Computer-Enhanced Language Instruction
The integration of technology into the ESL classroom

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Introduction

ESL instructors now find themselves making decisions regarding the introduction and implementation of new technologies into the ESL classroom. Unfortunately, few ESL instructors have had the opportunity to see how those technologies might be successfully integrated with their own preferred teaching styles and philosophies, and so, it is extremely difficult to make informed choices. This paper will cover some of the conditions that will assure affective implementation of computer technology into the ESL classroom.

This author also hopes to encourage ESL instructors with little or no experience with computers to opt for conducting their ESL classes in computer labs and/or computerized classrooms. There are many ways in which computers can be used for language instruction that do not require a high level of computer expertise or specialized ESL software. To briefly mention some options, there are: pen-pal exchanges over the Internet, as well as participation on student discussion lists; writing assignments can be done on computer (for those having access to word processing software); use of popular multimedia CD-ROMS (English versions) on everything from games to interactive magazines; and more. Furthermore, this author contends that ESL instructors should be developing their own ESL software, and while this might have been extremely difficult and time consuming before, there are a number of excellent authoring packages presently on the market which make the task of creating software much easier and quicker than many might think. Owing to the ease of use of these authoring packages and the expanding capabilities of the common personal computer, there is no reason why ESL professionals can not develop their own software.

CELI—Computer-Enhanced Language Instruction

In this discussion on computers and ESL, the first problem we come to is one of terminology. There are a number of expressions (and their acronyms) used to describe the integration of computers into the foreign language classroom, for example: Computer-Assisted Language Learning (CALL), Computer-Assisted Instruction (CAI), and Computer-Assisted Language Instruction (CALI), just to mention a few. I will be using the label 'Computer

-Enhanced Language Instruction' (CELI) to cover a wider definition than what is commonly referred to as CALL and CAI. Computer-Enhance Language Instruction (CELI) will be defined here as any use of computers in the context of foreign/second language instruction which encourages language acquisition/learning.

What exactly is meant by the term 'Computer-Enhanced?' In order to illustrate this distinction, a photo can be computer-enhanced allowing us to see more of what is in the photo than normally possible without the enhancement. Likewise, computer-enhanced language instruction should allow teachers and learners to do more than what is normally possible in the classroom, and hopefully, do it faster and more efficiently. One example of this would be a networked computer lab where students can communicate with their peers locally as well as with other people from around the globe via e-mail or electronic forums —something which is not possible in the traditional classroom. Also, consider how a book compares to the newer developments in multimedia. Books are limited to the written text and static graphics. However, much of the new multimedia software on CD-ROM combines text, sound, and video clips into one integrated package—in other words, the same material that might well be contained in a book is enhanced with the addition of sound, moving pictures, and sometimes much more. For the language learner, multimedia offers a richer source of input consisting of both linguistic and non-linguistic clues which should promote a more rapid acquisition of the target language.

This definition of CELI allows for the widest possible range of options to both teachers and learners. This means that software not normally associated with language learning and instruction can be utilized as well as software designed specifically for language learning (ESL software). Many types of commercial applications—everything from word processors to adventure games—can be used in such a way as to encourage language production and/or language acquisition. One person expressed this thought as follows:

> I think I don't like the term 'CALL software'... What I mean is that anything one uses to assist in language learning is, to me, 'CALL software'; thus, the term is meaningless. (Taylor, 1994)

Also, if we have to place a label on what is essentially ESL software and what isn't, then we also have to consider those packages which can and are used by ESL instructors, but not necessary used by students. For example, there are six U.K. newspapers and 43 U.S. newspapers now available on CD-ROM. (Seedhouse, 1994) Any of these packages would be an excellent resource for ESL instructors. The weekly magazine 'Newsweek' is also available in an interactive format on CD-ROM. It is important to note that these products were not initially developed for the purposes of language instruction, but certainly can be used for

ESL purposes.

Finally, this definition of CELI allows for a wide range of activities in the computerized classroom or computer lab, from what we might call 'low-tech' approaches to the full-blown, carefully planned CALL packages developed by the experts. However, it is extremely important that ESL instructors with limited or no computer expertise be provided the opportunity to participate and conduct classes in computerized classrooms using methods which they feel comfortable with. Without having such an open-door policy, it is doubtful that sufficient demand can be generated to convince school administrators to allocate the necessary funds for the creation, maintenance, and expansion of these expensive facilities. Also, without positive encouragement coming from teachers, it is doubtful that students will be convinced of the effectiveness of these computerized approaches.

The CELI Environment—Internet Access

In the discussion that follows, I will refer to the CELI environment as any computer facility or computerized classroom which can be used for foreign language instruction. Ideally, the CELI environment should be networked, both locally and connected directly to the Internet. I would like to stress that Internet access is vital as it opens up a number of valuable options to both teachers and students. The next section will briefly describe some of the benefits associated with Internet access.

The Basics: Teachers on the Internet

In the past, many specialists, researchers, and educators did much of their work in relative isolation due to geographical separation, etc. It was difficult for these specialists to share information with other experts in their same field of research. The Internet now provides the means for researchers, specialists, and educators from around the globe to communicate with one another quickly, and seemingly effortlessly. This is one of the most important and recognizable benefits the Internet has brought to world of education.

Literally thousands of electronic forums and/or discussion lists have been set up around the globe covering academic discussions on almost any subject. Generally, these lists are accessed by e-mail, and in most cases subscriptions are free. For those without direct Internet access, it is necessary to sign up with some local commercial network, such as NiftyServe or Asahi-NET in order to establish a personal e-mail address, and thus gain access to the nets. In such case, the only real cost to the subscriber is the time spent connected to the local network while downloading e-mail.

