Developing English Language Curriculum for Online Delivery

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ABSTRACT
The E-Language Learning (ELL) project is an ongoing collaborative effort between the US Department of Education and the Chinese (PRC) Ministry of Education. Its purpose is to develop a free, online language-learning opportunity for students in the two countries. Developers in the US are now in the process of creating a program to teach English to the Chinese, while the Chinese are simultaneously developing a program to teach Chinese to English speakers. The authors, who served as the English language development team for the US in the initial stage, describe the curriculum development process for the program, addressing issues in meeting the challenges of developing oral/aural proficiency in language using an online platform. These include making limited use of voice recognition technology for assessment, integrating cultural elements for the targeted audience, developing a program with optimal learning potential, and making the best possible use of technology that is both technically and financially feasible. The authors also include descriptions of clarifying learning goals and curriculum and providing means to track both in order to provide direction for program development, making careful research-based decisions to inform development, and providing careful and ongoing collaboration between technicians, content developers, and language educators.

KEYWORDS
English Language Learning, Online Learning, Oral Proficiency, Language Curriculum, Chinese

INTRODUCTION
The E-Language Learning (ELL) project is an ongoing collaborative effort between the US Department of Education (USDOE) and the Chinese (PRC) Ministry of Education. Its purpose is to develop a free, online language learning opportunity for students in the two countries. The project was first introduced by President George W. Bush in 2001 during a meeting with Chinese officials in Shanghai. The USDOE then convened a panel of experts to explore the possibility of creating a web-based language education program. This advisory group met with its Chinese counterparts in both the US and China to advance the development of the
ELL project as a bilateral effort (Zhao, 2002a). A formal memorandum of understanding was signed by the US Education Secretary and the Chinese Vice Minister of Education in late 2002 (USDOE, 2002). As a result, developers in the US began the process of creating a program to teach English to the Chinese, while the Chinese simultaneously began developing a program to teach Chinese to English speakers.

In both China and the United States, a variety of entities were involved in the ELL project development. Participants in the US portion of the project through 2006 included the USDOE, which provided the financing, overall administration, and supervision through 2006; Northrop Grumman, which provided administration; Little Planet Learning, which provided technical and program development; and the Educo language team (the authors of this article), who provided language expertise. This paper focuses on the Educo language team and its involvement in the different levels of program development.

Initially, the action plan for the ELL project called for an advisory team in each of the two countries to create a set of frameworks for each country’s respective language program. The project coordinators for each country then hired a set of language and computer software specialists for their portion of the project and provided them with the appropriate frameworks. While the US and China-focused teams generally worked independently, they shared technology and support with one another as they built their individual language programs. The construction continued in 2007 with the English and Chinese projects operating separately.

APPROACHES TO LANGUAGE TEACHING

This US-China collaboration highlights an important shift in China’s approach to English language instruction. Traditionally, China’s primary focus has been on the development of English language reading ability. However, the Chinese government is now taking a much greater interest in promoting a communicative approach that emphasizes both oral and written skills (Fang & Warschauer, 2004). English instruction has been recently mandated to begin in Grade 3 (9-year-old students) rather than in Grade 6. In addition, the government has paid an increasing amount of attention to adding technology to language instruction in recent years. By 2001, “China had nearly 100,000 elementary and secondary schools that had integrated new technologies, involving 50 million students, 3 million computers, and 150,000 computerized classrooms (Huang, 2001)” (as cited in Fang & Warschauer, 2004, p. 303). Two key elements influencing this shift were China’s recent entry into the World Trade Organization and its selection as the host site for the 2008 Olympics (Fang & Warschauer, 2004).

Foreign and second language programs in the United States have also added a significant amount of computer technology to their instructional programs over the last 20 years. As the technology has become more available, educators and researchers have created a number of program options to enhance their instructional settings. In the course of this technological development, a paradigm shift in educational technology usage has occurred (Luke, 2006). A number of studies document this refocusing of interest from an earlier emphasis on a more drill-and-skill computer-aided instruction (CAI) approach to current richer usages involving multimedia-enhanced, interactive, and intelligent CAI models (Zhao, 2002b). In synthesizing best practice options for this expanded technological role, Chapelle (1998) articulated seven hypotheses for ideal second language acquisition (SLA) conditions as they relate to multimedia computer-assisted language learning (CALL). These hypotheses include:

1. Making the linguistic characteristics of target language input salient to the learner,
2. Providing assistance to learners to facilitate comprehension of semantic and syntactic aspects of linguistic input,

