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# Investigation of a multimedia approach to teaching spoken English

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Investigation of a multimedia approach to teaching spoken English

by

Hye-Ryon Cho Hong

A thesis submitted to the graduate faculty  
in partial fulfillment of the requirements for the degree of

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Major Professor: Carol A. Chapelle

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Ames, Iowa

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Graduate College  
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This is to certify that the Master's thesis of  
Hye-Ryon Cho Hong  
has met the thesis requirements of Iowa State University

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Major Professor

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For the Major Program

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For the Graduate College

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## CHAPTER 1. INTRODUCTION

### Introduction

I have been interested in teaching English as a foreign language to Korean students since I majored in English Education in college. Korean students study English as a foreign language beginning in middle school (very recently beginning in the 3<sup>rd</sup> year in elementary school) (Park & Oxford, 1998). Most Koreans study it 4-5 hours a week at least for 6 years until they graduate from high school. However, it is very rare to find a student who can communicate well with an English speaker. In fact, many of them can not express themselves in spoken English. Such a lack of good speakers results from many factors such as a lack of good English-speaking teachers, too many students in a class, grammar-based education, and lack of good lab facilities.

According to Krashen (1982), language is acquired when learners receive input which is a little bit beyond their ability level and contains new linguistic material. In other words, when learners have comprehensible input, they can acquire the language. Since Krashen's input hypothesis (Krashen, 1982), many researchers (Long, 1985; Pica, 1994; Allwright & Bailey, 1991) agree that interaction is essential to have comprehensible input. That is, when learners have unknown and confusing input during conversation, they can ask questions, or request clarification or repetition. These interactional modifications are believed to promote language acquisition. Therefore, it is assumed that the second language (L2) is learned when interaction takes place in the target language. Interaction gives opportunities to learners to comprehend message meaning, to produce modified output, and to attend to L2 form which are principal factors in acquiring the language (Chapelle, 1997).

From the perspective of interactionist second language acquisition (SLA) theory, it is easy to see that the Korean English classroom lacks interaction. The classroom tends to be teacher-centered where the teacher teaches English grammar rules and translation. Teachers and students don't have interaction in spoken English because most English teachers are non-native speakers and they are not trained to teach spoken English. Thus, it would be necessary for Korean students to have an environment of good interaction to improve their spoken English.

Technological developments have drastically increased access to spoken English through audio, video and computers. Audio and video are oriented to the listening skill and are not as interactive as students need to learn good speaking skills. I hypothesize that the use of computers with the recently developed computer-assisted multimedia will interact with the learners effectively to teach spoken English to Koreans. It was also pointed out that one of the important features of multimedia approach is interactivity (Raphan, 1996). The computer might provide interactive and learning opportunities for L2 students. This feature of the multimedia method has been studied recently with general ESL (English as a Second Language) adult learners (Hsu, 1994; Park, 1994), but in my study the learners focused on are Korean elementary school children.

### **Purpose of the Study**

The purpose of this study is to investigate how the learners will interact with multimedia that delivers pictures, audio, and various interactional modifications in teaching spoken English to Korean elementary school children who are currently taking ESL courses or having lessons from private tutors in the USA.



### Definitions

- **Multimedia:** refers to the combined use of several media, as sound (audio) and full-motion video in computer applications.
- **CD-ROM (Compact Disc-Read Only Memory):** refers to a storage that uses laser technology to present audio or video displays, or to store large amount of digitized read-only data. CD-ROM is generally much smaller than videodisks, but have great storage capacity.
- **CALL (Computer Assisted Language Learning):** refers to a language learning technique in which the students interact with instructional language stimuli at a computer terminal on a one-to-one basis.
- **ESL (English as a Second language):** refers to English that is taught to or is learned by students to whom English is not their native language, but their second language.
- **Interactional modification:** refers to a process of modifying the interactional structure of conversation between two (or more) speakers.
- **Listening activity:** In this research, students listen to the corresponding sentences describing a person in English in 'SmartStart English' multimedia CD-ROM program. In the activity, students find a person that the program describes, by clicking the mouse. They can use various interactional modifications such as whole sentence repetition, segmented sentence repetition, viewing help menu, etc.
- **Speaking activity:** In this research, this activity is a Bingo game in which a food is described in terms of their properties, not by their names in 'SmartStart English' multimedia CD-ROM program. Then they choose one of two food names that the program asks, looking