ESL professionals can also benefit by participating on a number of electronic forums and

discussion lists on the Internet via e-mail. One list dedicated exclusively to ESL matters is called TESL-L managed by the City University of New York. Initially, members subscribe to the list by sending their subscription request via e-mail, and then soon begin receiving copies of all postings or messages directed to the list (as e-mail). In this way, members can join into discussions by sending their own contributions to the list which are forwarded on to all subscribers, who then respond back with their own comments. Other branches of TESL -L include:

TESLCA-L (Computer Assisted Language Learning)
TESLIE-L (Intensive English Program Administration and Teaching)
TESLJB-L (Jobs, Job Announcements, and Employment Issues)
TESLIT-L (Literacy and Adult Education)
TESLMW-L (Materials Writers and Materials Writing)
TESLFF-L (Fluency First and Whole Language Pedagogy)

To subscribe to any of the above lists, all that is required is a one-line message sent by e -mail to LISTSERV@CUNYVM.CUNY.EDU with the command: subscribe listname first -name last-name. (E.g SUB TESL-L Bill Clinton.)

Another item of interest for ESL professionals is TESL-EJ out of Berkeley. This is not a discussion list, but rather an electronic journal. Whenever a new issue comes out, subscribers receive the table of contents and abstracts of each article, along with instructions on how to download the full articles via e-mail. Decide on which articles you want, send off your request, and in less than an hour, you will have the article (as e-mail) in your mailbox. (To join TESLEJ-L, send your message to LISTSERV@CMSA.BERKELEY. EDU containing the following command: sub TESLEJ-L first-name last-name.)

Recently, the Japan Association of Language Teachers (JALT) has also started up its own discussion list called JALTCALL. Although the name might sound as though the list is dedicated to issues on CALL, this list is open to general discussion on most any topic related to language teaching. To join JALTCALL, send a message to MAJORDOMO@CLC. HYPER. CHUBU. AC. JP containing the command: sub JALTCALL. (This is not a LISTSERV, so do not add your name in the SUBSCRIBE command line as in the previous examples.)

There are a number of other non-academic electronic lists or forums which might be of interest to ESL professionals. Two of these are:

WORDS-L WORDS-L@UGA. BITNET
HUMOR HUMOR@UGA. BITNET

WORDS-L is a general discussion list in English. HUMOR is dedicated entirely to humor

(i.e., jokes, funny stories, etc.) Although these two lists do not provide scholarly or academic discussion in the field of ESL, they could provide sources of interesting and authentic English to be used in classes, or just to be enjoyed for what they are. (Send your subscription to LISTSERV@UGA. BITNET.)

The Basics: Students on the Internet

Our more capable students can also benefit from direct Internet access. Aside from pen-pal exchanges via e-mail and classroom exchanges, a number of student discussion lists have been set up. La Trobe University in Australia offers several. These provide a forum for cross-cultural discussion and writing practice for college and university students of English as a foreign or second language:

CHAT-SL Student ESL/ESL General Discussion List (Low level)
DISCUSS-SL Student ESL/ESL General Discussion List (High level)
ENGL-SL Student ESL/ESL Discussion List on Learning English
EVENT-SL Student ESL/ESL Discussion List on Current Events
MOVIE-SL Student ESL/ESL Discussion List on the Cinema
MUSIC-SL Student ESL/ESL Discussion List on Music
SPORT-SL Student ESL/ESL Discussion List on Sports

To join one (or more) of the above lists, students should send their message to MAJORDOMO@LATROBE. EDU. AU containing the following command: subscribe 'LISTNAME' —substituting the desired list for 'listname'.

To subscribe to multiple lists, additional subscribe command lines may be added, but only one command per line. Please note that the 'listname' must be typed in capitals, and for these lists, no personal name is required in the subscribe command line. Further information on these student forums can be obtained by sending a blank message to: ANNOUNCE-SL @LATROBE. EDU. AU.)

Although the idea of using student discussion lists as a classroom activity might first appear as rather unstructured or risky from a pedagogical point of view, there are a number of things the teacher can do in order to turn this into a controlled learning situation. To start, students will need to learn (or practice) how to write clearly, concisely and to the point. This means that students should be able to express themselves in short, well-written paragraphs. As many discussion lists place limits on the length of messages appearing on the list, students should practice expressing their opinions in two or three short paragraphs—a task that is not always easy. Hopefully, postings already appearing on the lists can serve as models—students might be asked to write summaries of longer postings, or to rewrite

selected sample postings in their own words. Groups of students might be asked to discuss, and then prepare short messages of their own to add to the discussion list, and so on. Students also need to be aware of proper etiquette ('netiquette'), and practice at composing messages or rebuttals which will not cause offense to others on the network. A considerable amount of time in the classroom can be devoted to this alone, covering everything from the use of profanity to matters of appropriateness.

Prior to allowing large groups of students to subscribe to such lists, teachers should be sure to investigate whether the students' mailboxes can hold 50-100 pieces of mail. Undelivered mail is recorded as an error back at the originating mail server, and a rash of errors (due to undeliverable mail) could result in all students at a 'problem' site being removed from the list. Teachers should also make sure that students know the difference between sending messages to the LISTSERV and the discussion list. Errant LISTSERV commands sent to the discussion list (and vice versa) are a source of irritation to the list's management. Finally, it is always a good idea to investigate, ask questions and obtain advice from the experts before launching into such types of projects.

As mentioned above, student participation on discussion lists will require a certain level of proficiency in the English language, but for those students who can manage it, discussion lists provide an excellent opportunity to furthering language skills.

Finally, participation on a discussion list does not require any advanced computer expertise, either for teachers or students. What is required however, is the ability to grasp meaning from reading and to express oneself succinctly through writing. These abilities are common goals of many ESL courses at the college level, and will remain the primary focus of any of the activities which utilize the electronic forums and discussions lists on the Internet in the context of language instruction.

