# CALL Lab Design 101: Proceed at Your Own Risk!

*Dr. Charles M. Browne*

*Professor, Aoyama Gakuin University*

*Constant innovations in CALL technology often seem to render the purchase of the "latest" model almost obsolete by the time it arrives, leaving decision makers with a bewildering and sometimes intimidating array of choices. Most classroom teachers are interested in finding ways to utilize these innovations to help their students, but past experience has shown them that implementation is complicated and time-consuming, and the benefits are sometimes less clear than anticipated.*

*A common mistakes schools make when creating a budget for a new CALL lab is emphasizing the hardware at the expense of the equally important "intangibles" of lab design: staffing, software, and training programs. Often school administrators and decision makers involved with funding CALL fail to adequately assess or meet the needs of their school population or to address the physical learning environment where the technology will be used. Furthermore, teachers who possess a wealth of experience and information in these areas may be left out of the decision-making process. The purpose of this article is to help bridge the gap between teachers and CALL lab decision makers highlighting key issues to consider and giving practical advice to facilitate making decisions.*

Not many CALL lab coordinators began their careers by first going to school to study how to design and run CALL facilities. Rather, most “fell into” the position due to an overlap between their institution’s need for technology-based language instruction and their own experimentation and experiences in this area. Unfortunately, the scope and magnitude of a CALL coordinator and designer’s responsibilities can be daunting. The decisions that are made in terms of hardware and software choices, as well as the planning for the design of the facility itself, can easily involve hundreds of thousands of dollars and directly affect the lives of many people, including students, faculty, school administrators. The information in this article, however, has been gathered from a wide range of sources, including both theoretical and practical, in order to help people involved in the area of CALL to make informed choices when designing, setting up, and maintaining CALL facilities.

## Needs Analysis

All too often, CALL facilities are initiated (and completed) from a largely top-down approach. That is, "many programs are expected by their administrations, for reasons of competition and prestige, to offer a computer based lab, often before teachers and staff know what to do with one" (Szendeffy, 2000). As a result, purchasing and budgetary decisions are often overly concerned with acquiring the latest, state-of-the-art hardware, rather than with identifying the specific needs of the target population, or with providing adequate funding for intangibles such as support, training and upkeep. When planning a new CALL facility, one suggestion made by many CALL administrators is the need to have as much faculty input as possible during all stages of the process. According to McVicker (1997), this kind of involvement not only helps the CALL administrator to make better hardware and software choices, but also leads to teachers having a greater sense of investment in the facility with the result that it is much more likely to be used.

One useful place to begin when planning a CALL lab is to conduct a needs analysis. This doesn't necessarily have to be a large-scale questionnaire or a formal survey – a good starting point can be to simply ask yourself (or the planners) a series of questions regarding how, and by whom the lab will eventually be used. The process of answering such questions can often lead to a much clearer sense of what type of a lab you will need to develop. McVicker (1997), for example, suggests the following four general questions as a starting point:

1) Is there a high rate of ownership of computers among faculty and students, or will users see the center as a place to do basic productivity tasks such as email and word processing
2) Does your institution serve residential students who will want to use the center during evening hours, or commuters for whom the center will function mostly during the day?
3) How convenient will the center's location be for language classes and/or independent study?
4) Does your institution have in-house training programs for technology, and to what extent can your center take advantage of these programs?

A high rate of ownership of laptop computers, for example, might lead to the development of a lab with a section of empty tables and LAN connections so that students can plug in and work from their own computers. If, on the other hand, you foresee many users needing the lab facilities for basic productivity tasks, special areas might be set aside for precisely this type of computer use (specifying the type of tasks which are allowed at a given station can help to ensure that users who need the lab for specific CALL tasks/software are more likely to have easy access).

Surveying user preferences and determining usage patterns as far in advance as a year before construction is a good idea. This can be done easily within an existing facility by tracking visits and usage, as well as through student surveys. If no facility yet exists, much insight can be gained by consulting with other similar facilities that have established usage patterns and by reviewing the growing body of literature on the topic. Any number of issues will arise when undertaking this aspect of a needs analysis, and it is quite likely that student preferences will differ considerably from faculty preferences. For example, whereas faculty may tend to emphasize the need for group areas or multimedia based learning to do class projects, students often prefer individual carrels where they can focus on completing assignments. Typically, students enrolled in language courses visit the CALL facility two to three times per week and stay approximately 50 minutes per visit.

Not surprisingly, however, student usage fluctuates dramatically depending on assignment and test dates. At most universities student usage tends to double during the days directly preceding exam periods. During these times, the vast majority of students want quiet, out of the way stations where they can drill with vocabulary or grammar based programs. To this end, many CALL facilities now place "low end" computer stations around the peripheral areas of the facility and dedicate their use solely to basic text-book accompanied materials for first and second year students. Student surveys conducted into the use of other types of language technology support these usage trends. For example, at Harvard University, students indicated that they prefer working individually with audio

at single carrels by a margin of 87% to 12% and working individually with video by a margin of 57% to 37% (Doyle, 2000, p.19).

Ideas for doing a CALL laboratory needs assessment can also be found online. At http://eduvista.com/claire/needs.html (1997), for example, an online faculty needs assessment is available, and can be freely printed and distributed. Detailed results of a CALL learning center survey conducted at Temple University can be found at http://temple.edu/icsurvey/ (2000). A more comprehensive resource for both needs assessment and lab design is the IALL (now IALLT - International Association for Language Learning Technology) Language Centre Design Kit (2001). (See http://www.iall.net for further information).

You will also need to pay attention to factors outside of the lab which might affect its use. For example, what is the rate of computer ownership among teachers and students in your population? If it is low, then it may be wise to set aside a certain number of stations in the lab for basic activities such as word processing, email, and net-surfing. If, on the other hand, laptop ownership is high, then the lab should contain a number of empty desks with LAN connections to accommodate their use in class.

Will the lab have enough stations to allow access for all students at all times? If not, what arrangements need to be made to accommodate students who are waiting to use the facilities? If floor space is available, it is often helpful to provide empty tables for individual and group study in the area. This feature is extremely popular with students as it greatly increases the range of activities they can do while in the lab.

## CALL Lab Ergonomics

Over the past two decades there has been a growing awareness among business and individuals of the importance of ergonomics in the design of work and study spaces. This has translated into a multi-million dollar industry for ergonomically correct office products. This gives a CALL laboratory planner a great range of options when developing a new facility. With so many choices, where is the best place to start? Again, a needs analysis-type questionnaire may prove useful. Coleman and Healey (1999) have developed a list of questions to ask, which are focused primarily on ergonomic and task-based factors.