3. Providing learners with opportunities to produce target language output,

4. Giving learners the opportunity to notice the errors in their own output,

5. Providing learners with opportunities to correct their linguistic output,

6. Engaging learners in target language interactions with structures that are flexible enough to allow for negotiation of meaning, and

7. Engaging learners in L2 tasks that are designed to maximize the opportunities for rich interaction.

According to Chapelle, “because CALL software can actually play a role in input and interaction, it is useful to consider it as a participant in L2 tasks” (1998, p. 7). This perspective, in fact, became one of the guiding principles in the development of the ELL program because one of the basic assumptions was that the program needed to be fully self-contained and perform in partnership with the learner.

Warschauer (2000) characterizes the current approach to CALL software as “integrative” in contrast to the “structural” or “behaviorist” software of the 1970s and 1980s and the “communicative” software of the 1980s and 1990s. Integrative CALL makes use of multimedia and the internet, focuses on authentic discourse used in social interaction, and seeks to develop accuracy, fluency, and agency. According to Warschauer and Healey (1998), integrated CALL includes task-based, project-based, and content-based approaches. As will be shown in the following sections of this article, the ELL program that was developed demonstrates the characteristics of integrative CALL: it was intended to be web-based with users completing tasks by interacting with characters on the screen. Various activities throughout each unit focus on accuracy of grammar, fluency of usage, and appropriateness of choices.

PROJECT BACKGROUND

The English portion of the overall ELL project was given a 3-year, $3 million funding cycle (USDOE, 2002). Its stated purpose is to move teen learners from beginning to intermediate level in English, with an emphasis on developing listening and speaking skills. To do this, the English ELL program must provide a motivating context for learning and options for differentiation of learners, both at different learning levels and at different rates. Given the binational nature of the ELL project, the US program developers coordinated closely with the Chinese curriculum developers on certain elements of the program. The USDOE also directed that information about different cultural aspects of the United States be integrated into the language content of the program to promote positive international relations.

At its initiation, the USDOE panel contracted a researcher at Michigan State University to review the existing research in order to examine the effectiveness of using different technologies in second and foreign language instruction (Zhao, 2002b). The reviewer completed a meta-analysis of nine experimental design studies. Five of these studies (Adair-Hauck, Willingham-McLain, & Youngs, 2000; Cahill & Catanzaro, 1997; Harless, Zier, & Duncan, 1999; Labrie, 2000; Nutta, 1998) compared CALL applications to traditional instructional modes. One study (Al-Seghayer, 2001) compared two groups of students using different aspects of CALL instruction. The three remaining studies explored the use of video technology in lan-
guage instruction (Herron, Cole, Corrie, & Dubreil, 1999; Herron, Dubreil, Cole, & Corrie, 2000; Weyers, 1999). The results of the meta-analysis supported the premise that CALL applications were as good as, if not better than, traditional classroom instruction (Zhao, 2002b) (see Table 1).

Table 1
Results of Studies Reviewed by Zhao (2002b)

<table>
<thead>
<tr>
<th>Study</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adair-Hauck et al. (2000)</td>
<td>In technology-enhanced treatments versus traditional approaches, students performed equally well in cultural knowledge, speaking, and listening; however, the technology group performed better in reading and writing.</td>
</tr>
<tr>
<td>Al-Seghayer (2001)</td>
<td>In the hypermedia environment, video and text definitions were found to be more effective for vocabulary acquisition than still photos and text definitions.</td>
</tr>
<tr>
<td>Cahill &amp; Catanzaro (1997)</td>
<td>Students’ development of writing skills in an online foreign language course can exceed those obtained in a traditional course.</td>
</tr>
<tr>
<td>Harless et al. (1999)</td>
<td>Reading/speaking skills increased significantly, and listening skills increased convincingly when students used a speech-activated CD-ROM conversation program.</td>
</tr>
<tr>
<td>Herron et al. (1999)</td>
<td>Video helped students significantly improve their overall knowledge of the culture associated with the target language.</td>
</tr>
<tr>
<td>Herron et al. (2000)</td>
<td>Video helped students develop a significantly better understanding of the target culture.</td>
</tr>
<tr>
<td>Nutta (1998)</td>
<td>Students using a multimedia computer program as opposed to traditional delivery form for verb tenses performed as well or significantly better.</td>
</tr>
<tr>
<td>Weyers (1999)</td>
<td>The addition of authentic video versus nonvideo significantly improved student listening comprehension, oral production, and communicative competence.</td>
</tr>
</tbody>
</table>

Zhao (2002a) used these findings to assert that the ELL project could offer significant language acquisition options to learners by providing better access to linguistic and cultural materials, offering opportunities for communicative interactions with the instructional program, providing a variety of feedback mechanisms (including immediate feedback and opportunities for tracking and analyzing student errors/behaviors), and adding a technologically based freedom to the process by providing effective language instruction independent of a traditional classroom. Supporters of the ELL project then used this research in part to justify the program’s potential for viability.