The CELI Environment—The Local Network

In my definition of CELI (Computer Enhanced Language Instruction), I stated that any software package or any computer configuration which can be used in such a way as to encourage language acquisition/learning should be considered as a potential component of CELI. Locally networked computers offer a whole other range of unique possibilities.

Network-Based Classrooms

In the book *Network-Based Classrooms* (Bruce, Peyton, & Batson, 1993), there is a detailed presentation of how locally networked computers can be used for writing instruction. This approach has been labeled ENFI (Electronic Networks for Interaction) and was

developed originally for deaf students at Gallaudet University in 1985. Over the years, this approach has been adopted for the hearing as well, and although the focus of the book is on writing instruction to native speakers (using their native language), many of the same considerations might apply equally well to ESL.

> The vision for ENFI was for a transformed classroom—a classroom in which all communication occurs in writing, on a computer; a classroom in which writing has the power of conversation, done for real purposes and for real audiences; a classroom in which the teacher is not the center of attention, but a member of a learning and writing community, a facilitator; a classroom in which students have equal access to the ongoing discussion and participate equally. (Peyton & Bruce, 1993)

In brief, the ENFI environment consists of a classroom (or classrooms) of networked computers. On the screen of each computer there are two windows: a smaller window in which the student at the keyboard composes messages; and a larger window where all the messages from the other students on the network are displayed.

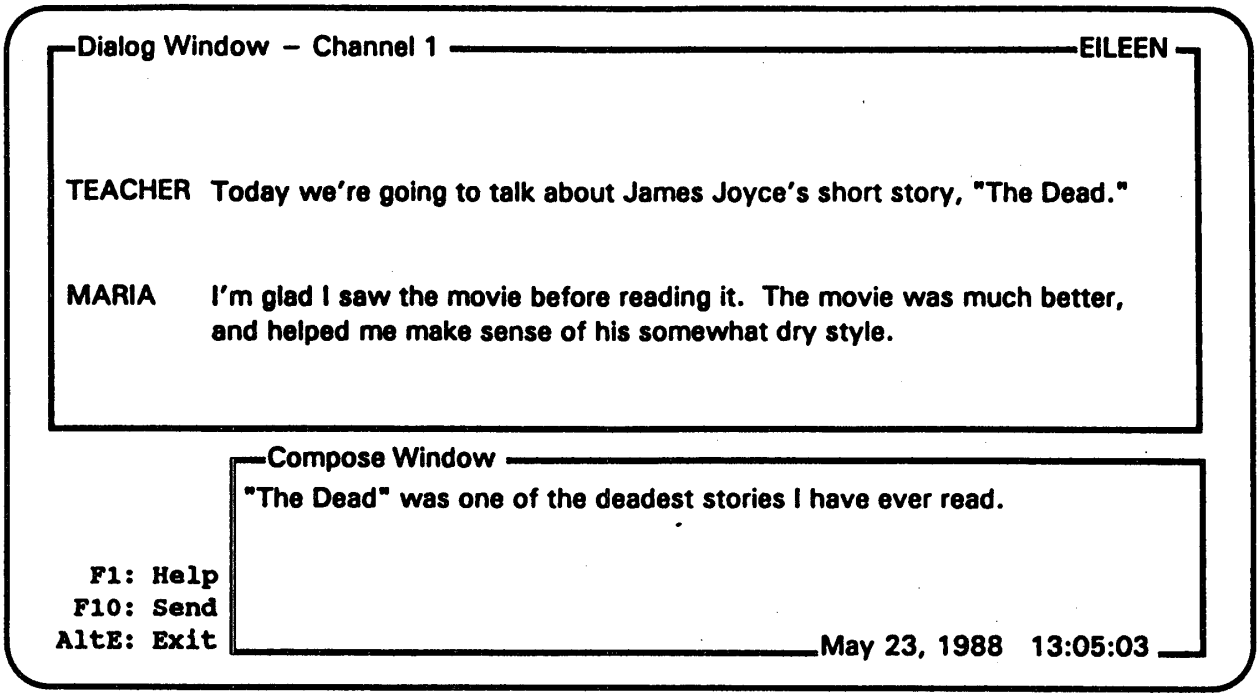

Figure 1. The ENFI computer scceen

For discussions, each student composes a message which is then relayed to each of the other networked computers to be read by the other students, who can then add further contributions to the ongoing discussion. The larger, dialog window allows scrolling so that

students can look back over previous comments as the discussion progresses. In a sense, this is the same as what goes on in a discussion list like the TESL-L mentioned above, except that this discussion is on-line with everyone participating within a specific time frame.

The ENFI developers list seven different families of activities as part of this overall approach: (Peyton & Bruce, 1993)

A. Discussion
B. Role playing
C. Response to student writing
D. Language games
E. Collaborative text production
F. Distributed text
G. Distance networking

Each of these families can be further broken down into more specified activities. Under 'Discussion' we find: 1) Open discussions; 2) Cross-age or Cross-level tutoring; 3) Confrontation of issues; 4) Analysis of data; 5) Discussion of texts; 6) Therapeutic discourse; 7) Brainstorming and Prewriting.

It is easy to imagine a wide range of options available to teachers using this type of system. For example, instead of an open discussion with all students in the lab participating, smaller groups of three or four students each might be linked up to form any number of mini networks or mini discussion groups. Usually with cross-level tutoring, students at two completely different levels (e.g., senior high school students and junior high school students) would be interacting with the higher-level students acting as tutors for the lower-level students. This concept can be adapted to work in a single computer lab by employing the more capable students as teachers' aids to guide weaker students through a specific set of drills. In a guided discussion, a theme would be provided to initiate some activity, and then students working in pairs or in groups (rather than each student working individually) would be required to respond with full paragraph-length posting(s). In this last scenario, the activity is designed to encourage an active exchange in the TL using both the spoken and written language—each student has to first share his/her ideas with his/her partner(s) in order to work together and formulate a message which is then sent to the rest of the class for an on-line discussion.

