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## **Instructionally-Mediated Technology: Implications for the Language Teaching Professional**

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### **20 Minutes Into the Future**

The year is 2005. It's 2:45 p.m. A high school ESL class is winding up and students are beginning to pack up to leave their classroom. Thong, age 16, disconnects his 8 1/2 x 11 " digital notebook from the plug on his desk. During today's 45 minute class this outlet has transferred image and sound files of all class activities to Thong's notebook. Thong places the notebook in his ergonomic pack and says goodbye to his classmates and teachers and leaves the classroom.

On the high speed rail that will transport him from his class in Albany, New York to his home on Lake Champlain in seventeen minutes, Tong takes advantage of the quiet and spends this time reviewing what occurred in his ESL class.

When his notebook pops open, his private tutor (a video image on the notebook's screen) greets him and asks how he liked today's class, what he learned and what kinds of questions he would like to ask. Thong indicates that he is interested in reviewing the U.S. courtroom simulation he and his classmates had undertaken that day. As a previewing strategy, he tests his retention of new vocabulary, structures and language functions with his on-line tutor. He then spends several minutes examining the interaction dynamics and accompanying discourse he and his classmates employed in their simulation. Using a combination of finger-controlled and voice-generation tools, he edits errors and enhances the dialog in the video. He then tackles tomorrow's assignment: recast the courtroom simulation by selecting new characters and a new problem and design the outcome. Using video and audio distortion tools, Thong builds his own courtroom simulation. He does this by using his imagination in conjunction with an extensive database of images and audio options. By the time he arrives at Lake Champlain, his version of the courtroom simulation is complete. At home he plugs his notebook into the notebook jack in the wall of his room and transmits the assignment to his ESL teacher's notebook for feedback. He then turns to his other high school coursework.

This glimpse of the not-too-distant future may inspire awe in 1995. However, it's clear that such technological power is just around the corner. What is less clear is how we can prepare teachers to make the kind of pedagogically grounded use of technology that is depicted here. This chapter explores the issue of teacher preparation in using instructional technologies. It defines the role of the teacher as a *mediator* of instruction with technology. What kinds of skills - perceptual, technical, and instructional - are important now, and are important for the near future are suggested.

### **Some History to Consider**

When thinking about instructional technologies, it is useful to consider their history. Instructional technologies have been in existence as long as the notion of teaching and learning. Chalkboards, manipulatives, and audiovisual aids have long been standard fare in classrooms. All sorts of hardware and software have been used to their maximum instructional potential and to less than their minimum. What is interesting is that to some extent the history behind the adoption of technologies has tended to influence how they get used. That us, in turn, can shape teaching and learning.

#### **1) The "Hand-me-down" Syndrome**

The technologies we use in education rarely originate there. We borrow them from other sectors. Technological innovation happens in contexts that have their own special driving forces: e.g., the government, the military, industry, and consumer markets. These are the sectors from which technologies used in education originate. For example, in recent times the home entertainment industry has supplied education with a great deal of technology: the VCR, the videodisc player, the CD-ROM, the video camera. All of these technologies have become accessible, inexpensive, and extremely easy to use, not in consideration of the needs, goals, and beliefs about what constitutes good instruction, but because there is a vast consumer market.

This hand-me-down syndrome can be considered both a positive and negative force in how technologies get used in schools and how they come to influence instruction. The positive side is that we *get stuff*. That is, we reap benefits from others' research and development dollars. The negatives are that 1) instructional beliefs, goals, and practices have to get laid down on top of technologies that are designed for something other than teaching and learning; 2) there is a risk that the technology shapes what we do; and 3) good pedagogical uses take a long time to evolve, when they do.

## 2) The "Because We Can" Syndrome

Neither the printing press nor the photocopier machine was invented to be used in schools. Yet teachers were quick to appropriate these technologies. The lasting impact they have had on instructional practice cannot be disputed. You only have to walk into any language classroom in the country to witness the photocopied handout phenomenon. Like any technology, handouts can be overused, used poorly, or used to maximum pedagogical benefit. What is clear is that, when handouts get misused, instruction is getting shaped by the technology, not the other way around.

A more contemporary example comes from a developing country, although such a thing could happen anywhere. Told that the audiocassette player was an essential tool in language teaching, a well-meaning instructor recorded and then played back for his students a story using his own voice.