Questions about General Ergonomic Factors:

1) What kind of lighting (artificial and natural) is provided, and how well can it be controlled?
2) What kind of flooring/floor covering is needed?
3) What kind of climate-control is needed?

Questions about Task-based Factors:

1) How does the interpersonal focus of human tasks affect the overall room layout?
2) How do specific staff tasks affect the overall room layout?
3) How does the need of individuals to move around because of what they are doing affect the overall room layout?
4) How do the specific hardware needs involving networking issues (including printing and other peripherals) affect the overall room layout?
5) How do the tasks performed by teachers/lab support staff affect the design of the students' workstations?
6) How do the tasks performed by teachers/lab support staff affect the design of the teacher/staff workstations?
7) How do the tasks performed by teachers/lab support staff affect the design of all workstations?

Again, how your faculty, staff and students answer these questions will have a strong influence on the final design of the lab. Consider, for example, the first three questions related to ergonomic factors. Regarding question one, it is very important to have highly controllable light sources, so that specific tasks can be managed, and the room as a whole can be dimmed or lit with the highest number of permutations possible. Incandescent lights – called pot-lights, recessed into the ceiling, serve well over multi-use areas such as group seminar tables, study areas, and video projected viewing areas, both to increase lighting for studying purposes or dim for viewing purposes. Computer monitors, on the other hand, work best where there are no unnatural hot-spots, reflection off screens, flicker or glare off work surfaces. Diffused, indirect lighting - either recessed or baffled, serves well in this case. A presenter at a recent CALL conference gave a convincing demonstration that diffused, baffled spectrum lights focused downward on the walls causes much less computer glare than any other lighting configuration. Teacher-centered areas, such as whiteboards or podiums, will require more focused lighting or spot-lighting.

In response to question two regarding flooring, a slightly elevated floor, although expensive, can protect and hide the vast amounts of wiring associated with a computer facility. Anti-static carpeting is an excellent floor covering because it both helps protect your magnetic media such as floppy disks and minimizes the amount of dust that will get into the equipment. Good carpeting can also absorb sound in a large room, though it is often not enough. For facilities dedicated to multiple uses, you may want to consider the addition of sound absorbing wall materials (often carpeting) as well as electronic sound dampness. In the University of Victoria CALL facility, the walls have ridged wall carpets that absorb sound through the hard edges of the ribbing. Though no electronic dampness were installed, an infrared audio system allows students wearing cordless, light headsets to listen to audio transmissions without disturbing other lab users.

Regarding climate control, keep in mind that computers last considerably longer and break down less often in temperature and humidity controlled environments. Though lacking in natural lighting,

CALL facility labs are often located in the basement level of buildings because there is more natural cooling and greater humidity control. Artificial air cooling systems are quite important as well, especially for busy computer networks and dedicated server rooms. In addition to standard air conditioning systems, air exchange systems that move volumes of air across the room are good for both computer systems and human beings. These systems are supplied by an outside air source, usually from a shaded area directly outside the lab. While in the design phase, consider elevating the air vents and recessing them into the walls, and choose the quietest system possible to help further eliminate ambient noise.

Another ergonomic factor you may want to consider is furniture. There are now many companies that specialize in ergonomic computer furniture. Glass-top desks which hold the computer monitor underneath can free up desk space and allow for better eye contact between students (and teachers) during communicative and group tasks. Moveable computer desks allow for different arrangements within the same lab, so long as provisions are made for the necessary wiring. Matte (non-glare) surfaces and neutral colors serve to reduce glare. The size and height of chairs and desks may need to be considered if the lab is to be used with younger learners or for those with special-access needs. Most computers now can be easily set up for wireless use, allowing teachers to wheel in a cart of laptops into regular classrooms that are not pre-wired for use. If group work is the focus, consider building carrels that accommodate multiple users at individual stations, and partition each from the other with glass or plastic to increase privacy and decrease noise. If the option is available in the design phase, configure the layout of stations in your lab first, then attend to the wiring needs. Always provide more electrical outlets and ethernet ports in your plans than originally deemed necessary. Allowing for adequate time to discuss these and other factors can help you to develop a much clearer picture of what kind of facility you will need.

## Is Cutting Edge CALL Technology Best?

Too often, school administrators and decision makers involved with funding CALL are more concerned with having a lab that is more technologically sophisticated or state-of-the-art than surrounding schools than they are with analyzing and meeting the specific needs of their own school population. One of the most common mistakes schools make when creating a budget for a new CALL lab seems to be an overwhelming emphasis on hardware at the expense of money for the equally important "intangibles" of full-time support staff, software, and training programs. Davies (1996), for example, quotes a Dean of Faculty's remark as typical of the administrator's perception of the use of technology in mass education -- "By next fall we want you to have a complete multimedia courseware up and running for five languages. And could you please tell me how many people I can reduce the language teaching staff by, once these materials are in place."

One important principle then, is to keep a clear focus on teacher and student needs rather than on technology. An error that many people make when they begin to plan for a new CALL facility is to rely too heavily on vendors for advice. This can often be problematic because typically, they will try to impress you with how the latest (and most expensive) technology will solve all your schools problems rather than think about what's best for your particular situation. One difficulty with implementing the latest (and most expensive) technologies that vendors rarely mention is that the majority of teachers and students will not yet be aware of/comfortable with utilizing state-of-the-art hardware.

Try to take the "lowest-tech" approach possible when designing and setting up the lab. The higher up the technology ladder you go, the more problems you will have to deal with, not just in terms of underutilization by teachers and students due to the steep learner curve required, but also due to the greater number of breakdowns, and software and hardware incompatibilities which always seem to occur with new technologies.

The next principle relates to paying appropriate attention to human resource factors. When making the budget for your CALL lab, it is extremely important that you emphasize the importance of setting aside money for training and support. Once the lab is completed. Students and teachers will need to be introduced to and/or trained in how to utilize the various features of the lab. As Davies (1996) points out, although the promise of new technology was one of the chief reasons for the growth in the number of language laboratories in the 1970s and 1980s, a lack of training in both the operation of and methodology behind their use was a major factor in the quick decline in their use from the 1980s to the present day. Teachers are often intimidated by CALL labs and are much more likely to use them if there is ongoing training and support available to them.

