructional, collaborative, and facilitative. Several ESL software "guides" (see Carlin & Stephenson, 1996; Hollin & Rowbottom, 1995) have provided lists of ESL software that include descriptions and ratings, however, little explanation is given as to what criteria was used in their evaluations. One of the largest compilations of software lists is from the TESOL CALL Interest Section (Healey & Johnson, 1995), but as the title states it is a "list" with brief descriptions taken from publishers catalogs or volunteer reviewers.

The above works are helpful in defining generalities about CALL software but the program administrator who is trying to make purchasing decisions is left with either evaluation frameworks with no reference to specific software or lists of software with no reference to the criteria used in making the evaluation. Fortunately, there is one publication that attempts to do both. Although not as comprehensive as one would hope, the ESL Technology User's Guide (NRLRC, 1994) is one of the few sources that describes, rates, and gives rating criteria for CALL software. In determining the most appropriate method for evaluating the software in the HELP lab, we have drawn heavily on this guide in developing our evaluation matrix (see Table III.2).

The software available at the workstations can be classified into four categories: application software designed for word-processing, graphics, spreadsheets, and databases; pedagogically-oriented software; multimedia encyclopedias and databases; and a miscellaneous group of software that has little use in a language computer lab (see Appendix for description of all software and a list of software publishers). The pedagogically-oriented software was the focus of the majority of our evaluation. The six programs evaluated in Table III.2 are functional and provide a variety of activities appropriate for the kind of students enrolled at HELP. All the programs are geared toward ESL students who may have differing levels of proficiency in both language and computer skills. All for the most part are user-friendly. It is evident from the table that most of the software programs are designed to be stand-alone products, lacking both networking technology or the kind of management formatting that would be ideal in a language lab. Only one program (WordSmart) has a student file keeping system that instructors would find useful in assessing student progress.

The weakness in this selection of software is variety. The "intended" users of these programs are primarily beginner through upper-intermediate. However, except for CPI Learning Center, all would be quite challenging for the truly beginning language student. Both the language covered in the lessons and the language needed to run the program are at levels that would be daunting for lower-level students. More programs are needed for students who are just starting to read and whose listening skills are not up to the "natural speed" that most of these programs present. Another deficiency in terms of variety are the intended skills the programs focus on. Four out of six programs deal with receptive skills such as reading and vocabulary building. Only one is truly integrative in attempting to cover all the skills of reading, writing, listening and speaking, although the extent to which each of these skills is actually practiced is somewhat limited. From this limited evaluation, rather than searching for additional comprehensive

programs that tend to be more quantity than quality, more software is needed that focuses on individual skills.

IV. THE NEEDS ANALYSIS

Questionnaires

A questionnaire was determined to be the most effective method of collecting information from the students as to how they perceived the lab and what they wanted from it. In order to develop such a questionnaire, interviews were conducted with a limited number of students to determine what format such a questionnaire should take and what questions it should include. This resulted in a four-part questionnaire which consisted of: a section on personal information, five questions about hours spent using computers in a week, ten Likert-scale-type questions focusing mostly on student attitudes toward computers, and a survey section designed to discover what software the students were using and what they found to be most helpful.

The questionnaire was also designed to try and reach students across the full-range of the curriculum. To this end, the questionnaire was designed without any requisite open-ended questions and to be as intuitive as possible. Graphics (emoticons) were used to make the Likert-scale questions more readily understandable. The language of the questions was kept as simple as possible without sacrificing meaning, and the entire questionnaire was limited to one page so that it would look as simple and as easy to fill out as possible. Finally, the questionnaire was designed so that it, or a modified version of it, could be passed out at the end of every term as part of a continual program evaluation. The questionnaire was passed out in the lab to every student who visited it during the final two weeks of a ten-week term, ensuring that even students who were in their first term would be able to respond knowledgeably to the survey. Care was taken to protect student anonymity while still providing assistance in filling out a questionnaire written in a second language.

This subject was also discussed in a faculty meeting and interviews were held with some of the faculty to determine teacher views of the role of the language lab and their degree of interest in developing that role.

V. ANALYSIS OF THE RESULTS

Student Questionnaire Results

A good, representative sample of students responded to the survey, and the trends seen in the results were fairly consistent across the student body. A few of the most salient findings from the surveys are detailed below.

