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Teachers' Uses of Electronic Texts
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In my talk today I'd like to share with you the research we've been undertaking over the past year. As part of a 5-year research project, we are examining the ways in which teachers of English as a Second Language (ESL) are using electronic texts to teach language and literacy in the U.S. public schools. I think you'll find that the ways in which technologies are being used and the kinds of questions this kind of use generates both fascinating and very pertinent to issues of language, literacy, and technology in general, and second and foreign language instruction in particular.

First, I'd like to tell you that I've been in the CALL business for a long, long time. So long in fact that there was a time, still very fresh in my memory, of working with teachers who truly believed that if they closed their eyes real tight, computers would just go away. They wanted to wish away something that they perceived as cumbersome, time consuming, and, most importantly, threatening. This was, of course, during the era of ugly, unintuitive, and unpredictable mainframe and microcomputer interfaces that struck terror in the hearts of most of the population, not just teachers. But, even back in what we now view as "the dark ages" of computers - the days of DOS, BASIC, and interminable saves to 5 1/4" floppy diskettes - there was those gutsy teachers who toiled away to make use of these machines as tools to support the language and literacy development of their students. Such teachers were rare, but there.

Nowadays, as you know, ease of use has increased exponentially to the point where if you can point and click, you can access the world. We are seeing, therefore, teachers who are no longer feel threatened and bogged down by technological and ergonomic constraints. Instead, they are free to consider first and foremost the pedagogical - what makes the most sense for their students' language and literacy needs. In most cases in the late 90s teachers are no longer squeezing their eyes shut and trying to wish away machines.

Let me begin by giving you a sense of ESL teaching in the United States - the focus of this research. The number of school-age children for whom English is not the native language is rapidly increasing. Children of all ages and levels of ability from all corners of the globe are attending U.S. schools. They are in need of English language and literacy assistance. Although our research thus far has been concentrated on what is happening in New York State schools, the size and diversity of New York - we are the third largest in the United States in numbers of non-native speakers of English - makes it representative of a myriad of ESL contexts around the nation. Much of New York State's ESL population is concentrated in New York City where many bilingual programs - programs that offer instruction in both English and the child's native language - are offered in addition to ESL instructional support. Also, our many mid-size cities, including Albany, and their more rural environs are serving growing numbers of non-native speakers. The most common form of this service is through ESL "pull-out" and "push-in". Pull-out involves children being taken out of the regular classroom and provided either individual or small-group ESL instruction. Push-in involves children being accompanied by an ESL specialist in the regular classroom where support is provided "on demand" during regular mainstream activities. These are the basic forms of ESL services, though we have been finding through our visits and interviews, that there is much variation in how these are provided. The overarching goal of all of these ESL support services is to aid children in attaining the language and literacy competence that will enable them to move fluidly between academic discourses. The overarching question for our project is how electronic texts are playing a role in attaining that goal.

Let me also explain our use of the term "electronic texts". We're defining electronic texts as any electronically displayed information: the written word, pictures, audio, video in any and all combinations. We've spent some time reviewing current thinking concerning the differences between what has historically served as the basic tool of literacy - the print medium - and electronic texts from a variety of disciplines. And we've begun to conceptualize what we think may be important distinctions when it comes to second language and literacy development. Here are some of the differences we feel may carry implications for the ways second language learners interacting with the stuff of their language and literacy development

| PRINT | E-TEXTS |
|------------------------------|----------------------|
| linear | non-linear |
| self-contained | hyper, decentralized |
| hierarchical | anarchic |
| static | dynamic, malleable |
| whole | fragmentary |
| restrictive | democratizing |
| private activity | public activity |
| illustrations | mixed media |
| culture-bound understandings | local understandings |

These are our fledgling understandings about print/e-text differences. Our long-term objective is to examine these unique features of e-texts as ESL children interact with them and, of course, this initial list is subject to modification the more we observe what children actually do online.

This is our initial list. What surprised us is that when we asked the children, who are always much wiser and more down to earth than we are on such issues, when we asked the children what the difference was between interacting with what was on the computer screen and what was printed on paper, they very wisely informed us that the reading the computer screen was healthier for their necks - looking straight ahead at the screen avoided the stiff necks they got holding and looking down at print material. They also informed us that when they read on the computer, they don't risk getting paper cuts.