at the food chart on the screen. They can use various interactional modifications such as whole sentence repetition, segmented sentence repetition, viewing help menu, etc. They have to make a pronunciation of the food to a microphone.

## CHAPTER 2. REVIEW OF THE LITERATURE

Language learning in Korea still uses traditional grammar based methods, focusing on grammar and reading comprehension. Most EFL teachers in Korea are Koreans who are not trained in teaching spoken English. English is not an official language, and people don't use English in social interaction, so students have few opportunities to be exposed to spoken English. This is the reason why Korean students have limitation in acquiring spoken English. Even though they study English for 6 years from middle school to high school, they don't command fluent communicative English and they don't have self-confidence in using English.

To overcome this problem, multimedia CALL may provide second/foreign language students useful tools to help their spoken language acquisition. Therefore, in the first section, I will review the effectiveness of the multimedia approach (compared to other ones e.g. audio or video). Even though the purpose of my study is not on the effectiveness itself of the multimedia approach, some relevant literature has been reviewed because the multimedia approach has been used in this research and it would be helpful to understand the benefit of such an approach in CALL as background. In the second section, I will review interaction in SLA. From SLA research in the last two decades (Hatch, 1978; Krashen, 1982; Long, 1985; Pica, 1994; Allwright and Bailey, 1991; Chapelle, 1997), it is now well known that 'interaction' is very important in second language acquisition. Therefore, the review in this section will give a theoretical background of interaction in SLA.

My study investigates how learners interact with a multimedia CALL activity for teaching spoken English through description and analysis of the language of interaction among participants. Chapelle suggested the computer also be regarded as a participant in a

conversation (Chapelle, 1994). She also pointed out that it is important that CALL researchers should focus on the language, and *interaction*, of CALL participants (Chapelle, 1997). Thus, in the third section, I will review interaction in CALL. In the fourth section, I will review two studies focused on such interaction of ESL learners, one quantitatively (Hsu, 1994) and the other qualitatively (Park, 1994). Then, in the fifth section, I will review briefly the technology of speech recognition to understand the potential and current problem of such technology because the speaking activity of my research relies greatly on the recently developed speech recognition technology in the multimedia software. The young Korean children investigated have particular features in their interaction specific to Koreans. Therefore, a short summary of some general problems of Korean learners in speaking English is presented in the sixth section. Finally a summary of the literature review and the approach of my study are presented, followed by research questions of this study.

### **Effects of the Use of Multimedia on TESL/TEFL**

According to Pennington (1996), CALL provides a better quality of input because it provides a more focused and more individualized learning environment than other learning media. This would mean that CALL could increase various learning opportunities and the qualified learning experience in making input learnable and accessible to each individual learner. She also points out that different learning modes in CALL may increase the effectiveness of instruction for some learners. In short, she claims that CALL provides a better learning/teaching environment than the other learning media.

There have been several studies about whether or how much the multimedia approach using computer technology is beneficial for teaching in the ESL/EFL classroom. Here I will

introduce some of research focusing on different language skills: vocabulary acquisition (Douquette et al., 1998), reading (Chun & Plass, 1996), listening (Brett, 1997), and speaking (James, 1996; Egan, 1999). The research showed rather consistent results that the multimedia CALL is more effective for each of the areas.

Douquette et al. (1998) investigated if the highly textured linguistic and extralinguistic contexts provided by the multimedia environment stimulate vocabulary acquisition. The results showed that the multimedia environment stimulates lexical learning when it uses both explicit and implicit approach. That is, multiple occurrences of words in a variety of contexts such as animated images, still and pedagogical images, images supported by text promoted vocabulary acquisition.