Briefly, I have listed how a number of variations are possible within a single family of activities to hint at the enormous potential provided by this one approach and/or one package. With such a wide variety of options, each individual teacher can opt for those activities which he/she feels most comfortable with and which matches his/her own personal

teaching philosophy. More importantly, once such a system is set up, ESL teachers with little computer expertise should be able to participate comfortably since the focus is on the interaction with the students and between students, rather than on the development of specific computer skills such as programming, authoring, or scripting.

The only basic computer-related skill required of our students is the ability to type, and it is doubtful that many of our students are skilled typists. This inability to type should not in itself disqualify students from the activities using networked computers—activities can be designed in such a way as to minimize the amount of typing, at least until the students have had a chance to develop their typing ability. Again, the definition of CELI stated previously allows students to use software which was not originally designed for ESL purposes, such as typing programs. Typing practice can play a part in language learning, and there are a number of excellent typing programs on the market. A few of these include: 'Mavis Beacon Teaches Typing' (on CD-ROM), 'Typing Tutor', 'Mario Teaches Typing', among others. Our goal is to help our students develop the ability to communicate information, ideas, and opinions in English, and this does not restrict students from using spell checkers, grammar checkers, dictionaries, or whatever other tools are at hand. Another posting off the network echoes this sentiment:

> The value of a computer lab for ESL students extends far beyond the explicit ESL teaching software that can be assigned as part of a course. In fact, as I have often pointed out, the explicit instructional software is often the weak link of the computer lab because ESL software tends to be either graphically unimaginative and pedagogically retrograde or graphically captivating and pedagogically retrograde. There are VERY few computer programs out there which combine real vision in instructional design AND true exploitation of the technological potential of the computer.
>
> On the other hand, when students use the computer to learn typing and word processing, or any other transferable skill, they are acquiring new dimensions of using language in the real world that can make a real difference to them in the real world of education. (Ross, 1994)

The CELI Environment—Platform Wars

To finish this discussion on the CELI environment, I would like to offer a quote taken from a personal letter I received over e-mail. It briefly describes a networked-based classroom from a technical point of view, and introduces another important consideration:

> Any useful lab will have to be networked. Every network has a server. By

> choosing a very powerful server you avoid hassles, and a good server will communicate with both IBM subsystems, Macintosh, etc. The learning center should be accessible from other existing networks in the building (first) and then to outside users (from home). To facilitate this all existing servers (Mac, IBM, etc.) should be placed in the same room; linked to a master server via fiber optic cable. The students in the Mac labs will be able to work with their Macs, and the IBMers with their PCs etc. This master server will be connected to a router hooked up directly to the Internet and other worldwide systems. All components will be compatible (through the central router and major server) with American, European and other standards. (Ian MasonCegep de Jonquiere, 1994)

I would rather avoid discussion regarding platform wars, but this is an important consideration and deserves brief mention. As long as there are different types of people and different types of computers, we will have platform wars. Personally, I prefer the Macintosh. However, putting that aside, it might be worth considering several different types of computer labs, and there is no reason that all the adopted systems can not be integrated to meet the objectives of a single curriculum. If only one platform is selected, then it is absolutely essential that the adopted system is flexible enough to meet the needs of all those involved—both teachers and learners.

Decisions based upon a good pedagogical foundation

The introduction of new technology into the ESL classroom does not mean that the rules of the game are changed. What we, as ESL instructors do in a computerized classroom must be based on the same established and generally recognized principles of well-designed language instruction as prior to the implementation of the new technology. The following table outlines eight environmental conditions which we, as ESL instructors should be able to control in order to create the optimal learning environment for the language learner. I will discuss each item and what it means in terms of computer-enhanced language instruction.

Eight environmental conditions for optimal language learning : (Sivert & Egbert, 1994)

1)	Interaction	Negotiation/collaboration to establish meaning. Two way, social interaction.
2)	Authentic Audience	Interested audience to whom there is reason to speak.
3)	Authentic Task	Task is purposeful, transferable, interesting, varied. Use of learner content and grammar in context.
4)	Opportunities for exposure and production	Input that addresses different learning styles and preferences. A variety of modes: reading, writing, speaking, listening, drawing, etc.
5)	Help	Adequate time to complete task. Feedback, i.e., sufficient information to complete the task.
6)	Cognition	Guidance to encourage learners to pay attention and to act on opportunities presented. Overt teaching of language learning strategies.
7)	Atmosphere	Optimal stress, learners not afraid to participate. Feeling of comfort with others.
8)	Control	Internal/external

Interaction

First, what is interaction? Within the context of this paper, the term 'interaction' refers to a two-way, communicative process involving "negotiation and collaboration to establish meaning." The nuance here is quite different from the same word in the expression 'interactive software' often heard in computer jargon. The label 'interactive software' signifies that the person at the keyboard has a certain degree of control over the presentation (or manipulation) of the data contained within a so-called 'interactive' program. These 'interactive applications' do not necessarily provide an opportunity for a two-way, communicative process involving negotiation and collaboration between the person at the keyboard and the computer.

Computers can do many things well, but the one thing that computers can not do well is to respond in the same manner as a human being—the technology has simply not reached that stage. Computers can be programmed to give the illusion of human-like interaction, but that illusion breaks down rather quickly. Although there are some excellent so-called interactive games on the market (such as 'Spaceship Warlock'), if the person sitting at the keyboard can not come up with the appropriate response, s/he won't get very far. In this sense, interacting with a computer is still considerably different than interacting with a human being, and it is

doubtful that even a well-programmed computer package can act as a substitute for a human partner within the context of language instruction. It should be kept in mind that "computers are not intelligent, and, more importantly, have no world knowledge, from which any intelligent conversation would come." (James, 1994)

Another important point here is that interacting in the TL involves a number of different skills. Language learners must be able to pace a conversation, ask questions for clarification, rephrase their statements, and successfully cope with unfamilar vocabulary or expressions during a conversation. They must also be aware of body language, gestures, and facial expressions in order to properly interpet what the other person is actually saying, and to be able to detect whether the other person is telling the truth or lying. It is extremely doubtful that the computer can provide the language learner with this kind of interaction.