## CALL Facility Staffing Issues

As much as the other computing services at your institution would like you to believe otherwise, the CALL lab is not just another "computing" facility. Your facility will run and support specialized hardware, software and learning materials. Faculty will turn to the CALL lab coordinator for advice and assistance, and students will prefer studying in the CALL facility to other computer facilities because knowledgeable staff are available to help them with both technical and instructional assistance. In this computing facility, language, culture and learning are valued and nurtured. A balance lies somewhere between broad, standardized "computing" practices and the focus on individualized learning, in maintaining the autonomy to press forward with specialized services and to determine pedagogic goals and strategies. Growing and juggling relationships to this end should fall under the lab coordinator’s job description.

Unfortunately, there is no real standard for the qualifications or job description of the CALL lab coordinator. The institutional culture, as well as the size and role of the facility often determine the coordinator’s duties. Larger facilities (at larger institutions) with adequate staffing may require the coordinator to devote more time to administrative or managerial duties while other staff attend to

technical issues and work directly with students. Smaller facilities, however, may ask the coordinator to balance administrative, technical and service-related duties as needed, often as the sole focal point in the large circle of relationships between faculty, students, administration and technology. Regardless of the institution's size, the coordinator is likely the one called upon to promote the use of CALL instruction and to educate faculty and staff in CALL pedagogy. In many cases, faculty and students will turn to the coordinator for advice in teaching methodologies and its application in both older and newer technologies (Scinicariello, 1997). If in this role, the coordinator should possess ample teaching experience and the appropriate credentials, not only to understand the demands of teaching and learning but also to garner the respect of faculty and administrators (often former faculty) looking for guidance and assistance in these areas.

A panel of language lab directors lists the following qualities (in general agreement of the order of importance) for those managing a language lab:

1) language teaching experience and expertise
2) organizational management skills
3) knowledge of another language or experience with another culture
4) technical knowledge
5) instructional design expertise
6) commitment to research and development
7) commitment to service (Dvorak et al. 1995: 32).

The same list of qualities could apply to CALL facility coordinators, though not necessarily in this order. Certainly, administrators and faculty committees creating tailored job descriptions will rank these qualities differently based on the role of the facility and context of the candidate search. For example, a coordinator expected to prepare and give frequent workshops, develop educational materials, and work directly with students using language learning tools and materials, would be

served better with a background in language teaching, knowledge of language and culture, and instructional design. In another instance, the coordinator may be in charge of numerous self-access rooms and technical support staff, and would likely perform the associated duties more effectively having strong managerial skills and advanced technical knowledge.

Budgetary considerations in most CALL facilities tend to limit staffing beyond the position of coordinator, and more often than not so called "extra" staffing needs are met by utilizing part-time student workers. In general, students make excellent staff, because they understand the learning issues facing other students, and instructors feel comfortable working with them. Many students already possess high level computer skills; often those applying to work in the CALL facility do so because they already know and like the environment. However, it is important to keep in mind that student workers in general have different priorities than career employees. Stone (1995) points out that students tend to prioritize school and social life above the job, with the result that their job commitment is generally temporary and short term, their schedules erratic. This can be problematic since the burden of training and scheduling the students becomes a time consuming, never-ending task which invariably falls on the already busy lab coordinator. Career employees, on the other hand, tend to view the job as a desired choice (or a chosen profession), resulting in work hours that are much more stable, and a commitment to the lab and to their job that is longer term and more permanent. Having at least a few full-time employees, especially in the technical support area, will also prove invaluable when (not if) your lab runs into problems. If your network crashes, for example, it might be difficult to rely on a student employee to fix the problem. Whereas students tend to work more effectively with the users than technical support staff – and often in the target languages – they cannot and should not be called on to do work that requires a higher level of commitment or skill than they can offer.

There are other staffing issues to consider as well. One often overlooked aspect of CALL staff responsibilities are the "invisible", non-CALL related demands placed on them by faculty and staff

throughout any institution. In the past five years, the nature of support services has changed considerably as technology has made its way into faculty offices. Faculty members now frequently turn to CALL staff for "just-in-time" support for everything from email program shortcuts to advanced programming in Java. At times, CALL staff are asked by faculty to do workshops on a vast range of computing topics such as word processing, email, Web page creation, spreadsheets and more, even though these are not directly related to CALL. Though these topics are normally addressed in workshops sponsored by other groups on academic campuses, faculty are less likely to attend these due to scheduling conflicts and/or comfort issues. At other times, CALL staff are placed in the role of research assistants or even teaching assistants, when asked to find web materials, administer on-line or audio/visual quizzes and tests or train students to do homework on instructor authored web exercises or even to author web exercises themselves.

Different institutions seem to deal with specialized technical support issues in different ways. Some, such as Simon Fraser University and the University of Calgary in Canada, have developed models based on a Faculty or Department sponsored "technology support team" or in some cases a single appointment who has both the requisite background in technology and the subject matter. Often on-call, these teams troubleshoot hardware, train faculty and staff in the use of specialized software programs, and may work with individual faculty to create learning materials. Frequently, they conduct workshops to train faculty to use the technological tools appropriate to their discipline. At some institutions these teams operate directly out of the dean’s office; at others, they are tied to the language learning centre or CALL facility. At many institutions, however, the changing nature of specialized technical support is only now being addressed due to the dramatic change in both faculty and staff computer literacy, as well as the exponential technological advances in both software and hardware. Where little assessment has been done, specialized support services and training still fall, by default, to the CALL coordinator and staff.

Though there are a wide variety approaches to providing technology training to instructors, there is a general consensus of the goals (see Kassen and Higgins, 1997). The first is to help users establish a general comfort level with the technology. Introductory workshops help to do this, but on-going support that not only revisits frequent questions and concerns but also builds on previous training has proven to be the most successful approach. Faculty, in particular, need to know that their concerns will be addressed, and that continued support is available at the institutional level. Participants are most comfortable, for example, in settings where the facilitator/participant ratio is low, and the participants know each professionally. Coordinators and facilitators frequently emphasize the need for hands-on components in general training sessions, in order to allow participants the chance to explore as well as discuss observations and uses. Participants cannot realistically do this in large settings. The primary goal is both to introduce technology and to have participants familiarize themselves with it.