Over 40 percent of the students reported that they had never used a computer before entering the HELP Program. This was crucial information as, at the time of the study, students received only a brief introduction to the computer lab before being turned loose with the expectation that they would spend two hours of their life there each week. For students who were not even familiar with the concept of point-and-click, even the user-friendly interface of the Macintosh could prove daunting. Although optional workshops were being offered later in the term which addressed some of these issues, based on this finding, it seemed that a more thorough orientation and earlier and more frequent workshops focusing on how to use specific software were required.

Also, student attitudes toward computers in general were mostly positive. An interesting find in the surveys was that, despite the fact that more than 40 percent of students reported that they had never used a computer before coming to HELP, almost 90 percent said that they are

comfortable with computers now and a full 96 percent said that they believed they would continue to use computers in the future. Perhaps best of all from the perspective of a teacher, a full 80 percent of students reported that they enjoy the time they spend in the computer lab. All of these results looked very promising, but a further analysis revealed some important problems.

Although 75 percent of students reported that they thought using computers helped them to learn English, the remaining one-fourth of the survey group disagreed. Some even voiced strong disagreement with the idea. Similarly, one-fourth of the students reported that they did not find the software in the lab interesting and that they did not think the specific software available in the lab helped them to learn English.

Most likely, the reason for this dissatisfaction can be accounted for by the fact that almost one-third of the students reported that they are still unsure of how to use the software in the lab. Although the lab monitors attempt to assist students when they notice they are struggling, it is impossible for them to teach hundreds of students individually how to use more than 25 applications. It is only natural that students who cannot understand how to use the software would feel dissatisfied, so it is not surprising that most of the students who reported dissatisfaction with the lab also reported that they did not fully understand how to use the software.

A likely additional source of dissatisfaction may be that students have nothing explicit to do during their time in the lab. Fully two-thirds of the students responding reported that they want more work to do in the lab. According to their responses, they think computers are a useful way to learn English, and they enjoy the time they spend in the lab, yet many of these same people said that the software in the lab is not helpful to them. Lastly, they reported that they would like to have explicit assignments during lab time. Informal interviews conducted with a small sample of students after the data from the questionnaires were collected seemed to indicate that students feel somewhat at a loss while at the lab.

The final section of the questionnaire involved a student opinion survey of the software available in the lab. Students checked software which they had used and then checked whether or not they had found that software useful. The software could then be ranked based on its usefulness to the students from their own perspectives. This opinion survey yielded no real surprises: the word processing software faired very well, followed by all of the ESL-specific software and the test-preparation software, such as the GRE, SAT and TOEFL test preparation applications. Additionally, *Midnight Rescue!,* a children's reading game, did well in the student opinion survey. Generally speaking, these types of software were considered useful by students while other applications were not.

Faculty Questionnaire Results

The faculty questionnaires revealed that the faculty were comfortable with the use of computers, however their attitudes toward CALL in general and the program's computer lab in particular showed more reservation. Perhaps as a result of the physical distance of the lab from the classrooms and the relative newness of the lab itself, it was found that many instructors are unfamiliar with the software in the lab and that relatively few teachers use the lab to conduct classes. Still, many of the faculty expressed a willingness to use computers, especially Internet related activities, in their classes. Using this information, a matrix was created which revealed a great need for access to the World Wide Web and electronic mail. It further pointed out additional software and on-line needs. This information enabled us to begin searching for sites on the Internet that address skill areas not currently covered in the lab and suggested weak areas that could be addressed by additional software purchases.

VI. DISCUSSION AND RECOMMENDATIONS

Based on our findings in our specific situation, we initiated several changes. By far the largest and most noticeable change was the connecting of all the computers in the lab to the Internet. Along with this change, came three other major changes. In order to utilize the Internet effectively, it was necessary to upgrade the workstations' memory from 8 MBs to at least 24 MBs to enable them to run many applications (or Java scriptlets) simultaneously. Furthermore, it was necessary to install a Web browser (in this case, Netscape Navigator 3.01) and create some bookmarks to Web sites that would be of interest to students and help them work on individual skills. Sites were found for listening, speaking, structure, reading, TOEFL practice, and several other categories which helped to fill holes found in the software offerings in the lab. Finally, email accounts were established for all students on the mainframe of the host university, and a Telnet shortcut to the mainframe was installed on each workstation so that students can access their email.