The question then is: "How can computers be used in the ESL classroom in such a way as to promote communicative interaction which will in turn directly contribute to the acquisition of new language?" Obviously, in order to provide the language learner with opportunities for communicative interaction involving negotiation and collaboration, the primary focus must continue to rest on teacher-student interaction, as well as student-student interaction. The role of the computer is secondary.

As previously mentioned, networked computers can allow students to interact with others in ways that were not possible before, and can provide opportunities for communicative interaction. As a communication device, teachers can instantly send a letter or some written message to each member of his/her class. Students can respond back individually to the teacher as part of one-to-one dialogues, or work in teams and collaborate their ideas and opinions before sending a response. As a presentation device involving a large screen at the front of the class, teachers can display text, pictures, photos, moving animation and animated graphics, video clips and sound all as part of a lecture with relative ease as part of a multimedia presentation. Again, the emphasis is on a teacher-controlled presentation of the target language where students have the opportunity to question, ask for clarification and negotiate with the teacher for meaning.

Another way to encourage communicative interaction involving negotiation and collaboration would be to have students use the computer as a tool for a particular task or project. For example, students are given an assignment to create their own multimedia presentations where students video tape each other giving short self-introductions in the target language. The students then morph or splice the video clips together, and place the entire video into a word-processing document or some other type of easy-to-use multimedia application. The final product would combine the video clips (with sound) and the written text (i.e.,

tapescripts of the students' self-introductions). In this scenario, students cooperate as they learn how to use the video and computer equipment, and they will be sharing ideas as each student prepares and prefects his/her self-introductions prior to taping.

Although little has been mentioned in this paper in regard to the phsyical setup of the CELI environment, it is important that the layout of the classroom itself should not block teacher-student interaction, or student-student interaction. In other words, the physical layout must lend itself to the classroom activities. If students are to work together, then the computer monitors might be recessed into the desktops allowing each student full view of the other students and the teacher(s). Computers and desks might also be set up in clusters (island arrangements) rather than in straight rows. Discussion areas (chairs placed around empty tables) might be set up away from the computers to facilitate group activities. Every aspect of the CELI environment has to be linked to the goals set in the curriculum and the choice of activities used in order to reach those goals.

Authentic Audience

The definition of an authentic audience here is "an interested audience to whom there is reason to speak." The previous discussion hinted that the computer in itself can not act as a substitute for a human partner in the context of language learning, and there is further doubt that the computer can serve as an authentic audience—computers are not intelligent, neither can a computer be described as an 'interested' audience. On the other hand, we can expect that many students will initially be caught up in the novelty of using computers for language learning, and will be bringing with them a certain amount of enthusiasm. However, this still does not address the issue of an authentic audience.

The traditional ESL classroom provides only two options to the language learner: 1) the individual language learner can interact with the teacher; or 2) the individual language learner can interact with other members of the class. Many teachers have large classes which rules out a sustained one-to-one interaction with any individual student, and there are inherent limitations within those activities where students work in pairs or in groups. By bringing computers into the classroom, we will be increasing the number of potential partners with whom the individual language learner can interact with, as well as to create situations where nearly every member of the class can keep active in some form of language study or practice.

The most apparent advantages of networked computers is that students can exchange information and communicate with others quickly and easily—in other words, networked computers provide students with the opportunity to communicate with a wider (authentic)

audience. Besides e-mail, discussion lists, electronic forums, etc., many netters commonly use the computer to chat or play 'multiple-user dungeon and dragon' games, and language learners can use networked computers in much the same way.

As a 'virtual' partner, what can the computer do? Consider how children often ask grownups to read to them. Sometimes, this is not because the individual child is so interested in the particular story, but rather the child wants to interact with the parent, aunt, uncle, or grandparent. In other words, the child wants to be involved with some interested partner. Depending on the availability of software, the language learner can, with the press of a button, have the computer read to him/her and be involved in some language learning activity. Many of the new multimedia packages on CD-ROM are as entertaining as having a real person sitting there reading a story. Also, if the student wants to hear the pronunciation of a certain word or phrase, computers equipped with text-to-speech software can read (voice) the selected text out loud to the language learner, and some of the PlainTalk voices available for the Macintosh are exceptionally good.

To sum up, the best 'authentic audience' is still going to be an interested human partner. The best way to provide an authentic audience is to have students engaged in on-line discussions using networked computers, or by having students work in groups and doing things with computers in situations where the computer acts as the impetus to get students talking (and keeps students talking) to each other and their teacher. The computer (as an authentic audience) substituting for a human partner is only desirable in those situations where a human partner is simply not available.

Authentic Task

An authentic task is "purposeful, transferable, interesting, and varied," and should provide language learners with the opportunity to use the TL in an authentic situation/simulation. The keywords here are "purposeful, transferable, interesting, and varied." First of all, typing is a basic skill as well as knowing how to use a computer. These two basic skills are transferable because they are of value in the real world. This is one reason why most students are interested in learning how to use computers, and serves to motivate students because of its very clear and recognizable value.

In the section on interaction, a student-created multimedia assignment was suggested as one way to encourage active, communicative interaction between students. This type of activity takes the students a step farther in acquiring transferable skills, because here students are using the same software normally used by professionals to create their own multimedia presentations. Such skills—editing video clips on computer, using software like

Adobe PhotoShop to achieve special affects—are definitely marketable (transferable) in the real world. In this scenario, students are using the target language in a realistic situation similar to designing an advertisement or commercial. If teachers wish to give the assignment an extra dimension of authenticity, the completed multimedia presentations could be displayed at a school festival or used in other ways, such as for promotion of the school or language program.