The end goal, in every case, is to stir the individual's creative capacities in finding the best fit between technology, curriculum and personal teaching style, and to promote reflective thinking on that process. Integration of technology into established course curriculum and the development of critical skills are cited as the goals that best address the issues of "fit" between the technology and pedagogic concerns. An important aspect to remember when training instructors is that workshops addressing the creation and integration of technology into language courses must focus on actual projects or ideas brought to the workshop, where instructors can be guided when needed but also allowed simply to explore the feasibility of their ideas. In many cases, at least for those instructors already possessing a high comfort level with technology, developing any idea or project necessitates critical skills. Development happens before integration, but each step from planning to student use involves assessing skill levels, tools, student needs, and fit into the course curriculum. This takes practice and guidance, and plenty of reversion to previous training material.

Workshop & Training Suggestions

The following suggestions are all actual workshop and training practices that have proven to be effective in institutions around the world. The goal is, in almost every case, to address comfort level issues, provide examples and training for the integration of CALL into existing curriculum, and generally to stimulate ideas and possibilities for CALL development and use.

1) Demonstrate CALL class materials to all multi-sectional language classes at the beginning of each term. Train yourself and your staff to do this well, so that students viewing the presentation for the first time find them interesting, intelligent and entertaining. Although time consuming, this serves two purposes: it gives control to the center coordinator of all CALL materials presentation, and it profiles the center (and materials) to incoming students.

2) Develop jointly with language faculty a series of workshops aimed at teaching assistants and junior faculty that addresses a broad range of language teaching techniques. If "language teacher training" already exists, work closely with those administering the programs. These workshops place CALL staff squarely in the loop for on-going training of newer instructors. In this format, CALL materials can be integrated into the programs and showcased as everyday teaching. I see these types of workshops building confidence in inexperienced instructors by providing them with concrete examples of in-class CALL use.

3) Establish procedure and process lists or routines for various types of CALL use or development and train faculty to use them in real projects. These can be general procedures aimed at critical skills around technology, but ones that can be applied globally in any development project or even program use. I find they serve well as departure points for faculty already at a high comfort level with technology. An additional goal is to assist instructors in developing an increased

comfort level with more advanced operational procedures – the hallmark of any materials development process.

4) Develop joint projects with faculty that involve their pedagogic expertise and your instructional design and technical expertise. Once finished, showcase these projects to other faculty and staff, with the active participation of the faculty member. Provide a hands-on session after the presentation, and get participants thinking about ideas for their own projects. Instructors respond best to what their peers are doing.

5) Bring in outside presenters that your faculty would acknowledge as experts in the field. Ask the presenters to develop hands-on workshops that are relevant to the needs of your faculty. Have them create or make available interactive web-based training exercises as part of the conditions of the honorarium or get permission to do this yourself with their materials. Follow up with on-going workshops in which faculty can continue developing their ideas and projects.

## Purchasing Networks, Servers, Computers

It is important to keep in mind that at its foundation your new CALL facility will be a small piece in a greater puzzle that compromises the physical and administrative architecture of the institution. For this reason, any planning, purchasing, implementing and maintaining will require the active participation of your institution's equivalent of Facilities Management, Networking Services, Computer User Services (or Academic Computing), Purchasing and Accounting Services. All of these departments will be able to assist you in assessing space, design, network needs, budgeting possibilities, vendor interactions, tendering bids, policy creation, and procedure/code issues. At the beginning of the planning stages, inform all of these departments of your plans and develop liaisons with individuals who are available at the other end of a phone line for immediate consultation. Once plans are initiated, the construction phase will place the coordinator squarely in the position of

general contractor, and decisions will have to be made at the spur of the moment. This requires balancing the disclosure of information; working out specifics in institutional, technical or legal jargon; assessing power dynamics; and juggling administrative hurdles with the immediate need to "get things done".

Network planning necessarily begins by assessing your local network needs and comparing these with state of the institutional networking infrastructure. It is likely that your needs will be greater than those of general academic computing due to the focus on multimedia use in teaching and learning. For example, audio files need greater bandwidth (transmission speed capabilities) than text files; video files need greater bandwidth than audio files; streaming video needs more bandwidth than compressed video files – what will your network do and what do you envision it doing several years from now? Can the current institution-wide network sufficiently support what your facility is designed to do? This is important since your local network will be only as fast and as good as the slowest link in the greater networking chain. When assessing the institutional network infrastructure, read general reference materials, find institutional networking diagrams, and certainly consult with your Facilities Management and Networking Services. The proper questions to ask center around the following: network bandwidth capabilities, data routing (what paths your CALL data transmissions will follow getting around as well as to and from campus), system platforms (NT, Linux, Windows 2000) supported on campus, port availability, and network upgrade schedules. Bad decisions due to ignorance of general networking issues can be very costly, and in many cases can cause problems both in the local network and within the institutional network infrastructure. Finding out this information early and planning accordingly is very important.

Big picture networking issues also require a general understanding of network servers. Servers come in many shapes and sizes: there are file/storage servers, application servers, administrative servers, web servers, proxy servers, video servers, and more. These terms do not necessarily refer to the physical server box, but to its use. Again, what your facility will "do" will also determine what type

of server (and capacity) is required. For example, storing and serving vast amounts of audio and/or video files will require a large file/storage server, as well as an appropriate backup system. If your facility works with audio files, it would not be uncommon by today's standards to fill 60-80 gigabits of disk space in a two year span (depending on the size of your usership and the file formats used to house and serve the material). Video will require much more disk space. Many software applications, as well as web based materials, can be served on the same server. However, if your CALL facility also supports a turnkey language lab solution such as Tandberg, Sony or CAN8, then a dedicated software application server will also be required to run their software. Other considerations involve security issues – in their most basic form a student log-in/authentication system – that may require additional server needs.

As the direct interface between the user and the CALL materials, the individual computer is the most tangible technological consideration. As such, it receives an undo amount of attention by administrators financing the purchase and set up of a new facility. Most CALL coordinators, however, will tell you that it rates poorly when placed next to networks, servers, software and digital materials (not to mention user issues). In my experience I have found that the brand of computer is relatively unimportant, since many good "clones" are available at reasonable prices, and still better ones will be available before this article is even published. The computing capacity is the true measure of the computer's worth, which places it in a line of descending order from networks, servers to computer. The items in the individual computer that affect computing capacity are processing speed, RAM, disk drive and operating system software. These particular items have become increasingly important as the focus has turned away from stand-along software programs to internet use and digital multimedia, the support of which is tied to bandwidth capacity and the serving, processing and storage of media files. Replacement cycles of computers run 3 – 5 years, and these upgrades have less to do with the computer's life cycle than its computing capacity. Older computers can either be recycled or simply given more basic "duties" that they can still perform well. Support and expertise are the more important considerations, since configuring computers and

networks, creating and making available materials, and training users are usually the biggest indicators of a CALL facility's success or failure.