The Educo language team was brought into the development at midpoint of the funding cycle. The initial role of the language team was to develop the language syllabus and gen-
eral story line for the program, to recommend activity structures (or “engines”) and games for language development, and to review materials from the language and culture perspectives at various stages of the program development. In the subsequent phase of development, members of the language team gradually shifted from taking an editorial role (i.e., reviewing initial scripts) to a position of active authorship for both the set-up scripts and the text in the “Reading Machine”—a short reading passage with multiple links to the relevant vocabulary and grammatical structures as well as links to pertinent cultural information. (It is in the Reading Machine passages that new elements of the English language are thoroughly treated.)

**Application of CALL Theory**

During their involvement in structuring the language instructional modules for the English ELL program, the Educo team generally followed the guidelines for multimedia CALL development that were articulated by Chapelle (1998). As a result, the English program that they produced

1. focused on making key linguistic characteristics salient by using a variety of highlighting mechanisms during presentation. For example, different elements of grammar, vocabulary, and cultural information were color coded and linked to a variety of expansions and explanations.
2. provided learners with multiple opportunities for the modification of its linguistic input. These included variable presentation speeds, numerous non-verbal cues, unlimited opportunities for the repetition of key elements, and both visual and aural input modes.
3. included numerous opportunities for “comprehensible output” during the course of each unit (“episode”). For example, students could write emails, respond to verbal cues, and choose the correct option from a menu of choices.
4. contained feedback mechanisms so that learners were able to identify their output errors. For example, learners who provide a verbal response that was not within the accepted parameters of the program received computer-generated feedback such as “I’m sorry?” or “I don’t understand.”
5. provided learners with opportunities to self-correct errors in their output. If unable to self-correct, learners were directed toward review opportunities before proceeding to subsequent activities.
6. provided numerous opportunities for modified interaction between learners and the computer, in both text and speech recognition modes.
7. was designed to involve learners as participants in the various L2 tasks. It featured a learning path of 36 “episodes,” with each episode featuring a “quest.” To provide continuity, the program includes an overall storyline in which Chinese language learners traveled to the US to study English and stay with US families. In each episode, users learned certain language elements in order to help a Chinese character in the stories to achieve a goal or solve a problem. The language elements included “phrases” (groups of words used as “chunks” without division or analysis), grammar, and vocabulary. For example, learners might need to make a new friend, gather supplies for language camp, select games and activities, coordinate with host family members to use the shower, or ask for directions to a specific location. Users completed a variety of activities to develop the language needed for the task, receive “coaching” to provide formative feedback and further practice as needed, and then demonstrated success in learning the language by accomplishing the episode’s goal.
**Curriculum Development Components**

The language team wrote the following elements that comprise the language path (see Figure 1):

1. an Introduction and language preparation for the story;
2. a short Video Story to set up the quest;
3. a Reading Machine (see Figure 2 below) activity to practice the language of the story that includes hypertext links for support on vocabulary, grammar, and cultural information contained in the story, along with opportunities to listen to the story, read the story, and answer questions to check comprehension;
4. a Vocab Lab with a variety of activities from a suite for vocabulary practice;
5. a series of games from a suite for additional practice;
6. a Gatekeeping Quiz to provide formative assessment and return users to appropriate alternate learning activities as needed;
7. several assessment/coaching opportunities, including a pronunciation coach; and
8. final Application & Assessment of the achievement of the language goals, including voice recognition challenge.

**Figure 1**
Learning Path through English ELL Program
For each of the 36 episodes, developers provided components in each category in Table 2.