Again, our definition of CELI allows for this type of activity, because students will be talking about what they are doing in English, and the teacher will be providing instruction in English. (Ideally, the versions of software will also be English.)

Opportunities for exposure and production

Opportunities for exposure and production suggest that the presentation of the TL "addresses different learning styles and learner preferences." In a similar vein, language learners should have a number of options when it comes their turn to actively use the TL to respond and to express themselves.

It goes without saying that people are different and people like different things. Teachers have differing opinions regarding how to teach, teach in different kinds of situations, and often deal with a variety of students. Just as what works well for one teacher does not necessary work for another teacher. It can also be observed that some students find one particular activity enjoyable and stimulating while other students do not. The simple fact is that people like different things, whether one is talking about cars, computers, software, clothing, music, vacation options, or anything else for that matter.

Opportunities for exposure means that a number of different learning activities and varied presentations of the target language (possibly using different language models) will be available to the language learner. Here, in our discussion on computerized classrooms, this implies that the student will have access to a number of different software applications and multimedia products. This is why I believe that a multi-purpose, multi-functional computerized classroom is the best option. In other words, too great a focus on a singular approach is to be avoided. ESL instructors, and in this case, courseware designers must be sensitive to differing personal learning preferences held by students. All the components of the CELI environment (in terms of both hardware and software) must be flexible enough to adjust to the changing needs of both learners and instructors.

Opportunities for production means that learners have a choice of either sitting at the keyboard entering their responses into the computer, or interacting with the teacher and/or other students in paired and grouped activities. At the present time, computers can not

evaluate a language learner's oral producation in the TL. Computer analysis of learner's typed responses at the keyboard is also extremely limited. The individual learner can use drill and text-building applications (ESL software) for language practice, but beyond this a purely computer-based approach will not lend itself to generating student production in the TL. Just as it would be highly questionable (in the context of language instruction) to design an entire course syllabus based on a single type of classroom activity, I believe that it would be equally undesirable to set up a computer-based environment where the individual learner is expected to spend the large majority of his/her time interacting primarily with the computer, as in self-access or self-study situations.

Help—adequate time and sufficient knowledge

In order to facilitate the learning process, students must be provided with adequate time and sufficient knowledge in order that they can complete assigned tasks and/or activities within a given time frame. Teachers who provide their students with adequate preparation for assigned tasks and activities, create the conditions which work to insure the success of the students. This is important as it builds student confidence and helps to maintain student motivation.

When computers are introduced into the classroom, additional demands are placed on the students. Any teaching activity involving computers requires that students possess (or quickly attain) a certain level of computer literacy, and ideally, students should feel comfortable using computers. Unfortunately, many students have little or no computer skills.

We might ask here, "Why should we further complicate matters by bringing in new technologies that might or might not work?" The whole idea behind the introduction of computers into the ESL classroom is an effort to create the optimal environment for language acquisition and to maximize the efforts of the each individual learner. In the CELI environment, the main focus of the instruction is still on the TL first, and the computer second. The choice of platform, software, and related equipment which make up this environment should reflect this concern. Also, if students, teachers, and administrators are going to be convinced that computer-enhanced language instruction works, then the choice of platform (and soft) should encourage participation, rather than to be a source of frustration.

Although I would rather avoid making comments regarding which platform is the best choice, I will say that the Macintosh with its graphic user interface (and its many other user-friendly features) allows students with no experience to start feeling comfortable with a Mac program in a relatively short time. Although, the same might be said for some DOS

applications, all Macintosh applications have a 'consistent user interface.' This means that the pull-down menus are similar and most commands are the same for all applications. This aspect of the Macintosh helps beginners to get comfortable with using a variety of software, and in affect, speeds up the learning curve. The 'consistent user interface' of Macintosh computers also helps to cut down on the level of frustration commonly encountered when learning how to use new applications. We, as ESL instructors, do not want to have to spend too much time teaching students how to use the computer. Our focus must stay with language instruction first.

The deciding factor before picking hardware should be directly related to educational concerns—the goals set in the curriculum, and the availability of the software required to reach those goals. In other words, the curriculum is established along with a set of goals for the project. Then, a selection of software best suited to reach those goals should be determined. Finally, the hardware should be fit to the software. However, we must keep in mind throughout, that many of the students (as well as teachers) will little or no computer skills (as mentioned previously) and decisions made in regard to equipment and software should reflect that concern. (Sivert & Egbert, 1994)

Cognition

Cognition is defined here as: "guidance to encourage learners to pay attention and to act on opportunities presented; overt teaching of language strategies." But, what exactly are we talking about? What should learners pay attention to, and what opportunities are learners supposed to act upon? What language strategies should be taught? Some more fundamental questions might be: What is taught in the ESL classroom, and how is it taught?

The problem encountered here is that there can be no single definitive answer to any of the questions above. Every teacher has his/her own set of values and priorities, teaching philosophy, unique teaching situation, and would approach the job of imparting knowledge to his/her students differently. However, it should be safe to say that teachers want their students to think, and all teachers use different approaches and methods while trying to encourage their students to think. Teachers also have different opinions regarding this question of what should be taught in the ESL classroom. Some teachers strive to inform their students of alternative ways of thinking, cultural differences, and encourage students to be more aware of current events (e.g.., global issues), while other teachers place greater emphasis on developing specific language skills. In most situations, the individual teacher is free to conduct his/her class according to his/her own personal preferences.

This fact points out the need for a highly flexible environment in terms of both hardware

and software. Teachers involved in the CELI environment—including those teachers with little computer expertise—must be able to incorporate topics and the course content of their choice into the computer-based curriculum.