## The Selection Process for Software & Other CALL Materials

Robb and Susser (2000), in their article "The Life and Death of Software" examine a wide range of literature dealing with software selection, and come to the conclusion that a large gap exists between the advice given in the literature and what teachers actually do when they select courseware. Any teacher or CALL facility coordinator who has been through this process knows how true this observation is, and can likely attest to the confusion around the vast amounts of literature pointing out the many and varied methods of selecting CALL materials. Pedagogic issues are compounded by technical ones, and the line between the two often blurs when once begins to analyze what and how the various features of the software program works. Although more detailed suggestion for evaluating educational software (Reeder et al), and ESL websites (Robb & Susser) are offered elsewhere in this volume, it is important for the discussion here, to briefly consider materials selection in the context of planning and maintaining a CALL facility.

## Materials Acquisition vs. Policy Planning

Deciding on the most appropriate CALL materials for your facility can easily become a complex and burdensome affair. The best outcomes tend to be a mix of practices appropriate to the situation, along with a certain amount of flexibility. An important point, which needs to be made right from the start, is that it will be almost impossible for you to have a full selection of software available to students upon opening a new CALL facility. This takes time and sustained effort. Software programs, CD-ROMs and internet sources should all be evaluated through trial runs by staff, faculty members and students, and should strive to meet both the institution's pedagogic as well as technical goals and requirements.

Even in an existing CALL facility, all materials should be reevaluated periodically, and if deemed necessary, upgraded to compliment newer teaching methods, techniques and tools employed by the faculty, or expectations by the students. For that reason, policy issues around software planning and selection (but not necessarily the software itself) should be dealt with early in any facility planning process, and should necessarily involve administrators and faculty members whose students will use the software on a regular basis. In short, CALL materials decisions are curricula decisions, and a high level of involvement by those determining curricula, will assure both better and greater use of the materials selected, and thus better and greater use of the CALL facility as a whole.

As is the case with most budgets, "who pays for what and how" needs to be addressed at the very beginning of the process. Will the materials budget belong to the CALL facility, to the individual language units, or will it reside in a general "slush" fund for this purpose? Certainly, whoever picks up the tab will influence what the selection process looks like, who does it, and what is selected. A more concrete question related to materials planning is "to what extent will the software (and technology) be integrated directly into coursework?" An important principle to remember is that the degree to which CALL is viewed as a legitimate pedagogic tool (and used as such) will correspond directly to its level of integration into a given language curriculum.

Where possible, CALL materials should not be selected by individual criteria or brought in piecemeal, but rather as part of a well researched and developed plan in which all aspects of a course (or program) follow a defined teaching and learning strategy. In this case, however, CALL materials selection becomes quite complex because, as Gillespie and Mckee (1999) argue, "there needs to be a specific CALL strategy which is agreed and adopted by all staff on a course (or in a subject) and not left to the efforts of one or two academics and therefore seen as peripheral (p 452)." Levy (1997) adds that specific teaching strategies can be based on a variety of factors including the use of models

of second language acquisition, approaches to language learning, descriptions of teaching methodologies or theories of instructional design.

## Implementing and Evaluating CALL Materials

In practice, selecting and implementing CALL based on a comprehensive learning and teaching strategy involves identifying target skills and finding CALL materials that address these. Once the target skills are identified (preferably through some sort of needs analysis), the selection process becomes increasingly more streamlined and manageable. Concrete frameworks involving checklists, trial runs and user input can then be more easily created and tested. Programs vary in scope and presentation, yet the most exciting possibilities today lie in the realm of multimedia – both in the off-the-shelf varieties as well as in self-authoring tools for creating multimedia-based exercises. Many of these authored materials are already available on the web, created by language instructors for a wide range of uses. A simple internet search will bring a wealth of hits for such sites.

Although CALL staff will likely rate technical issues higher, and educators will focus on pedagogic features such as learner control, ease of use should receive the highest priority when considering any software selection. The stark reality is that irrespective of how many "bells and whistles" a program has, it is the programs that are easier to use that get used the most. Training, user demands, troubleshooting issues (and frustration!), are all reduced when programs are easy to use. Keep in mind, however, that materials that have a strategic place within a language curriculum – especially those to be used in-class - require more formal training for both staff and end users. Furthermore, their use will likely require "just-in-time" support whenever used in a classroom setting on multiple computers. In any learning and teaching setting that is governed by time constraints, the issues related to training, technical support and ease of use will be most likely determine whether or not faculty will continue using the materials.

One final consideration focuses on the course materials selection process, which is no longer limited to just textbooks. Publishers now vie for departmental selections using a whole range of course materials such as drill and practice computer programs, interactive multimedia programs, CD-ROMs, course web sites, chat rooms, arranged email exchanges, on-line tutoring, and video conferencing. Many institutions are also now supporting on-line classroom environments such as WebCT and Blackboard. Coordinators need to be aware when these selection committees are being formed, and attempt to participate at some level in the evaluation process. Be aware that many faculty, especially those who are more technologically savvy, may not like "canned" solutions, and prefer instead to customize their own environments.

## Technical Considerations

Technical considerations play a large role in the continued use of CALL. In practice, most CALL materials are selected based on their pedagogic merit but are discontinued because they present too many technical difficulties. Specific issues often mentioned by technical staff include: slow or difficult installation, network bugs, size of program, poor tech support from company, slow loading web sites, and incompatibilities with certain computer operating systems (Windows 95 vs. Windows 2000, for example). Students and educators, on the other hand, tend to cite difficulties centered around program features such as: an inability to pick up where they left off when revisiting a program, an inability to send results to an email address, a poor navigational structure, or a lack of learner control or customizable options in the program. Again, using evaluation checklists and a defined framework during trial runs certainly help with these issues, especially around program features. However, I recommend remaining flexible and open to exploration, as checklists can never fully accommodate the full range of pedagogic and technical considerations displayed by a given program or web site.

Network and version compatibility issues are usually discovered only after continued use. CALL Staff meetings should address checklist or framework issues, and honing those aspects of the trial process will happen only with experience and time. Faculty should be made aware that, even though a trial run may have been successful, technical difficulties may arise once the program is placed on the network, and the CALL coordinator should reserve the right to discontinue the program at a certain juncture if there are excessive technical difficulties. Many a conflict has arisen over this very issue because educators often do not understand the complexity of computer networks, and may not "see" the problem when using the program. Who does this and/or how these decisions are made should be addressed and made clear in the planning process.