Table 2
Curriculum Development Components

<table>
<thead>
<tr>
<th>Storyline</th>
<th>Language function</th>
<th>Problem focus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practice activities</td>
<td>Game activities</td>
<td>Coaching activities</td>
</tr>
<tr>
<td>Target vocabulary</td>
<td>Recycled vocabulary</td>
<td>Enrichment vocabulary</td>
</tr>
<tr>
<td>Target grammar</td>
<td>Recycled grammar</td>
<td>Enrichment grammar</td>
</tr>
<tr>
<td>Target phrases</td>
<td>Recycled phrases</td>
<td>Enrichment phrases</td>
</tr>
<tr>
<td>Setup Story exit quiz</td>
<td>Practice quiz</td>
<td>Application activity</td>
</tr>
</tbody>
</table>

To give a clearer view of how the learning path was actualized, synopses/samples of the components of Episode 9 (Home Sweet Home) are listed below.

**Introduction and language preparation for the story**

Brief background information is provided about the upcoming video story, with a limited number of relevant words and phrases. The information is provided by a “robot” voiceover reading English text with Chinese translations on screen. The words are highlighted as the robot says them.

**A short video story to set up the quest**

A Chinese student (Ping) gets a minitour of her American host family’s home [not primary focus of episode but useful information; included in culture notes]. She then sits down with the family to discuss daily scheduling [primary focus of episode]. The video ends with the episode goal, that is, helping Ping to write a new family schedule including her personal scheduling information.

**A Knowledge Bridge Assessment at the end of the video story to test basic comprehension of the storyline**

Ping’s host mother wants to plan dinner. She asks Ping, “What time do you eat dinner?” What does Ping say?

- I eat breakfast at 6:30.
- I eat dinner at 6:00.
- I go to bed at 10:00.
A Reading Machine activity

The Reading Machine activity (see Figure 2 below) is designed to practice the language of the story and includes hypertext links for support on vocabulary, grammar, and cultural information contained in the story, along with opportunities to listen to the story, read the story, and answer questions to check comprehension. (For other examples, see the Reading Machine discussion below.)

A Letter from Ping to Lu, another student from China

Dear Lu:

How are you? I am fine. I like my family. This is my house. This is my room. This is the bathroom and the kitchen. What’s in your house?

In China, I always get up at 6:15 a.m. I go to school at 7 o’clock. In America, I am going to have a different schedule. I am going to study in the afternoon. I’m going to study at night, too. What time do you get up? Get up means wake up in the morning. When do you study?

My family likes weekends. They usually eat a big breakfast on Saturday. Do you eat breakfast on Saturday? The Johnsons like sleep. They never get up before 10:00 on Sunday!

I miss you!

Ping

A Vocab Lab with a variety of activities from a suite for vocabulary practice

Game options included Word Wizard, Hidden Treasure, Falling Jewels, and a Sports Game (i.e., shooting a ball and scoring a goal by getting the right answer in an exercise). Additional practice Games that were considered include Sentence Scramble, Concentration, Cats and Dogs, Picture or Sound Bingo, Simon Says, and other Sports games (e.g., shooting baskets, soccer goals, hitting baseball, etc).

Sentence Scramble

Words appear all mixed up in a grid. Students click on letters in sequence to form sentences such as

I usually get up at 7:00.
I often study after lunch.
When do you eat breakfast?
What time do you take a shower?
When do you use the computer?

One activity that is often included in the suite of games and activities is Karaoke which includes an interactive jazz chant using key language from the episode for student listening and speaking practice.

In addition, at the end of every seventh episode, a cumulative review section addresses the assessment of listening comprehension, reading comprehension, vocabulary, speech production, and fluency (using phrases rapidly in context).
FROM THEORY TO APPLICATION

In some applications of technology for language learning, the pedagogical principles that guide our classroom practices somehow get lost in the desire to capitalize on the capabilities of the computer. When we began working on the ELL project, the primary focus was on using speech recognition to allow users to interact with characters on the screen. While this is an innovation that has great promise for language education, we were concerned that the other elements of the ELL system also be consistent with current theory and practices. We drew on current theories and approaches to language teaching in determining what vocabulary to include and how to sequence the grammar structures.