As part of our work at the National Research Center on English Learning and Achievement (CELA), we set out to first address a simple question: In what ways are ESL specialists making use of electronic texts? To this end we surveyed all buildings - about 1200 - in the state asking teachers a number of questions about their use of technology with their ESL students. When asked what software packages they were using with their students, we were surprised by the response.

A surprisingly large majority of software packages reported being used with learners of ESL are designed for native-speakers of English (95.1% of the raw count of the total number of software products mentioned). Of these, there is a close to even split between what we classify as tools (e.g., word processing, reference tools, presentation software) and content-specific software designed to be used with native speakers of English, not students of ESL.

The fact that only 4.9% of software products reported are those specifically designed for learners of English as a Second Language is remarkable. Why? I'm sure this audience is aware of the large number of ESL/EFL products now available. Not only that, but publishers, at least in the U.S. are using fairly aggressive marketing strategies to sell them. This non-use of ESL-specific products is also curious in light of the "problem-solution" stance typical of many of our school districts when it comes to ESL learners. One would assume that ESL software products which publishers tout as high-tech "solutions" would peel to schools. The fact that teachers in New York State are not using of CALL products also contrasts sharply with the heavy emphasis in our research community on researching applications specially designed for the non-native speaker.

This fact is not surprising due to the extensive power and mileage one gets out of computer tools versus instructional applications. Nor is it surprising in terms of the content-richness of products designed for native speakers. It is also not surprising in that ESL teachers in the U.S. are given free reign in terms of how they support their students' immediate needs - their work is not subject to a standardized curriculum. They therefore enjoy the opportunity to apply ingenuity and resourcefulness in their craft.

Those ESL-specific products that survey respondents did report using can be characterized as incorporating and focusing on visual components as aids to vocabulary acquisition. The four most popular packages, for example, provide language-specific practice through students seeing a picture representing a word or sentence, reading text that accompanies it, and hearing the word or sentence spoken. Students essentially match the three elements (visual, aural, textual) in various ways in various formats. It's interesting to note that this combining of media - the written word, audio, and video - for vocabulary work is perceived by the teachers we've spoken to as the most valuable activity offered by this kind of product.

Now let's turn to the native-speaker software products reported. As you can see, computer tools are the most widely used with ESL learners by responding teachers. Writing tools - which include word processors, desktop publishing and story-building software - are clearly the most popular. Of course this writing/publishing trend reflects software usage in schools overall where composing and creating documents is increasingly undertaken on computers. Software tools for presenting projects and reports comprise the second category of most commonly used products in this category followed by reference software: encyclopedias and other information databases.

Note that a great deal of native-speaker software for the content areas is being appropriated by ESL professionals for use with their students (43.2%). Such native-speaker products tend to be rich in content and motivate use of realistic problem-solving strategies and accompanying discourse. These are products such as *Where in the World is Carmen Sandiego?*, *The Oregon Trail*, *The Sandiego Zoo* series, the *SIM Series*, *SimEarth* and the like, and the *Sticky Bear* series for the younger grades. Their designs, unlike ESL-specific products, are not preoccupied with form and discrete language learning objectives. They are, on the contrary, designed for learners to be doing and thinking about relevant content using English. Such products emphasize real tasks that require language use rather than automatic or metalinguistic knowledge that tend to be the focus of most software designed for the non-native speaker. In short, there seems to be a wide preference for such products. Our next task was to attempt to determine how these were being used and to what effect.

As follow-up to our survey, a number of self-identified technology-using ESL professionals were contacted and interviewed by telephone. Additionally, we have been observing and videotaping ESL and electronic texts classrooms in five districts in Upstate New York were observed and videotaped. First, let me share some of our findings from the telephone interviews.

We first asked teachers what they liked/disliked about software they had or were using. Those who had experimented with drill and practice software - packages designed both for native and non-native speakers - responded that they found some things useful: 1) the fact students could practice independently; 2) the fact that students had some control over the pace and direction of their learning; 3) the fact that correct answers were available to students to check how they were doing; and 4) the fact that many packages offered record keeping whereby both the student and teacher could gain a sense of the learner's progress and problem areas. Their complaints about this genre of activity mostly centered on student motivation. They uniformly stated that after the first ten to fifteen minutes of this kind of activity, students lost interest and had to be coerced into using the software again. Many stated that after some initial enthusiasm, these packages are now collecting dust on the shelf.