## Materials Development for Online CALL

The evolution of on-line materials development in most CALL facilities has, in the past, been an organic process, originating out of practical concerns around providing good, supplemental materials to students, addressing overcrowding of the physical CALL space and granting students greater access to materials from different locations. This trend has only increased. Teachers, for one, have become more intrigued with the learning possibilities for their students as a broad range of self-authoring tools have come available, and as both networks and computers have grown in capacity to support the developed materials once placed on the web. Studies show that students, as the end users, respond more favorably to materials authored by their own instructors (Pederson, 1988). This explosion in availability of "easy to use" authoring tools, as Levy points out, can be attributed directly to the author's ability to customize materials for their students, in contrast to the commercially-produced programs, which inherently cannot respond to "significant learner characteristics or major contextual factors" at any given institution (1997, p.91). Understandably, on-line learning materials development is perhaps the fastest growing area of CALL, and greater attention should be given it than ever when planning and setting up a CALL facility.

At its foundation, any development process, be it a textbook or a web site, is a cooperative effort between the author and the medium. In light of the innovations afforded by hypertext and digital multimedia, certain limitations of textbooks, long unrecognized as such, are only recently becoming apparent. Newer technologies, on the other hand, exhibit their own limitations, namely what the programming languages, authoring tools and computers themselves, can and cannot do when developing and delivering learning materials. Language instructors, for example, typically bring to the development process an inclination toward a particular language learning methodology, and likely will choose to support its application when authoring materials. If the instructor supports highly communicative methodologies and wishes primarily to simulate authentic language exchanges via computer, he will quickly discover that computers cannot do this, and that to approximate this exchange in a practical manner would require vast amounts of time, funding and programming expertise.

The degree to which the pedagogic goal of the learning materials correspond to the technology's capability to support it is commonly referred to by developers as the "fit". The first practical step in determining the fit is to assess and understand which uses of technology best support the pedagogic goal of the project. This is, in truth, no easy task, because both the technology and the creative possibilities with it are dynamic and complex, and depend greatly on the level of expertise of those involved with the project. On a relatively simple level, the technology may be a selected software authoring tool, in which case an assessment necessarily involves the range of authoring features provided to the author-to-be, as well as the degree of interactivity afforded to the end user once the materials are developed. Making an appropriate selection here is important, since the developers of the various authoring tools possess their own pedagogic inclinations – explicitly stated or not, but usually evident through simple evaluation of the program's interface design and the features provided or not provided. For obvious reasons, the instructor will want find an authoring tool whose pedagogic design fits with his or her own inclinations. A good place to start is the CALICO Review,

http://astro.temple.edu/~jburston/CALICO/index.htm, which offers a wide range of critical reviews on language software and authoring tools.

In another instance, the technology may involve a host of development tools and a highly customized design, the consideration of which is possible because a team of developers with expertise in various programming languages and graphic design is in place for project support. If this is the case, the instructor can think on a different scale for the project – one appropriate to the resources available – and will be afforded much more flexibility in design and face fewer limitations that may compromise the initial conception. The fit here necessarily involves other issues such as time, funding and expertise, all of which instructors rate as the leading impediments to initiating CALL projects (Levy, 1997). The instructor can rely on the experts for the technological assessment and development, and focus his or her energies primarily on the creation of content. Budget permitting, this model is ideal, since each team member can do what they do best.

At this point, the notion of "fit" must be expanded to include the needs and attributes of the users, which, when combined, often becomes the most crucial element determining the successful use of the project. In many cases, these needs are based on known quantities or conditions, such as a specific learning activity identified by the course instructor, the creation of which is done on a small scale to fill in a particular gap in the curriculum. Even at this level, students generally expect that the learning principles and presentation of the activity will be consistent with those in the textbook or those that are emphasized in the course. Greater attention must be paid to learner attributes in large scale developments such as comprehensive language tutorials, which tend to address reading and listening comprehension, and/or focus on a variety of grammatical components, usually through a series of multiple choice, cloze, word order and short answer exercises. For example, lower-level learners accustomed to teacher-driven learning may find strong tutorial guidance and rigid parameters quite helpful, but those with a good command of the language learning process, as well as the computer control process, will likely want to employ a wider range of discovery strategies. Discovery strategies range from interesting "hint" options, to glossaries, help menus, and thoughtful

feedback from the instructor. Self-evaluation options have also proven to be quite motivating for students. In summary, students without ways to explore learning possibilities are less likely to complete the exercises, and tend either to discontinue using the materials, or to use it only mechanically by resorting to the "show answer" components more readily than they should. The vast majority of instructors and CALL developers now seem to recognize that students will learn the material better, regardless of the implicit pedagogic goals, on web sites they enjoy using.

Having considered the issues, it is also important to briefly review actual practices and models. Project development at some institutions is a highly defined process that coordinates all the steps from initial concept to final product, by identifying and implementing in a structured manner the various elements including needs analysis, task breakdowns, learning objectives, learner characteristics, instructional design, media selection, and evaluation. At other institutions, the development is less formally structured, more spontaneous in nature, adjusting along the way to the lessons learned at the completion of each stage, with ample consideration given to feedback from students and colleagues (see Levy, 1999, pp.83 – 107 for a more detailed discussion of this topic). To one degree or another, the initial development phase after planning involves the creation of a prototype on which to base the project as a whole. Often the prototype is the first unit in a multi-unit endeavor, created primarily to help test and evaluate items such as fit, instructional design, navigational structure, number and format of exercise templates, input data routines, and the ever important user feedback. Much of the creative work is done here, so that the developers can commit themselves with confidence to the remainder of the project. Another practical outcome of this approach is that students and graduate assistants can then use the models, templates and routines to do much of the subsequent work. Training, supervision of tasks, progress assessment and management issues then become the primary considerations. Evaluation and testing on computers, servers and networks, plus further attention to user feedback, is often the last phase of the project, and requires the whole team’s participation.

Arguments are being made at all levels by both administrators and technology proponents that a wide variety of language learning needs can be better served in a virtual environment than in a computer classroom. Many campuses now have central fileservers and fast network infrastructure that connect computer labs, classrooms, libraries, and dorms. Web-based interactive grammar, vocabulary and reading exercises; textbook accompanied materials; and even assignments based on short audio/video clips can be placed on media servers and served remotely, so that students have no need to attend a dedicated facility. Results of student on-line assignments (and even on-line tests) can be sent via email or FTP directly to instructors, thus making required lab attendance obsolete. Publishers now provide web sites, web-based exercises, and chat rooms that can be accessed from anywhere by students enrolled in courses. With access limitations removed, students and faculty have greater control of their own schedules, and can choose to work from any place at any time, providing the network infrastructure is in place to support this.