Promoting Vocabulary Acquisition

Although there is some disagreement with the idea that learners can acquire language strictly through reading, there is widespread acceptance of the idea that vocabulary is best acquired in context through multiple exposures, through both incidental and intentional learning (Rott, 1999; Hulstijn, 2001) and through presentation in contexts that are relevant to the learners (Coxhead, 2000, 2002b). In the English ELL program, this happens in two stages: the initial presentation of an oral dialog, with written script available to students for practice, and a follow-up reading text, which will be discussed in greater detail below. In many situations, it is possible to perform a needs analysis to determine what vocabulary learners need to achieve their goals. For example, students in K-12 schools in the US need classroom vocabulary (i.e., academic vocabulary) to understand the material at their grade level and communicative vocabulary to interact with other students. In the case of the English ELL project, a needs analysis was not helpful. The program is intended for students approximately 12-16 years of age living in China. Most, with the possible exception of some students in major cities, will not have any interaction with speakers of English for many years and have no immediate need for English other than passing their coursework and exams. Though we had a copy of the oral exam topics and textbooks from one area of China, we were encouraged not to base our curriculum on what was currently being used but rather provide the language we thought would be the most useful. We looked at frequency word lists, including the Brown corpus (Edict Virtual Language Center, 2005) and the Harenet-Toppage list (2006) compiled from a number of sources (http://www1.harenet.ne.jp/~waring/vocab/wordlists/vocfreq.html). One immediate problem we discovered with frequency lists is that most have come from corpora which include primarily written texts. The Brown Corpus, for example, one of the most commonly referenced frequency lists, was compiled from published texts in American English. It is also outdated since the texts were sampled in the 1960s (Lee, 2005). For example “Soviet” is included in the Brown list but now would only occur in historical texts.

The biggest problem with using a frequency list was immediately evident as we created the first episode in which the characters go to a language camp and meet the other “campers” and another episode in which the campers get supplies by asking for pencils, notebooks in different colors, and paper. We discovered that the frequency lists did not include words such as “hello,” most colors, “pencil,” “pen,” and other words essential to the episode. These are words that occur mostly in oral language or in school settings.

While more recent corpora have included more oral language, the sources still tend to be formal examples such as speeches. Possibly the most comprehensive corpus, the Cambridge International Corpus, which includes 600 million total words from both oral and written texts, is only available to those writing books for Cambridge University Press (Lee, 2005).

We hoped to find a vocabulary list representative of words typically acquired by English
language learners. The Centre for English Corpus Linguistics (CECL; http://cecl.fltr.ucl.ac.be) is compiling a corpus of samples from EFL students around the world (again, from written sources), but a frequency list is not yet available. In any case, there is some evidence that the vocabulary of EFL learners reflects what is in their textbooks, not necessarily what they need to know for particular purposes. However, CECL’s research may shed light on what words learners tend to acquire and use rather than the usual vocabulary tests which require only passive recognition.

Because of the work of Coxhead and others on the importance of context for vocabulary acquisition, we decided to make the relevance and interest of the topic the primary driver of the curriculum. We included vocabulary from the frequency lists when they fit the topic naturally and supplemented the curriculum with vocabulary as needed, especially words for concrete objects in the students’ experience.

SELECTING GRAMMAR STRUCTURES

We agree with Krashen and others (Cook, n.d.) that grammatical structures are not necessarily acquired when they are taught, but rather when the learner is ready for them. While we have some knowledge of the sequence of acquisition for most learners (e.g., the third person singular “s” is acquired much later than the plural or possessive “s”), it is difficult to predict when individual learners will be ready to acquire a particular structure. For this reason, we spiraled the grammar—cycling elements through our enrichment, target, and recycled categories so that we were sure that learners had multiple exposures to important elements. Structures may appear in an episode as an “enrichment” but without any requirement for the users to use or produce the structure; they may appear later as “target” structures with practice exercises and then as “recycled” structures in further episodes for users to have additional practice.

We also separated elements of grammar that are sometimes presented as a unit into components to introduce them gradually. For example, the sequence for possessive adjectives is as follows:

- **Episode 4:** Possesses *my, your* as target structures
- **Episode 7:** Possesses *his, her* as target grammar; *my, your* recycled
- **Episode 8:** Possesses with proper names as target grammar: possessive *our* as enrichment grammar; possessives *my, your* recycled
- **Episode 19:** Possessive *their* as target grammar, possessives *his, her* recycled

**Focusing Attention and Input Processing**

We also agree with Diane Larsen-Freeman (2001) that focusing the learner’s attention on a grammar point can accelerate the acquisition process. Exercises in the “Reading Machine” are designed with this in mind. VanPatten’s (1996) input processing is essentially a way of focusing learners’ attention on a grammar point by exposing learners to the grammar in listening or reading and asking them to do something with the content that requires processing the grammar structure. For example, learners might have to listen for the past tense ending to tell whether something happened in the past or present. Redundant information (e.g., time phrases) is removed to direct learners to notice the grammar point. An important feature of
input-processing exercises is that the questions asked of learners may not have a right or wrong answer. In fact, it may be more effective to have learners process the input in order to express an opinion instead of simply having them respond with factual information. According to VanPatten, input processing exercises

1. guide learners to focus on form to get meaning;
2. teach only one grammar point at a time, although the point may be contrasted with a previously acquired point;
3. keep meaning in focus;
4. reduce redundant information in the input;
5. require learners to do something or respond in some way to the input;
6. can use either oral or written input;
7. can ask learners to process for opinion rather than correct answer;
8. are used before students are asked to produce the forms orally or in writing; and
9. should move from sentences to connected discourse.