The initial orientation that students receive at the beginning of each term was expanded to include a brief introduction to the most popular software applications used in the lab and Web browsing and email as well as computer usage basics and lab rules. Furthermore, supplementary workshops that serve as training modules for software use, and hopefully pique student interest so that they will continue exploring with such software on their own, were offered as early and as frequently as possible each term so that students would not feel helpless and bored in the lab.

Since in our particular case the lab is staffed by outside student assistants and not by faculty from within the program, and since the faculty was not overly interested in incorporating the lab directly into their classes, it was not possible to tightly integrate the lab with the remainder of the program. Instead, the lab is more of an independent, individual study center. To utilize the lab as fully as possible in this regard, a lab manual was created, through a joint effort of student monitors, that could be used to train future monitors. This manual makes clearer what the role of the monitor should be in the lab, and gives suggestions for monitors to help students direct their studies in the lab.

Perhaps most importantly, a graduate assistant and part-time faculty member was appointed to be responsible for the lab. This meant that, for the first time in the history of the lab, a single person could coordinate the activities in the lab and be responsible for upgrading and maintaining it.

Finally, suggestions were made for the purchase of several new pieces of software to provide a more permanent and specific way of filling in some of the gaps found in the lab curriculum. Those suggestions are summarized in Table VI.1 below:

VII. CONCLUSION

While it may seem like an obvious point, we cannot overemphasize the importance of incorporating the lab into the overall curriculum of the program. Until the lab is firmly incorporated, with the support of both the faculty and the administration, the lab will necessarily be an under-utilized resource. In order to facilitate such an integration, it is vital that both the

Table VI.1 --- Software Recommendations

Programs	Level	Publisher
Reading		
Arthur's Teacher Trouble	beg	Broderbund
Long, Hard Day at the Ranch	beg	Discis Knowledge Research
Just Grandma and Me	beg	Broderbund
Comprehension Power	int	Milliken (Learning Services)
How to Read for Everyday Living	int/adv	Educational Activities, Inc.
MacReader	int	Gessler Educational Software
Favorite Fairy Tales	int/adv	Queue, Inc.
Listening		
The Lost Secret	low int	Dyned International
Inform	beg/int	Dyned International
Speaking/Pronunciation		
Pronunciation Plus	beg/int	Dyned International
Writing		
Practical Spelling	beg/int	Queue Inc.
Creative Writer	beg/adv	Microsoft Home
Grammar		
ESL Demons		Merit
Sentence Combining I & II	int	Milliken (Learning Services)
Verb Usage- Multi-Pack	beg/int	Hartley, Division of Jostens Learning
Vocabulary Building		
Word Attack!, Word Attack Plus, Word Attack 3	beg	Davidson
English Vocabulary	beg	
Community Exploration	int	Conter
Integrated		
Firsthand Access (Listening/Speaking)	beg	Dyned International
Multi-media Reference		
Compton's Interactive Encyclopedia	int/adv	Compton's New Media
Longman Dictionary of American English	beg/adv	Exceller Software
Simulation/Game		
Cross Country USA	int/adv	Didatech Software LTD
Amazon Trail	int/adv	MECC

faculty and students receive training and orientation in the uses -- and potential benefits -- of computer-assisted language learning. Purchasing a load of computers and finding a room to dump them in does not guarantee the genesis of a productive computer lab. Most likely, it is merely a recipe for disaster. In this section, we cover some of the major issues which should be kept in mind when setting up a new, or updating an existing, computer lab.

A first major consideration is, as mentioned earlier, determining the role the lab will fill within the overall program. Answering that question will help to answer the next question: do the individual workstations need to be networked or will they function just as well as separate units? If the individual computers do not need to be networked, then mixing and matching different kinds of hardware and operating systems (i.e., PCs and Macs) is less of a problem. However, if it is necessary that the computers be networked so that they can share information -- so that a teacher sitting at a single workstation can demonstrate an activity for an entire class or

so that student scores can all be recorded on a single computer -- then it is important to ensure that compatible hardware and software is obtained.

Next, it is necessary to have people running the lab who are not only "computer savvy" but also able to deal with the extra needs of ESL students. Ideally, these kinds of labs should be staffed and managed by ESL teachers with a strong interest in using computers for language education. Without such support, developing an effective language lab will most likely prove impossible.

Appropriate software, ranging from trouble-shooting utilities for lab managers to English language software for students has to be acquired and installed in such a way that students can easily access it. Training in the use of all such software will need to be provided. Furthermore, this software must be constantly maintained and updated.

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