For many, though, the very identity of the CALL facility is being threatened. As Garrett (1997) and Yang (2000) both note, physical space proponents need to be able to articulate their arguments for their continued existence on both technical realities and as well as pedagogic considerations.

Technical realities are, in a sense, easier to articulate since the issues involved appear to be more concrete. First, it is important to realize that many of the above arguments for a virtual classroom arose out of the simple need to address the overcrowding that often occurs in physical centers. Unfortunately, most virtual classroom proponents tend to overestimate what is possible as they get mesmerized with the promise of what new technologies can offer. For example, the reality of what is possible can change quite dramatically when user needs enter into the picture. Issues such as configuring computers for special fonts and plug-ins (especially for non-Western languages), the higher quality and speed of audio and video on local networks (vs. remote access via the internet),

and the on-going questions regarding both technical and instructional assistance, all seem to be considerably better supported within a physical center. Furthermore, activities that require team project work (web-based and other), hands-on training and workshops, research into teaching and learning, as well as project development with both students and faculty can realistically only be supported within a physical center.

Pedagogic considerations are, by their very nature, less definable and can thus seem less concrete, especially with user outcome studies and other research often showing mixed results. However one views the arguments, though, there does appear to be a general consensus by CALL proponents that the pedagogic value of CALL is best served when CALL is integrated directly into course curricula. Introductions and explanations of materials must be prepared, and communicative exchanges must coordinate with pre- and post- communicative CALL related activities. Yang (2000), a physical space proponent who addresses many of the issues discussed here, strongly criticizes the majority of current out-of-class web-based instruction in which the computer program replaces the role of the instructor. He argues that although such programs have many positive uses as teaching tools, which can help fill specific curricula gaps, they should never play the role of an instructor (as they necessarily do in the absence of the instructor). According to this line of reasoning, a physical space would be required for most CALL materials and for any in-class use where a range of activities take place within a given session, and where students might need hands-on access to CALL materials (which is the case with any language teaching and learning environment).

The most powerful argument for having a physical rather than virtual center is also the least tangible. At issue here is the perception that administrators have about CALL centers. The issue is simple: students do not come to the CALL facility to use technology (as many administrators believe), they come to learn languages. The facility must become a center for it to be successful. Language learning is social interaction (Canale and Swain, 1980, Fillmore, 1979); language learning is community building.

In the long experience I have had working in and observing CALL labs around the world, one "intangible" that seems to be consistently true is that CALL labs which cater to the social aspects of learning (both formal and informal), are much more successful than CALL labs that focus more strictly on technological solutions to learning. Observe any CALL lab that provides ample space for individual and group study, student lounges for relaxation, and comfortable seating arrangements, and you will likely find a constant stream of students, using the technology or not, as their preferences and needs dictate. Aside from computing related activities, they receive tutoring, do language exchanges, study textbooks, and generally enjoy being as immersed as possible in a dedicated learning environment. Actually, planning for this aspect of your center is one of the most important challenges you will face, because, to put it simply, if students do not like it, they will not use it.

The untold truth is that many administrators unfamiliar with the complexities of language learning view "virtual" labs as a practical solution when faced with the financial commitments required to staff and run a CALL facility or train language faculty. If technology, not learning, is the sole issue, then it will be difficult to convince an administrator with a budgetary mindset that a physical center is essential. Try to emphasize the complementary role of virtual and physical spaces, and approach the process with learning and teaching as the central argument, rather than technology.

## The Turnkey CALL Laboratory

Turnkey language labs refer to comprehensive language learning technology systems – also known as “solutions”-- offered by such companies such as Tandberg, Sony, and CAN8, to name a few. In the past, these systems were associated with the Audio-Lingual Method (discussed, for example, in Richards and Rogers, 1986), and were comprised of various hardware components such as a master

console and student cassette recorders, linked together via a network of audio cables, that provided a full range of features allowing for multiple configurations for individual, pair, and group work.

To one degree or another, the manufacturers of these systems have now embraced the digital era, and are producing what are called "hybrid" systems, because they support both digital and analog technologies, and operate over both standard computer networks (software based) and dedicated audio networks (hardware based). Most of the hybrid systems provide the same range of functions as their analog predecessors, but have added databases to assist in class set-up and easy access to materials, tracking devices, and authoring tools. Some manufacturers offer, instead of a complete package, component or modular packages based mainly on whether the lab is teacher-driven (classroom) or student-driven (drop-in facility). Most provide a range of separate components that deal exclusively with video distribution, since the bandwidth capabilities over the majority of computer networks cannot support real-time, simultaneous video distribution to more than a few stations at a time. In every case, however, the new "look and feel" of the hybrid systems is completely digital, since the manufacturers have gone to great lengths to integrate seamlessly the analog components, and both instructors and students see only computer monitors displaying a virtual master console interface and virtual student recorders.

To my knowledge, all of these systems are designed to run on Windows based systems only (no MacIntosh versions are yet available), and require little more than point-and-click input to operate the features. Across the board, the network specifications regarding bandwidth, RAM and drive storage capacity are far from demanding, and an average computer can now act as student station, master station, and even the dedicated application server needed to serve the software. All of these systems, however, require a large storage/file server, to handle the vast amounts of audio files that accumulate quickly, and the same is true for student station hard drives if students are allowed to store the audio and video files locally. Careful planning, back-up of materials, and scheduled deleting of non-essential files can extend server and storage capacity. Video files can also be

transmitted, which as far as these systems are concerned (insofar as the system supports the particular file format), operate like any other file. At this point in time, the real limitation is the network bandwidth capacity, not the turnkey lab itself.

It may be that the "hybrid" systems will eventually disappear in this transition period of analog to digital and physical to virtual. This is no small consideration when planning a purchase of this magnitude and commitment. Some manufacturers now claim to have created completely digital systems that do everything their predecessors did, conquering the hurdle of exchanging of two way audio in real time over internet protocols. The internet protocol (IP) was not designed to support two way, real-time audio transmission, and a noticeable lag (and poor quality and at times interference) usually occurs between speaker and receiver, creating an interaction between teacher and student in a classroom setting that most would consider unacceptable. Analog technologies over dedicated audio cables (placed squarely within four walls) still do this far better. Consider, however, that students and teachers communicating from remote locations need not worry as much about this problem, and once quality and stability of voice over IP improves, possibilities open up greatly for use of turnkey solutions that emphasize remote access capabilities.