Chun and Plass (1996) were interested in the question of how reading comprehension can be facilitated with multimedia application for language learning. The specific research questions were: (1) Is reading comprehension facilitated by an advance organizer video preview for top-down processing? (2) Is reading comprehension facilitated by multimedia annotations for bottom-up processing of single vocabulary items? (3) What is the relationship between look-up behavior of vocabulary items and comprehension? (4) What is the relationship between performance on the vocabulary test and comprehension? The results indicated that a dynamic visual advance organizer does aid in overall comprehension and that annotations of individual vocabulary items consisting of both visual and verbal information help more than verbal information only. Also, a moderate correlation between vocabulary knowledge and reading comprehension was found.

Brett (1997) investigated experimentally the effectiveness of computer-based multimedia for developing listening comprehension in English as a foreign language. The

research questions are: (1) Would learners of equal ability following the same pedagogic sequences and using the same input material but working with audio, video or multimedia perform differently on the same comprehension tasks? (2) Which medium is better for the language recall abilities? (3) What would be the reason for the differentials that were found in learner success rates among the three media? Results of performance on tasks showed more effective comprehension and recall while using multimedia than either audio or video plus pen and paper. The learner questionnaire showed possible reasons for the success of multimedia: The learners thought that the instant feedback by instant ticks and crosses help much to guide and reconstruct the message.

It was pointed out that “speaking is the heart of second language learning but has been somewhat ignored in teaching and testing for a number of logistical reasons” (Egan, 1999). While all the language skills but speaking seem to be benefited by teaching with multimedia, there is some controversy about the speaking skill as mentioned by James (1996): “Opinion on the relevance of computers for the development of oral skills has been mixed. Earlier writers (middle of 80’s) were inclined to be pessimistic, while later ones have been more optimistic. The research on CALL and speaking has supported the pessimists more than the optimists. The small amount of research on the issue generally finds that CALL programs alone are insufficient to promote rich oral interaction. Teachers cannot rely on courseware writers or the computer alone to provide or sustain oral interaction at the computer.” To overcome this, James (1996) pointed out a possible teachers’ role to modify a CALL-based activity in the class to make it more successful for speaking purposes. He also suggested that the techniques of the conversation class that promote interaction should be a model for CALL activities. He concluded that the future of CALL is not entirely decided by

improved hardware and software but that by integrating the technologies to suit recognized methodologies used by instructors in order to reach an interactive learning environment is the main goal.

### **Input and Interaction in SLA**

In order to understand the development of students' second language, we have to consider the importance of comprehensible input and interaction. Krashen (1982) hypothesized that to acquire the language, learners should receive comprehensible input that includes unknown linguistic materials at their level or a little beyond their level. He claimed that to make input comprehensible, language should be learned through extra linguistic support such as use of visuals, gestures, and context and use of texture features such as repetition, redundancy, and simplification. Later, Long (1985), Pica (1994), and Allwright & Bailey (1991) further noticed that the comprehensible input itself is not enough for the second language learners and asking questions, indicating confusion, or requesting clarification or repetition made by a non-native speaker to understand the input promote language acquisition. Second language researchers regard these adjustments as interactional modifications. Long (1985) categorized these interactional modifications in detail as functions such as confirmation checks, comprehension checks, clarification requests, self-repetition, other repetition, expansions, here-and-now topics, and topic-initiating moves through a number of studies on foreigner talk. The importance of interaction was observed in native speaker (NS)/non-native speaker (NNS) conversation. Long's research on NS/ NNS conversation (Long, 1983), for example, showed native speakers try to modify interaction because they want to avoid conversational trouble. This study showed that NS-NNS

conversation used more modifications than NS-NS. It should be noted that these modifications are in the form of interaction. Through these modifications, learners are aided to understand the meaning of the input they receive, that is, to make the input comprehensible.