Teachers who used native speaker tools and content packages (the majority) identified the problem solving and critical thinking aspects of this activity as being very valuable and motivating. The independent and joint decision-making these packages require and their immediate consequences were cited as highly desirable. Of course the fact that these content-focused packages supported the kinds of language and

literacy skills ESL learners need to participate in the academic programs is a big plus. They also reported that they selected to use these packages because there was typically a purpose, end, or outcome - a solved problem, a product of some kind - that could be brought back, shared, and made relevant to the broader learning context.

When we asked how they were using the packages, again mostly tools and content area software, they emphasized that because ESL is not a separate subject in the curriculum but a space where the content of social studies, science, and math can be made more accessible, content-area packages were a natural.

These teachers see technology as a means of enabling the students to construct situations and obtain information which can be brought back to the whole class and which can serve as stimuli for rich language use activities.

From the teachers interviewed, the following kinds of computer use were identified:

* Emergent literacy (K - early elementary)

Alphabet and spelling programs are used in developing basic literacy skills. Additionally, graphics programs are used to support learners in making connections between images and text. Graphics often serve as a springboard for discussion and writing in the target language.

* Literacy through stories (elementary)

Teachers use programs that allow students to choose environments and graphics to support the stories they write. There is preference for software that allows students to write, voice record their stories, and listen to the playback as they follow the text on the screen. Some use of book-length reading programs was also reported. Here, while reading the story, learners can access explanations and animations through hypertext links.

* Literacy through personal journal writing (elementary-middle)

Word processing is used as the medium for interactive dialog journals. Entries are submitted to the teacher on diskette on which the teacher also saves her personal responses to students' writing.

* Literacy through content (upper elementary - middle)

Social Studies, Science, and Math programs are used by ESL teachers as part of interdisciplinary, theme-based activities. Multimedia encyclopedias are also used for content research.

* Literacy through publishing (upper elementary - middle)

Word processors and desktop publishing packages are used to create booklets and newsletters. Multimedia presentation tools are also used by students to create slide shows and photo displays.

* Literacy through problem solving (upper elementary - middle - high)

Interactive games and simulations are used in conjunction with content-based work. In such programs students make thoughtful choices based on their understanding of text and visuals materials for which there are immediate consequences.

* Literacy through telecommunications (middle-high)

E-mail is used to connect students to other schools, to experts, and to shared problem-solving hubs. There is also a growing use of the Internet for accessing information relevant to students' native language and culture, to the interests of individual students, and to support mainstream classroom work.

Productivity tools and content-rich software is preferred by the vast majority of teachers. They feel it helps learners develop literacy skills that are embedded in the contexts of the whole curriculum. They use programs that bring the social studies, language arts topics, science, and math into the ESL classroom and which encourage students to create content-appropriate language.

In a situation where language limitations exclude them from many academic activities - e.g., most academic activities for quite a while - computers are something ESL learners can do. ESL learners, in other words, are greatly empowered by the opportunity to create and manipulate electronic texts. I'll speak more to this notion of empowerment shortly. In terms of perceived outcomes, teachers report their learners to be highly motivated by electronic texts and they are, consequently, learning very quickly. Marcella, who you will see creating a bilingual dictionary, had been in the U.S. only two months when she was able to shape a reference document for herself about which, you will see, she is very, very proud.

The kinds of uses teachers are reporting and their pedagogical rationale for making use of products in the ways that they do generate many interesting questions concerning the interaction of second language and literacy development with these electronic texts.

Our current question is: What unique features of electronic texts are supporting second language and literacy development? To address this question we have been working closely with five school districts in Upstate New York to develop methods of understanding the ESL/E-text interface. We've spent a great deal of time watching children and their teachers using e-texts and talking to them about what they do. I'd like you to meet some of the international children who are interacting with native-speaker electronic texts to develop their English language and literacy development. These particular children study in a rural district in northern New York state. During their ESL pull-out time, they work on their English language and literacy skills using the computer as a tool.