Not to belabor the "because we can" issue, I'll offer just one additional example, one that might hit closer to home for the TESOL professional. It wasn't that long ago that video playback got used as it was designed to be used in consumer contexts; that is, for passive, entertainment-oriented viewing. Teachers consequently had students watch videotapes *because they could*, not necessarily because of a solid pedagogical rationale. One need only look at the work of the TESOL Video SIG to see how far we've come in doing the needed conceptual work and in turn developing pedagogically-grounded uses for this hand-me-down technology.

We can learn from history that there are reasons technologies get used well and poorly. The bottom line seems to be that some conceptual work needs to be done to retrofit the technology to practice if it is to be used well. Because-we-can is not good enough. Let's go back to the **20 Minutes Into the Future** scenario to examine the nature of this conceptual work.

### **Technology-Mediated Instruction**

The learning and teaching that went on in the ESL scenario above is not that much different from scenarios in ESL classrooms today. The emphasis was on communication and the bulk of learning was socially mediated. Student interaction was treated as integral to learning. In this futuristic scene, the teacher planned, orchestrated, and facilitated the kind of communicative activities that strike the right chord in our 1990's TESOL hearts. Students engaged in constructive discourse. The teacher supported it.

What role did technologies play in this scenario? Certainly not a large, looming one. The technology was instead very quiet and very powerful, used much like

technologies as they are used well now. The hardware is secondary and subservient to the larger goals and social processes of learning. The video storage, playback, and manipulation technologies were pulled into the service of a real-time communicative activity: the courtroom simulation. Students perhaps also made use of technology in collaboratively researching, preparing for, and rehearsing the simulation. Both students and their teacher got a record of what was central to their learning and became empowered by tools to make greater sense of the language and nuance contained within that record. Teaching and learning continued in this vein when the student left the classroom.

What is particularly salient about this scenario, is that learning processes are human-, not technology- driven. Students are involved in their learning through negotiating meaning with one another, not with technology. The teacher is involved in facilitating these processes, not in cumbersome manipulation of hardware. The technology is serving her need to document learning processes, provide individual support and feedback, and engage students in related learning activity once outside the classroom. Technology is serving as a tool to complement and enhance these everyday processes.

You may be asking yourself, "That may be all very well and good, but video is easy. What about those computers?"

### **The Problem of Agency or "Whose in Charge Here?"**

Whether its through the language we use to talk about computers, or the kinds of software we build that try to emulate thinking behavior, the fact of the matter is, we tend to perceive this machine as being able to act on its own. We tend to think of a computer as having powers independent of its user; that is, we attribute agency to a box of plastic parts. We've all been guilty of resorting to "The *machine* did it!" when something goes wrong, and even as far as "The machine doesn't *like* me!" when things go *really* wrong. Much of the reason behind this tendency to anthropomorphize the machine is due to bad interfaces: interfaces that cause the user to feel disoriented and not in control (Laurel, 1991). In this respect, computers represent unique and sometimes difficult challenges when it comes to conceptualizing their role in instruction.

The problem with this perceptual frame is that it can be very limiting, especially for teachers who are new to computers. First, there is the fear that the machine will do something unpredictable. This can result in two additional fears: 1) that the user will become forever "lost" and at the mercy of something she doesn't understand; and 2) that she'll look foolish in front of peers or students.

The fact is, computers are fundamentally dumb and, when compared to human intelligence, will most likely remain that way (Dreyfus & Dreyfus, 1986). The video tutor on Thong's notebook screen gave cues and canned suggestions to guide Thong. The tutor's main function was that of a recordkeeper that could pick from a closed list of possible suggestions it could provide Thong. Selection from this list was a matter of smoke and mirrors: this tutor could not perform its function if Thong and Thong's teacher had not input specific information and directed it to respond.

Another risk comes wrapped up in the agency phallacy. When too much power or agency is attributed to the computer, it risks being used as an *electronic babysitter* (Branscum, 1992). The thinking goes something like this: Computers are supposed to be able to teach, so let the computer teach Jorge. Jorge is consequently sent off to the computer so it can teach him something. In this way, neither the teacher's time nor the student's is ostensibly wasted. However, the idea of computers freeing up the teacher has a double edge: true, computers can free the teacher from center stage and allow students some control over their learning, but computers can also get used as a way to feel absolved of responsibility for the challenges some students represent. This is particularly true for language minority students in mainstream classrooms.