Pica et al. (Pica, Young & Doughty, 1987) also showed the important role of interaction in their investigation of the comprehension of nonnative speakers of English on directions to a task presented by a native speakers under two input conditions: premodified input with decreased complexity and increased quantity and redundancy, and interactionally modified input with opportunities for interaction with the NS. This study showed that comprehension was most helpful when the content was repeated and rephrased in interaction and also showed that NS-NNS interactional modifications in the form of comprehension and confirmation checks and clarification requests served as a mechanism for NS modification of input, and thus played a critical role in comprehension. According to Swain (1985), comprehensible output is also valuable when it plays a role in helping learners convey meaning while looking for their linguistic resources. Swain and Lapkin (1995) explained that while producing the L2, learners will meet linguistic problems and noticing problems makes the learners modify their output and this process makes learners have much process in comprehension. Therefore, these interactional modifications are considered the principal factor in acquiring second language. Through these interactional modifications, second language learners have opportunities to negotiate meaning.



### **Interaction in CALL**

Chapelle (1997) pointed out “Time spent on learner talk is better than time spent on teacher talk; learners should have the opportunity to comprehend a variety of functions in the target language; learners should engage in communicative exchanges in the target language”. As Chapelle mentioned, second language researchers have emphasized the language of participants for language learning. Chapelle (1997) suggests that CALL research would benefit from the perspective and methods of SLA.

Now I would like to shift our concern to methodology to analyze such interaction in CALL environment. According to the definition by Chaudron (1988), interaction analysis is one of the four types of research methods of classroom language learning: psychometric, discourse analysis, ethnographic, and interaction analysis. For the interaction analysis, the researchers observe and analyze focused teacher and student behaviors during classroom instruction. Since interaction was hypothesized to be important in the language development (Long, 1985), interaction analysis has been applied to the study of CALL with both pedagogical and psycholinguistic motivations (Chapelle, Jamieson & Park, 1996). In the former case, researchers investigate how learners use software that is supposed to have instructional benefits, while in the latter case researchers sample learners’ interlanguage, and investigate language and strategies of learners as they develop their second language.

Researchers with pedagogical aims have studied some of the basic questions concerning learners’ interaction in CALL environments (Chapelle, Jamieson & Park, 1996): First, they investigated the difference of learners’ interaction on and off the computer. Researches revealed equivocal results on this question; The second question would be whether students use the language learning strategies which the software supports. A study

looking for an evidence of resourcing (defined as a cognitive strategy) revealed that learners used little resourcing in front of a lot of available options; Concerning another strategy, exploration, a lot of variation among learners was found; Finally the type of metacognitive strategies seem to be more important for learners working in CALL, because answers to the question, “What do individual learners do in the face of so many options?”, have become indispensable for understanding CALL.

In the psycholinguistically-motivated CALL research, strategies have been studied through observations, think-aloud protocols and retrospective self-reports, trying to better understand both the knowledge and processes (two types of capacities for language performance) used for language performance in CALL contexts (Chapelle, Jamieson & Park, 1996). Language knowledge includes vocabulary, syntax, illocutionary functions, and other aspects of language pragmatics. Process involves both the cognitive processes required for accessing language knowledge and the metacognitive processes that learners use to adjust and manipulate their language performance and acquisition. Computer-assisted methods now complement traditional observational and introspective methods because it is much easier to collect precisely the data to analyze learners’ interaction in CALL. Both pedagogically- and psycholinguistically-motivated interaction analyses are complementing to each other for better understanding of second language acquisition. Chapelle et al. (1996) cited that “future research of each approach is likely to come closer together to answer those questions in carefully constructed and instructional contexts”.