[video, 4 minutes]

The ESL teachers in this school district have some interesting things to report concerning their students' involvement with technology. First, their ESL students learn English very quickly. The district attributes this, in part, to the fact that they are, from the time they enter school, actively engaged in using English in meaningful and productive ways; a great deal of this happening in consort with electronic texts. Secondly, they report that the ESL children receive a great deal of recognition from their native-speaker classmates for their skills and facility with computers. They are, in other words, envied by their peers. Rather than ESL being viewed as in some way 'remedial', then, ESL is viewed by the school community as a special, almost privileged place where children become skilled at technology. As you can see from their faces, they are extremely proud of the work they do. We are seeing this in all of the schools we have been working with thus far. We're seeing children reading, writing, speaking, and listening in English while undertaking meaningful, content-related tasks with electronic texts. Through publishing projects we're seeing ESL children reaching out and informing their communities of the special backgrounds, skills, and qualities they bring to their schools and communities. We're seeing ESL children become knowers and teachers who help others learn to use various the various technologies they've come to master thereby experiencing additional opportunities to use English in highly meaningful and productive ways.

In the next years of this work will examine the interaction of the second language learner's special qualities, experiences, and predispositions with the unique qualities of electronic text environments; especially the features of publicness, collaboration, and prestige that we are seeing as particularly salient in the schools with whom we have been working. We are also taking up the issue of cognitive flexibility as an attribute of the emerging bilingual/biliterate as this interacts with the unique features of e-text and the e-texting ecologies we are observing.

Some Closing Thoughts

Current thinking in the field of second language and literacy acquisition would ideally see interaction with electronic texts as task-based and socio-collaboratively oriented in lieu of seeing students drilled in isolation from the rich context of school life. These software usage findings and reports from the field suggest that, in the case of self-identifying practitioners of technologies with ESL students, quite a bit of usage is in keeping with contemporary beliefs and practice in second language learning. These language professionals are, in many instances, using technologies as tools through which and around which language

and literacy skills are socially and collaboratively built. Teachers appear to be tailoring tasks and guidance for their students around electronic texts and tools, emphasizing meaningful interpretation and production of target content, in English and the native language.

These trends in software selection and use also suggest that most reporting teachers perceive the computer less as a delivery system and more as a tool with which and through which language skills can be developed in task/process-oriented frameworks. It may also be that teachers who use these products with their ESL students are just plain resourceful teachers - making use of what is authentic and available. These trends may also be reflecting a sensitivity to the importance of content richness and correspondence with content-area linguistic and conceptual needs of ESL children in U.S. schools.

For two decades now, the education sector has appropriated computer technology to serve teaching and learning across the disciplines. And, as advances in technology have developed, so has the rationale for incorporating this medium into daily instructional streams matured. For example, in the earliest days of computers in education, machines were viewed as instructional delivery systems whereby a given body of knowledge could be transmitted to students by virtue of its being on a screen and allowing some rudimentary forms of "interaction". Computers were generally conceived as teaching machines that would take on responsibility for training particular skills and content thoroughly and uniformly. They represented, after all, instantiations of "high technology"; a concept still at the core of our understanding of the relationship between humans and machines.

More recently, however, the computer is being viewed more as an integral part of socio-collaborative learning activity and less as a means by which knowledge and skills are transferred to learners. One discipline in which these shifts in perception concerning the role of computers in the teaching and learning process have been particularly distinct is in the field of language learning. Once considered an ideally "patient partner" with which learners of another language could endlessly drill and practice until mastery occurred, the computer is now more widely viewed as a tool through and around which socio-collaborative language learning can take place. This shift in thinking directly parallels shifts in our understandings about the best route to learning language in general, and empowering linguistic minorities in particular.

Theory and practice in second language learning has moved from treating the enterprise as one of mimicry and memorization to one that is a complex, multidimensional process influenced more by the interaction of the individual and the contexts of acquisition than by notions of standardized, overt forms of cognition. It has moved away from viewing language as a static set of automated processes towards one that accounts for the multiple, complex aspects of language as a central feature of human identity. Language teaching practice has consequently moved away from emphasizing the learning of discrete linguistic items to activity that orchestrates full experiences of, and involvement in, language as it manifests itself in reality; that is, as a means of making and understanding meaning.

Like all innovation, however, developing notions of teaching and learning, with and without technology, take time to influence educators and become established in practice. In the area of second and foreign language learning, this is very much the case. New understandings of how language is best learned and acquired have been slow to influence classroom practice. In terms of computers, there is risk in bringing technology to language learning contexts where these beliefs persist. As is evident in these initial findings - where we see teachers approaching technology with their eyes wide open, free to think pedagogically - I am heartened at the tremendous promise of change.

Please visit our websites:

<http://www.albany.edu/CELA>
(National Research Center on English Learning and Achievement)

<http://www.albany.edu/CELLAR>

(Center for Electronic Language Learning and Research)