The Reading Machine

The Reading Machine (an early prototype is shown in Figure 2) allows users to read a short text, listen to it, record themselves reading the text aloud, and replay and self-evaluate the recording before moving on to the exercises.

Figure 2
Reading Machine
The texts in the Reading Machine are related to the problem set up in the opening scene of the episode and often give learners additional information they will need to accomplish the quest. For example, in Episode 9, one of the characters in the story is getting to know his host family and the schedule of the household. In the opening scene, it is established that the host father gives the character a schedule with activities such as showering, eating breakfast, leaving for school, using the computer, and so on, with blank spaces for the times. (The schedule also indicates the room in which the in-house activity occurs.) He tells the character to check with the host brother and sister about the schedule, find out what time the family eats breakfast, and so forth, and work out times for sharing the shower and computer with them. The text in the Reading Machine is the uncompleted schedule shown in Table 3.

Table 3
Family Schedule

<table>
<thead>
<tr>
<th>Tony</th>
<th>Lani</th>
<th>Fei</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Family schedule:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eat breakfast in the kitchen</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leave for school</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eat dinner in the dining room</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sharing:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Take a shower in the bathroom</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use the computer in Tony’s room</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use the telephone in the living room</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bedtime (no noise!)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Learners will use this vocabulary in the application section at the end to ask the characters on-screen questions such as “What time do you take a shower?”

Since the purpose of the English ELL program is primarily to develop oral skills and because the learners are relative beginners, these reading texts are usually quite short and often include graphic elements. For example, in the episode in which the character goes to a new high school for the first time, the “text” is actually a map of the school with rooms such as the cafeteria, office, gym, classroom, auditorium, restrooms, and locker rooms labeled. A key below each room has a brief description of the purpose of the room. This information is used in the application when the user has to ask directions to find a specific classroom.

**Reading engine activities**

After working with the whole text, users move on to several exercises with variations of the text. First, a second version of the text appears with hypertext links to supporting materials such as definitions, visuals, translations, and sounds. This takes full advantage of the multimedia capabilities of the computer to support language acquisition (McCloskey & Thrush, 2005). For example, in an episode in the second half of the program, the character goes to a volunteer fair and must ask questions to learn more about several volunteer organizations. The text is a flyer advertising the fair, resembling those in Figure 3.
Figure 3
Volunteer Fair

**Volunteer Fair**
**Tuesday, 9-12 a.m.**

**Transportation Alternatives** wants people to ride **bicycles**, walk, and take the **subway** instead of driving cars. Cars make a lot of noise and pollute the air.

**Volunteers:** Help us send information about the benefits of bicycling. **Stuff envelopes and lick stamps.** No skills needed.


**Kitty Kind** works to help cats. They find homes for cats. On weekends, they take cats to stores where people can meet the cats and choose one to take home.

**Volunteers:** Clean the cages for the cats, pet them and feed them. You must love cats to work for Kitty Kind.


The text in the first flyer has color-coded hyperactive text linking “transportation” to a definition of transportation, “bicycle” and “subway” to illustrations, “stuff envelopes and lick stamps” to a short movie showing someone doing those activities, and “wants” to a grammar note about the third person singular ‘s.’ There may also be a short culture note, in Chinese, on a topic such as volunteering or the popularity of pets in the US.

The next activity is Text Reconstruction in which a mouse click causes every **nth** word in the text to “fall out” and appear at the bottom of the screen. Blank spaces appear in the text where the words were originally located. Users drag the words into place to reconstruct the text. They can perform this activity more than once, with more and more words falling out each time. In the first iteration, every eighth word may fall out, in the second iteration every fifth word may fall out, and in the third iteration every third word may fall out. This gives repeated interaction with the text and requires greater familiarity with the text each time.

Next come the input-processing exercises. Users are asked a series of questions about the text. Some questions may require only yes/no or true/false answers, others may elicit agree/disagree statements, and still others may check comprehension. The samples below illustrate yes/no questions and agree/disagree questions.