Traditional cudors for computer assisted instruction include the message that individualized instruction has merit, and so it does. However, this is only true when that activity is valued by and

integrated into the larger community and learning context (Meskill & Shea, 1994). In other words, what an individual student does with the machine needs to be perceived by all involved as a piece that fits into the big curricular and social picture.

Machines need to be cast in the role of mediators of learning, not sources. Subtle messages come through software sales techniques that portray computers as teaching machines that offer *solutions to problems*. This conception of the role of computers in instruction, in combination with the notion of agency in the machine itself are issues that are both prevalent and problematic.

Conceptual work that needs to get done with computers in ESL instruction can begin with taming the beast. Teachers need to understand that the machine is stupid and without them are little more than a home entertainment system (used to reward, punish and/or babysit). They need not be made to feel like unskilled, non-knowers of special formulae or tricks. Rather, they need to feel empowered by the fact that, given the goals and processes of language teaching and learning, without mediation by smart teachers, the machine's role is quite limited. Fortunately new and better interfaces and technical support (see Note to Administrators) will eventually help render the soul in the machine the pile of silicon it truly is in the minds of teaching professionals. The teacher in our futuristic scenario had no wires, no code, no mystery buttons to push to make this class happen. The interface she used on her notebook could be used by anyone. Happily, it is in fact the goal of the better, more thoughtful software producers, to eliminate any sense of powerlessness and promote a sense of what Winograd and Flores call "at handedness" in user interface design. Computer interfaces will eventually become so "at hand" that their use will become as second nature to the user as switching on a light or using a hammer (Winograd & Flores, 1988).

The second bit of conceptual work is also related to the notion of agency. Historically, instructional technologies have been designed and used based on the transmission model of education. This older model sees the learner in a passive/receptive mode and any learning that takes place the direct effect of teaching. The transmission model sees the teacher possessing and purveying knowledge. Much of the media used in instruction -- filmstrips, audiocassettes, computers -- have likewise been conceived as conveyances of knowledge (Figure 1). This conception of technology's role naturally casts the learner in a receiver mode. One need only look at the vast number of comparison studies with media -- studies that use a classic control group and treatment group (with media) research design -- to note this prevalent conceptual framework. This line of thinking sees learning as the direct result of the medium's actions. Any involvement on the part of the learner is not taken into account. This concept -- that learning is caused by a machine -- needs modification if instructional technology is to fit the needs, goals, and beliefs of contemporary language teaching.

- pic of transmission model - Figure 1

The fundamental weakness of the transmission model is that it is based on older notions of teaching and learning. Constructivist, and in the realm of language teaching, Communicative schools of thought have since brought a shift away from thinking of the teacher as knower toward the notion of learning as social and collaborative. The basic concept of the role of instructional technology, however, has been slower to evolve in a like direction. There persists a sense that technology, especially computers, exert some power and effect some learning independent of other processes and concerns. Probably the first credo for teachers learning about computers, then, is: *Teachers teach. Machines don't.*

- pic of mediated learning -

Machines are tools for learning, not agents of it. In a Communicative framework they are at their best when supporting social/collaborative processes. In other words, they can be used as catalysts and tools for thinking and communicating. Their use can be integral to learning activities, but not their source.

So, how can teachers go about evolving pedagogically-driven uses for technology in their classrooms? In thinking about computers and their potential role in classroom contexts, it is useful to begin with what you already know about multimedia,\* which is quite a bit.

### **-Multimedia Literacy**

For teachers, adapting computers can represent a cultural transition as well as a methodological one ( Poole, 1995). Fortunately, understanding multimedia and its potentialities for ESL does not represent a cultural transition, it more closely represents a cultural expansion. First of all, whether we like it or not we are all very media literate. We have lived on a rich, steady diet of popular media from birth. That means we are all, regardless of nationality, socioeconomic status, or cognitive ability, media literate. We know how to watch TV and films. We know how to listen to the radio. We understand well, but mostly unconsciously, the intricate conventions the media use to inform and entertain.

Multimedia literacy is defined by what we already know about media elements and how these can interact to affect language learning. We know, for example, the power of visuals in teaching and learning. We use visuals - both still and moving - frequently in language classrooms. Charts, diagrams, photographs, slides, and video are tools that achieve many purposes. Some of those purposes are: activating schema, providing context within which meaning can be more effectively portrayed and analyzed, stimulating associations, encouraging connections between what is already known and what is new, provoking discussion, illustrating, defining, motivating, clarifying, and the like.