Because of the great importance of ‘interaction’ in SLA, it must be considered when choosing or developing multimedia programs for ESL/EFL. According to the review on some design features and evaluation criteria for multimedia CALL developed on the basis of

hypotheses about ideal conditions for SLA (Chapelle, 1998), we can also see the importance of interaction as well as the other factors. Since multimedia CALL is to be used in my research, it would be useful to summarize the hypotheses relevant for developing multimedia CALL, based on the model of SLA process in interactionist research and its supporting theory and research (Chapelle, 1998) :

1. The linguistic characteristics of target language input need to be made salient.
2. Learners should receive help in comprehending semantic and syntactic aspects of linguistic input.
3. Learners need to have opportunities to produce target language output.
4. Learners need to notice errors in their own output.
5. Learners need to correct their linguistic output.
6. Learners need to engage in target language interaction whose structure can be modified for negotiation of meaning.
7. Learners should engage in L2 tasks designed to maximize opportunities for good interaction. (pp. 23-25)

These criteria can be used as a guideline to select and/or develop appropriate multimedia programs for ESL/EFL.

### **Research on Interaction in CALL**

In the above rather theoretical aspect of interaction analysis has been described. Now I would like to introduce practical studies on interaction. Chapelle (1990) suggested that “...if researchers hope to understand what and how particular students learn using CALL material, it is necessary to characterize the interaction that takes place while they work”. Few studies, however, have been conducted to describe interaction during CALL use. There are two studies focused on such interaction of ESL learners, one quantitatively (Hsu, 1994) and the other qualitatively (Park, 1994).

The quantitative study by Hsu (1994) investigated ESL students’ moves on the input, various types of modifications, the relationship between interactional computerized

modifications and their listening comprehension scores, and the relationship between the modification an ESL student requests and her/his improvement on individual words in pre- and post tests.

According to her study, every L2 student demonstrated functional moves that requested dictionary, text reinforcement, or aural repetition types of modifications while working on interactive computer-based listening lessons. L2 students who had lower language competence used one type of modification pattern - aural repetition/text reinforcement/(dictionary), while those who have higher language competence used the text reinforcement/(dictionary) type of modification pattern. L2 students agreed that these interactional computerized modifications helped their listening comprehension. In particular, they viewed the text reinforcement type modifications as the most effective tool for their listening comprehension.

With respect to the frequency of different types of modification, L2 students requested, there was a significant difference between the dictionary and the text reinforcement type modification; also there was a significant differences between the frequency of the dictionary and the aural repetition types of modification. But there was no significant difference in the frequency of the aural repetition and the text reinforcement types of modification. There was a significant positive correlation between the amount of modification L2 students requested and their improved scores. In particular, the text reinforcement type modification was the most effective tool for improving students' listening scores.

This result was consistent with the students' perception as reported on the questionnaire. There was a significant moderately positive correlation between improvement

on individual words and L2 students' use of modification. There was a statistically significant difference between the L2 students' partial dictation re- & posttest scores on both interactive computer-based listening lessons. L2 students had low computer anxiety. L2 students had a positive attitude toward the Active English computer CD-ROM program. Overall her study indicated a positive effect of the multimedia program on the listening comprehension.

Park (1994) investigated the role of interactive multimedia in classroom learning/teaching and individual learning qualitatively, and discusses whether the classroom learning and individual learning using an interactive multimedia program could be connected so that the teacher could facilitate students' independent and responsible learning. Many studies of interactional modifications in classroom settings investigated the interaction between the teacher and the students, where students were passive recipients of input made comprehensible for them by the teachers (Long & Sato, 1983; Pica & Doughty, 1987). However, in Park's study, the interaction was between the learner and the computer, where the learner was responsible for the input they received by seeking comprehensible input through interactional modification. She found the learner's moves which requested modifications (e.g. aural repetition, text reinforcement, or dictionary) of the input they received. The results of the research showed different degrees of learner control of interactional modifications in a computer context and provided a clear direction for future CALL research: Researchers could examine the effects of different CALL texts by looking at student-computer interaction from the perspective of discourse functions: Researchers could examine particular sequences of discourse in CALL texts and relate these results to previous second language classroom research which has investigated the positive effects of particular

sequence of discourses. Two previous studies of interaction showed the importance of interactional modifications. My study also investigates students' interaction and in the speaking activity of my research, a student and a computer interact through speech recognition with a microphone which relies greatly on the recently developed speech recognition technology in the multimedia software. Thus, I will review the technology of speech recognition to understand the potential and current problem of such technology.