**Yes/no questions**
Volunteers for Transportation Alternatives need to know how to ride a bicycle.
Volunteers for TA will put information in envelopes.
Volunteers for TA will help stop pollution.
More powerful exercises will ask users for an opinion.

Agree/disagree questions
Cars pollute the air more than subways and buses do.
Riding a bicycle is more dangerous than riding in a car.
Cars make more noise than buses do.
The subway makes more noise than cars do.

In this sample, attention is being drawn to the comparative structure “more than.” Users respond to these sentences by clicking on an “agree” or “disagree” button. There is no evaluation of the student answer, however, since there is no right or wrong answer to these questions. Users come to understand that in the ELL program, they need the language learned in early exercises to perform adequately in the application section.

We look forward to evaluating the effectiveness of this approach to grammar and vocabulary acquisition once the ELL software is in use. There is every reason to believe that applying accepted pedagogical practices to computer applications can only strengthen them and make them more useful in supporting classroom teaching.

**STRENGTHS AND POTENTIAL OF THE ONLINE PLATFORM**

An online platform like ELL’s has immense potential for providing individualized programming and pacing that take into account learners’ different language levels, learning styles, and learning rates. Language input can be provided through a variety of means: listening, viewing, speaking and receiving feedback, playing games, and achieving quests. Information in multiple modes (e.g., visual, auditory, and kinesthetic) can be presented simultaneously or sequentially. Formative assessment can be integrated and applied immediately to subsequent learning, providing differentiated paths for different learners. Visual and auditory resources available for use in the program are as unlimited as the web. The online platform provides opportunities to engage learners with active roles in games, activities, and problem solving and gives learners the ability to control their learning with real choices regarding language level, goals, and activity types.

**CHALLENGES OF THE ONLINE PLATFORM**

The online platform presented six large challenges.

1. Although rapid advances are being made in voice recognition, current technology still offers somewhat limited capacity to interpret learner responses. The ELL program was able to use voice recognition technology to assess only a few spoken words at a time and depended on other types of assessment for most purposes. In order for more extensive language interactions to occur in goal-oriented conversations, the technology will need to advance to the point at which the program includes a significant “knowledge base” about the target of the conversation that will allow it to function beyond the single sentence level.

2. An online program must include cultural elements and thus may need to be revised and/or redeveloped for use with learners at different ages and from different language and cultural backgrounds. In developing the ELL pro-
gram, translations of difficult instructions and cultural information were provided specifically with teenage Chinese users in mind. Significant changes will be needed to adapt the program to a different population.

3. To create effective online learning, developers must look beyond and then go there. Because of the wealth of possibilities, it is necessary to carefully clarify learning goals and curriculum to provide a clear direction in programs. In ELL, we looked at the language we wanted users to acquire and the technology available and imagined an ideal program. We then collaborated and compromised to develop the best program that was financially and technically feasible.

4. It is very difficult to conduct formative field testing of the effectiveness of software before it is completely developed. Developers must carefully study the research about effective language teaching and learning and the history of other online programs, textbook programs and other media. Then they must make a best guess and take considerable risks in time and money to develop the software. This was the process used in the ELL project.

5. To make use of all the possibilities of technology, significant complexity is demanded of design, and the program elements must be tracked for curriculum consistency. We worked to develop a tracking system that would accommodate the elements we chose to include.

6. Effective learning software requires integration of technology and language pedagogy. Generally, technicians do not know much about language instruction, and content developers do not know much about technology. Careful, ongoing collaboration is required.

MANAGING CONTENT

One of the challenges associated with developing the ELL project was managing and tracking the complex program elements. Prior to developing the materials for the ELL program, we clearly saw a need for a management system that would help us to track the content we intended to introduce and also recycle in the 36 episodes of the program. Discussing our need with the technical development team, we arrived at the conclusion that an online database would assist both the writers and the technical team with their respective tasks. Consequently, a database system was developed for the use of both the language team and the technical team during the development of the project.