We also understand the many roles that audio can play, be it audiotape or audio with video accompaniment. Audio and videotape bring the target of language study into an accessible and controllable format. It can be the direct object of practice, and/or can be used much as visuals are used to stimulate, illustrate, and the like.

What we know about visual and audio is that they can be used in numerous ways and in many combinations as tools for instruction. Combine our extant familiarity with these elements with how we use text in teaching and learning, and you have the basics of multimedia literacy.

We need now only to add in the element of control and manipulation of these elements that is now and is becoming ever more feasible with multimedia technologies. What does this control gain us as educators? Let's again return to the 2005 scenario. This classroom is wired to and managed by a central processing system. This system is essentially built to assist in the management of instructional processes. The process of gathering, storing, sharing and managing background information for the courtroom simulation was facilitated by the system as was documentation of the activity itself. In preparation for the group activity, the instructor most likely tapped into the system to call up visual aids -- maybe clips of actual court cases, perhaps audio/visual samples of the kinds of language students may want to use in their simulation. This kind of activity was in no way technology dependent. On the contrary, it was called into the service of instruction by virtue of 1) its visual, auditory and textual elements; and 2) streamlined access to and control over that information.

What about the out-of-class work Thong undertook with his notebook? Here the power of controlling and manipulating information -- the true hallmark of computers -- is exemplified. What is important to note, however, is that the material being controlled and manipulated by Thong originated in the social context of his classroom. As such, it is properly valued and integrated into the larger instructional process.

These are critical aspects of instructional technology now. When examining hardware and software for potential use in the classroom, teachers can begin by asking if 1) the media elements - aural, visual and textual -- are being used in ways they deem effective; 2) the kind of

manipulation and control of material is translatable to existing classroom contexts; 3) adjustments might need to be made to the existing classroom context; and 4) it's worth it to exploit the attributes of the technology.

### **-Where to Begin?**

Reading the other chapters in this collection is a good start. Examining exemplary uses of computers and considering if and how they might be adapted to your own situation serves many purposes. It provides a tangible experience, lets you learn from others mistakes and successes. Practitioners can learn a lot by studying model uses and thinking carefully about why they are effective.

A teachers can also start with what she already knows:

- the needs, goals and constraints of her teaching context
- how to learn with and from her students and colleagues
- the roles visual, aural and textual elements can play in the instructional process

and believes:

- machines are servants to her needs and the needs of her students
- machines don't teach, teachers teach
- machines well integrated into classrooms can support and enhance instructional processes

Is the quality of technology mediated instruction software dependent? If you look at the research of recent years and talk to long-term computing teachers, the answer is a resounding "NO". Even the most mediocre of software can induce rich constructivist learning.

The process of considering adoption of instructional technologies should be reflective of good teaching practice. That is, in many ways it should mirror the kinds of thinking and discourse we orchestrate for our ESL students. Teachers need to talk to one another to share their thoughts and experiences with various media. It is, after all, the negotiation of meaning that instantiates our thoughts and beliefs. Teachers talking about instruction with, through, and around computers is unique to the technology. Computers tend to prompt discussions about the the possibilities (and limitations) for mediating instruction with the machine. They are discussions with the machine metaphorically in the center. This is a place where meaning gets made; a process through which understandings get constructed; a dialogic space where craft gets further crafted.

### **Conclusion**

Cast in a role subservient to Communicative Language Teaching practices, technologies such as those in the 2005 scenario break away from the transmission model of learning and teaching. But, there seems to be a strong impetus to do something *now*. There is a great deal of both risk and promise in doing so.

Looking ahead at the ESL classroom in 2005, we can see how the craft of teaching learning will be supported by technology, as long as we remember who we are.

\*Here the term multimedia refers to visuals, audio, and text orchestrated by a computer.

## **A Note to Administrators**

Training and adoption require a great deal of rethinking the curriculum and the act of teaching - this thinking takes time beyond learning which button to push.

Keeping abreast of all that's available is a daunting task. Help your teachers be informed.

Encourage teachers to resist the the because-we-can and the everybody-else-is syndromes.

Be aware that what vendors are selling you are handmedowns from other sectors and as such need to be retrofitted by laying down good practice on top of them. This takes time.

Resist the temptation to buy. Let your teachers select what they need. Give them total support in discovering what works best for them.

Don't let buttons and cables get in the way of teaching and learning. A building technical support staff is a terrific investment.

Promote the attitude that technology represents opportunity, not imposition.

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