Ideally, the available ESL software must be " authorable" and that means that people with little computer expertise can customize or create new learning modules quickly and easily by adding to or changing the data content. WIDA Software, which is a clearing house for ESL software and products in Europe and North America, offers a number of authorable programs specifically designed with this in mind. The software packages listed below all have an authoring capability, and are available for both IBM (and IBM compatibles), and the Macintosh:

(product name)	(description)
Gapmaster	gapfill
Matchmaster	Matching pairs
Storyboard	Text reconstruction
Testmaster	Question and answer
Choicemaster	Multiple choice

Among these, one of the more popular WIDA programs is called 'Storyboard.' The teacher enters a piece of text, or story into the computer. That story is obliterated with each character in each word being replaced by an asterisk (*), leaving only the punctuation and

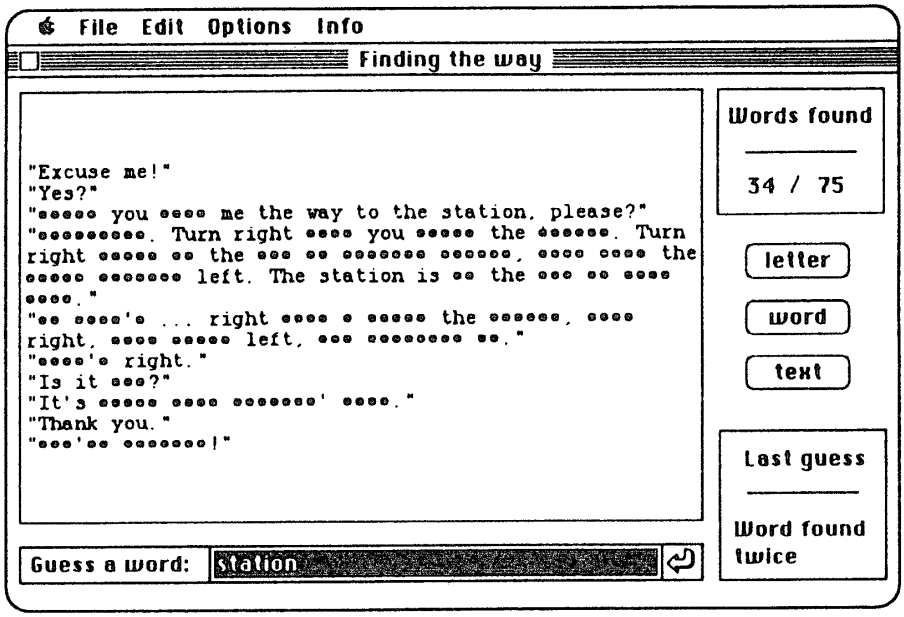

Figure 2. Storyboard

spacing. The task for the student (or students working in groups) is to restore the original text by guessing the words of the story, which then re-appear in their original location. Because 'Storyboard' has an authoring capability, any kind of text can be used including letters, poems, articles from newspapers and magazines, etc. This flexibility allows for different teachers to incorporate topics of their choice into the curriculum.

There are a number of different ways this same type of activity can be integrated into the class syllabus, for example: 1) students are shown a picture and then have to guess the story behind it; 2) students read an article and then reconstruct a summary on the screen; 3) students hear a dialogue or report, and try to reconstruct the text; 4) students reconstruct the original text by reading a translation; and 5) students write their own story, jokes, etc., to be solved by the other class members. (Borrowed from the April, 1994 WIDA catalog.)

Computer-assisted reading programs provide another excellent way for teachers to integrate topics of their choice into the computer-based curriculum. Most of these programs include HyperLinking (HyperText) capabilities—that is where the student can click on a 'hot word' in the text to display some form of help (definitions, examples, etc.)—and audio recordings of the text. Two highly recommended programs are: VersaText and HyperStory. The main benefits offered by VersaText is that:

1) It has an authoring component, so that ANY text can be turned into a reading lesson; and
2) It includes timed reading and paced reading exercises, two things that a computer CAN do better than alternative media. (Ross, 1994)

HyperStory (which costs $10) has been called an "absolutely terrific program." In brief:

> The students first read the text in paper, then open the text on the computer. Little light bulbs in the margins indicate places to open up a heuristic question. The student then also opens a notebook window and writes comments and answers. Towards the end of each story are several suggestions for writing on topics that by now should have been explored as the student has answered the embedded questions...the students feel the TEXT is talking to them, not the instructor. (Hanson-Smith, 1994)

Again, moving back to pedagogical concerns, the three ESL packages (Storyboard, VersaText, and HyperStory) mentioned above address many of same concerns as when conducting reading (text reconstruction) activities in the traditional classroom environment. These computer-based activities still allow for:

1) Teaching strategies for critical reading: guessing at vocabulary in context, questioning, summarizing previous points, making inferences, predicting

direction of argument or story, reacting in one's own words. (Students can do this with paper and pencil, but doing it instantly on the screen is an undeniable advantage.)

2) Encouraging discussion of readings: in a networked class students can share their comments on-line and engage in instant discussion in writing; if no network is available, they can print their comments to share in class or as memory primers for discussion.

3) Peer editing: student work can be shown on the screen and peers can comment, critique, edit, react, offer suggestions at different parts of the text.

4) Teacher feedback. (Rimblas, 1994)

Finally, I would like to emphasis the point that teachers with little computer expertise and with limited resources should still be able to put together small, low-tech activities for use in a computer-based environment. Most computer labs have word processing software, and many of these have macro abilities. Using these,

> ...one can easily write little macro programs that alter text in various ways —replace articles or prepositions with blanks, remove punctuation, change capitals to lower case letters, change correct uses of any of these or some other limited class of variable to in correct uses, highlight transition words, replace word parts (such as -ing/-ed, etc.) with *, or replace she with he, or one character's name with another—to name a few. An enormous supply of e-texts upon which to do all this manipulation is available through the net—the Alex gopher at Oxford for novels and other long, copyright free pieces, and the Electronic Newsstand at enews.com for current magazine pieces. (Williamson, 1994)

Atmosphere

Atmosphere has been defined as, " Optimal stress, learners not afraid to participate; feeling of comfort with others." This would be the same in the CELI environment as the traditional classroom. The only point I might add here is that students should not be afraid to play with the computer, and should feel comfortable with using the computer.