Categories

The database was organized by individual episode: data were entered and were accessed by episode numbers. For example, to view the content of Episode 10, we selected Episode 10 from a main drop-down menu. For consistency and easier crosschecking of information, the organization of the menu for each episode was designed to correspond to the elements of the episode path and consisted of

- Title and Storyline
- Language Functions
- Vocabulary
- Phrases
- Quizzes
- Grammar
- Practice Activities
- Practice, Coaching, and Play
- Cultural Notes
The data for each episode were entered once the episode was completed, reviewed, and revised. The specific format of the data entry depended on the menu item. Most categories either required direct entry of the content (e.g., entry of the text of a storyline; see Figure 4) or allowed a selection of items from an existing list (e.g., list of practice games). On the other hand, the Vocabulary, Phrases, and Grammar categories each included three levels: target, recycled, and enrichment. The data for these categories were either newly entered or were selected from lists that were automatically generated from previous episodes (see Figure 5).

Figure 4
Interface for Entering Data for Storyline
Once the content data were entered into the database, we were able to access the content by looking at the database itself or by requesting a report that would provide us with accurate information about previously used language items. Theoretically, many kinds of reports could have been built into the system, but, for the purpose of developing individual episodes, we only requested data reports in the categories described above for both the current episode and for the cumulative curriculum up to and including that episode. The reports, based on the criteria selected, generated accurate and tabular summary information about which language items had been used and also supplied information about the frequency of occurrence of words, phrases, and grammar structures in individual episodes.

**Usage**

The database was a very useful tool during the writing process with certain caveats. When designing individual episodes, the content manager helped us to keep track of which language items had been introduced and when so that the curriculum could be appropriately sequenced. We used the database to track the frequency of words, phrases, grammar structures, and functions across program components to guarantee that they were sufficiently
recycled for the language learners. We also used the database to identify language items for intended repetitions in the recycling process and to prevent “unintended” repetitions in individual episodes. However, the database was created in the middle of the initial writing process when a number of episodes had already been completed. The database manager had to enter all of the data from the previously completed episodes at the same time that the writers were generating new episodes, which created an unavoidable lag time in the availability of data on completed episodes. Thus, for the grammar and vocabulary elements, a simple spreadsheet was used to augment the information in the database. With the vocabulary data, the need for the spreadsheet decreased as the database development continued.

Once the curriculum was finished and all the episodes were entered into the database system, the database became fully available to the technical team. At this point, it was ready to serve a variety of important purposes as the episode frameworks were transformed into actual scripts and full-text lessons. Among other uses, it allowed fast search and retrieval of content according to various criteria to use in building the ELL system and permitted the developers to generate language items for specific activities, games, and the language engine.

Early in the development process, the online database was an effective common tool for the two teams involved in the project. It made the process more efficient by allowing effective use of the language development team’s work by the technicians. However, in the final analysis, because of the many changes required by the various individuals and groups involved in the project and because of the pressure to meet short deadlines, the database became unwieldy and the technical team abandoned it.

CONCLUSION

The initial ELL project team attempted to meet the challenges of developing oral/aural proficiency in language using an online platform. The results thus far make limited use of voice recognition technology for assessment, while integrating cultural elements for the targeted audience, developing a program with optimal learning potential, and integrating the best possible use of technology that is both technically and financially feasible. The team focused on clarifying learning goals and curriculum, providing means to track these to provide direction for program development, making research-based decisions to inform development, and providing careful and ongoing collaboration between technicians, content developers, and language educators.

There is little doubt that, as technology continues to play an increasingly important role in language classrooms, an innovative program such as the ELL project, which incorporates both features of pedagogy currently considered to be best practices as well as the most advanced capabilities of technology, has the potential to add significantly to the world of foreign language instruction. We hope that, once the program has been completed and both usability and effectiveness research studies have been conducted to refine and improve it, the ELL project will provide English teachers and learners in China with a very useful tool that they can use as they strive to realize the Chinese government’s goal of promoting truly communicative English language development among the millions of students in that country.

In the summer of 2006, the USDOE posted the content script and the code for the project as developed so far on the web, inviting organizations to propose a collaborative plan to complete the project (http://www.ed.gov/admins/lead/academic/ells/index.html). The Hewlett Foundation (Hewlett Foundation, 2008; http://www.hewlett.org) has since that time funded the continuation of the project through Coastline College in Fountain Valley, California,
as part of the Foundation’s Open Education Resources Initiative. The project, now called Open Language Learning Initiative (OLLI), is using the curriculum goals as described here but is taking new directions with the story line and incorporating additional features of voice recognition and gaming. The program expects to pilot materials in China in winter 2008/spring 2009 and make a product available shortly thereafter. In addition, a version of the program for Spanish speakers is anticipated.

In the meantime, we hope that others working with language teaching through technology may benefit from what we have learned from the research, curriculum development, and program development for the project.

REFERENCES


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