The three primary arguments vendors use to sell these systems revolve around simplicity of use, the analog to digital capabilities including media players that support a vast array of file formats, and the synchronous audio distribution possibilities. Many administrators and educators instinctively gravitate towards this one system fits all approach, and are quite willing to lay out large capital expenses, knowing the solution comes completely installed, with some initial training and ongoing servicing provided, thus requiring relatively low maintenance on top of that already required to support the computer network. There is merit to this, and by and large these systems do deliver technically what they promise.

The question remains, however, whether the large price tag of turnkey solutions is justified, and whether such a solution is needed or will be used. For one, a close inspection of the vast amount of both hardware and software products on the market shows that many turnkey features can be replicated at a relative fraction of the cost of a complete "solution". This was not the case five to ten years ago. Secondly, many CALL coordinators and lab directors notice that the majority of turnkey features rarely get used by instructors, due primarily to the lack of on-going training and pedagogic development around the technology. Time, advancement incentives and expertise are usually to blame here, since creating good materials (beyond simple digitized files) and providing technical training to use them is difficult and time-consuming. To complicate matters, instructors are rarely adequately recognized by their superiors for this type of work. The CALL coordinator will need to be able to negotiate features and components, in order to get only the features needed and avoid paying for expensive items that may never be used, as well as address the many issues around training and developing materials.

Keep in mind that turnkey solutions now operate solely on Windows based operating systems, so a computer network (including a knowledgeable technical staff) will be required in addition to the actual turnkey solution. This not only multiplies the cost of the solution but also brings up other issues around scheduled use of facility, training of staff and users, software compatibility, and network maintenance.

A thorough needs assessment of users and equally thorough product assessment of equipment is the best way to address the many issues around deciding on a turnkey solution. This includes visiting facilities that have these systems in place, consulting with as many users as possible, and providing multiple vendor demonstrations to your faculty and staff (vendors are usually willing to give very in-depth demonstrations as the amount of money involved in the purchase is extremely high). The assessment, planning and acquisition process is necessarily long, at times tedious, and certainly expensive. After installation, there will be bugs, especially in a newly installed computer facility, and

things like user training, analog to digital conversions, and materials development are all on-going. Be prepared to start a year in advance, in order to hone arguments and make solid recommendations, then be prepared to continue assessing use and training users for the duration of the system's use.

## Digitalizating CALL Materials

All existing CALL facilities and language labs have legacy libraries consisting of hundreds or even thousands of archived analog audio and video materials, some of which still get used regularly, many of which do not. Future CALL facilities will necessarily have to balance the commitment to both analog and digital resources, since analog is still used frequently even as digital becomes the state-of-the-art choice for new media. CALL proponents find themselves squarely in a transition period, complete with the on-going debate about the quality of each, the conversion process, and the technological as well as pedagogic implications of "going digital".

CALL development in the last few years has made its greatest strides in its ability to exploit multimedia for pedagogic use. Greater network capacity, the proliferation of good, simple to use authoring tools, and the WWW have made it possible to use multimedia in any number of ways on computer networks. In truth, newer facilities can choose to dispense with analog technology altogether, and focus solely on digital multimedia in both its pedagogic development in-house, and/or in purchasing materials off the shelf. In doing so, however, the administrative and technical requirements become quite substantial.

Copyright laws, for example, are often still a "grey area" when dealing with educational use of materials, digital or not. Materials that must be converted from analog to digital should be assessed beforehand for copyright clearance, since converting means changing the form of the media, and most likely providing a different method of access for users. Placing audio/video files on the web, for example, require security measures, likely based on a course ID number, student username and

password, so that only enrolled students can access the materials. Who will digitize the materials, and how? Often, when CALL staff digitize materials, instructors are unhappy with the editing scheme, and want things redone to their specifications. Instructors, however, rarely want to spend the time to do it themselves. It is important to work out these issues beforehand, as a great deal of time will be spent digitizing, editing and developing materials. The digitizing process works in real time only, so be prepared in terms of staffing for a labor-intensive job, requiring long spans of time sitting at the digitizing station(s).

A fully digital facility is indeed high-tech, and high tech requires more planning, development, expertise and maintenance. More things can go wrong, and troubleshooting issues are substantial. User training needs are high, and there will be more resistance (as well as anxiety) to technology that is not yet widely recognizable. Again, it is wise to maintain a good balance between high tech and low tech, between the ideal and the realistic.

## Conclusion

Still overwhelmed? Although it is true that the issues involved in setting up and maintaining a CALL facility are numerous, complex, and often time-consuming, the information and advice offered in this chapter can be boiled down to just a few key principles:

1) Clearly identify the specific needs of your students and faculty. Not only does this prove beneficial by involving the faculty and students at an early stage in the planning process, it also serves the interest of administrators whose job it is to make good, informed decisions.

2) Devote a large portion of your budget to full and part time staff, and on-going training for faculty and students. Given the fact that the technology is changing more rapidly than ever, having proper staff and training in place is all the more necessary for the continued life of the facility. A proper needs analysis will likely bring you to this same conclusion.

3) Hi-tech solutions are not always the ones that are best for your institution. More advanced technology brings with it the need for more frequent and complex training, as well as greater user-end and technical support demands. When thinking "technically", pay attention to computing capacity rather than computers, which necessarily begins with the greater institutional networking architecture and moves in descending order to local networks, servers and computers.

4) Pay attention to ergonomic and task-based factors when designing the facility. These factors often boil down to two issues: comfort and functionality. A comfortable and highly functional facility will bring the users in, keep them there longer, and bring them back again.

5) Focus on the people using the facility rather than technological issues alone - "people-friendly" labs get used more. Try to create a dedicated learning environment rather than just a computing facility by adding study spaces, student lounge areas, and special events. Emphasize the complimentary role between virtual and physical spaces and how both are needed for a language learning environment.

6) Plan for transition. Newer facilities can address CALL transition issues more readily than older facilities, by paying attention foremost to digital and multimedia possibilities, and by considering in-house materials development. Properly assess turnkey solutions and involve faculty and students in the process.

By staying focused on these larger issues, you will be less likely to be sidetracked by the many competing interests that will vie for your time and budget. The potential benefits of a well run CALL facility for students and faculty are enormous.

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