Control

In *Computer-Assisted Language Learning and Testing* there is a section which touches on external verses internal control. In brief, an "internally controlled situation is one in which

a person (the learner) believes the origin of control over the situation is within himself or herself, as opposed to a situation mediated externally..." (Robinson, 1991). What I will be talking about here has to do more with student control verses teacher control, or student control verses program control in the context of computer-enhanced language instruction. More specifically, this discussion will focus on the element of control within classroom activities.

To quickly define the use of the word 'control' in the context of classroom activities: highly-controlled activities are teacher-led substitution pattern drills, repeat-after-me warm-ups, listening exercises paced by the teacher operating a tape player at the front of the classroom, role plays where students memorize dialogue from their textbook, etc. In other words, highly-controlled activities are those involving strict teacher-guided (teacher/external control) language production with little learner autonomy. Semi-controlled activities are those which allow a small degree of learner autonomy, but the student is still expected to concentrate on specific patterns or expressions in the target language as dictated by the teacher. Less-structured activities are student-created role plays, student discussions with minimal teacher interaction and/or guidance—i.e those activities where the individual student has greater degree of autonomy (student/internal control) over the choice of language he/she wishes to use, and where the teacher is not putting words into the students' mouths.

It does appear that the majority of Japanese students seem to respond well to highly-controlled or highly-structured activities as opposed to the more open-ended ones. This same sentiment has been echoed by other members of the EFL teaching profession here in Japan. One possible explanation for this is that "the learning curve is very shallow because of the low English level, general reticence of the students, and minimal access to natural English." (Berberich, 1994)

Computer-based activities involving ESL software will generally belong to the more highly-structured, or highly-controlled category due to the nature of the computer itself. For example, the situation where there is one student on one computer using 'Storyboard' to reconstruct a body of text after either hearing it, or after reading a translation of the same text in his/her native language is a highly-controlled activity. The activity in itself dictates (for the most part) the language to be used by the student. However, by allowing the student to work with a partner (two students on one computer), the amount of control has been lessened somewhat because it is almost certain that the two students will begin to interact together (hopefully in the TL) using a wider range of structures and vocabulary than they would use if interacting individually only with the computer.

Again, most computer-based activities are so highly-controlled that it could be argued that they rarely resemble what normally goes on during communicative interaction between two human participants. Regardless of this, the WIDA programs are excellent, useful, and have remained popular for a number of years. These programs do have a place within the CELI environment. However, we need to ask ourselves if we want students to be continually involved in those activities which do not resemble human interaction but does closely resemble what students commonly encounter when taking exams—matching, multiple choice questions, true/false questions, fill-in-the-blank exercises. Should the entire course curriculum be based on this type of test-like language practice, which also happens to be the easiest to set up on the computer? Considering that in the Japanese educational system there seems to be too great an emphasis placed on rote memorization of English grammar and long lists of vocabulary items with little regard to helping learners develop a basic, functional fluency in the English language, this author does not believe that we need more of the same.

Some of the better options then for weaker students might be those highly-controlled, highly-structured activities yet allowing students a certain degree of autonomy at the same time—for example, using 'Storyboard' but allowing students to work in teams with the teacher encouraging students to converse with each other in English as they do the activity. For intermediate students, the 'multimedia presentation' activity described earlier in this paper would be good. For our better students, the activity allowing the greatest amount of student autonomy in terms of language production would be participation in student discussion lists either on the Internet or mini discussion groups set up within the local environment.

Another element of control concerns the choice of programs and applications we make available to our students. In comparison to the traditional classroom, the CELI environment has the potential to offer much more to the language learner in the way of learning tools ranging from multimedia CD-ROMs to simple interactive games. Each teacher has to decide whether his/her particular students are allowed the use of spell checkers, grammar checkers, on-line bilingual dictionaries, and other similar tools. However, all of these types of programs should be available to those teachers who wish to use them.

Conclusion

In this paper, I have presented a number of points: First, Internet access is vital as it literally opens up an entire world of opportunities to both teachers and students. Second, locally networked computers can also add a new dimension to the ESL classroom. Third, a highly-flexible platform is suggested in order to best serve the changing needs and requirements of a computer-based curriculum. Four, decisions related to curriculum and the

methods used to achieve the goals set in the curriculum should be based upon sound, well-established principles of ESL language instruction, followed by the selection of the computer technology (software, hardware, and platform) best suited to meet the goals set in the curriculum. Five, the adopted components must be adaptable, and "must be useful for more than one activity for more than one person." (Sivert & Egbert, 1994.) Finally, the technology should not dictate what learning takes place, but rather teachers should have full control over how the computer is used within the context of the classroom instruction.

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Abstract

Although computers have been used for educational purposes for more than a decade, the role of computer technology within the context of second/foreign language instruction is still in its beginnings. As many institutions rush to setup computer facilities for ESL instruction, it seems that unrealistic expectations and unfounded enthusiam have overshadowed careful analysis of how computer technology can best be implemented. I will argue that sound decisions regarding the successful implementation of computer technology in the context of second/foreign language instruction can only come from careful consideration of the generally accepted and well-established principles that support good ESL instruction. To begin this discussion, I will outline some of the many benefits associated with Internet access along with an introduction on the use of networked computers in the ESL classroom. In the second part of this paper, I will discuss eight conditions essential to the creation of the ideal learning environment involving computers.