### **Speech Recognition Technology in Multimedia Software**

Coniam (1999) explored the potential of the use of voice recognition (VR) technology with second language speakers of English. VR technology is the most recent technology in multimedia. Learners' speaking is used as an input to computer, which enables 'interaction' between learners and computer possible. Automatic speech recognition can give speaking a central role in language instruction (Egan, 1999). Most of current commercial manufacturers claim their product as "speech recognition", but Coniam (1999) pointed out that they should be referred, in fact, as 'voice recognition'.

The study involved the analysis of the output produced by a small group of very competent second language subjects reading a text into the voice recognition software Dragon Systems /Dragon NaturallySpeaking', which is also used in the CD-ROM software 'Smart English' used in my research. As the program is speaker-dependent and has to be trained to recognize each person's voice, subjects first spent about 45 minutes reading a training text of some 3800 words. As the test text, they then read a second text consisting of 1050 words. The output produced by the software was analyzed in terms of words, sub-clausal units, clauses and t-units. In terms of accuracy, the second language speakers' output

on each category of analysis was significantly lower than that achieved by the native speakers. Nonetheless, the results were consistent in line with the native speakers' scores. The paper concluded that VR technology is still at an early stage of development in terms of accuracy and single speaker dependence. Nonetheless, the fact that consistent results have emerged suggests that the development of an assessment tool, such as a reading aloud test via voice recognition technology and determining a score through an analysis of the output, may be a testing procedure with potential. This paper showed that the speech recognition technology is not so perfect as the manufacturers claimed, but can still be useful for language learning with computer. The speaking activity of this research relies on the recently developed speech recognition technology in the multimedia software. The program of this research also shows the typical Korean pronunciation problems. Therefore, in the following literature review, I will introduce the specific Korean pronunciation problems investigated previously.

### **Problems of Korean Learners in Speaking English**

It is not surprising to see that Koreans have difficulties in common in speaking some English sounds correctly (Avery, 1992; Borden, Gerber & Milsark, 1983). Concerning such difficulties Avery (1992) stated as follows:

The pronunciation problems of Korean speakers can be severe because of the radical differences between the sound systems of Koreans and English. Korean has few words with final consonants and lacks both initial and final consonant clusters. Voicing in Koreans is quite different from voicing in English and Korean speakers can have difficulty with the voiced/voiceless distinction (p. 138).

Typical difficulties have been systematically presented in the book by Avery (1992), and the common problems are shortly summarized here.

1. /p/ vs. /f/ and /b/ vs. /v/

Korean does not have the sounds /f/ and /v/, and Koreans speakers tend to substitute /p/ and /b/, respectively.

2. Voicing of fricatives

Korean has no voiced fricatives and Korean learners tend to substitute voiceless stops or affricates for English voiced fricatives. Particular problem is the English /z/ sound in words such as ‘zone’ and ‘zoo’. Korean learners generally pronounce this /z/ sound as /dz/ or /ts/.

3. Voicing of stops

Korean has aspirated voiceless stops and unaspirated voiceless stops but no voiced stops. Thus, Korean learners may have difficulty in perceiving and producing the difference between voiced and voiceless stops in non-initial position.

4. /s/ vs. /ʃ/ vs. aspirated /s/

In Korean, /s/ is pronounced as either /ʃ/ (before high and mid front vowels) or as aspirated /s/ in most other positions. Thus, word such as ‘seat’ and ‘sheet’ may sound the same (like ‘sheet’).

5. /l/ vs. /r/

Korean students tend to substitute /l/ for /r/ in initial position, producing ‘light’ instead of ‘right’. Alternatively, they may substitute what sounds like an /r/ or a flap /D/ for /l/ between vowels, producing ‘firing’ or ‘fighting’ for ‘filing’.

5. /θ/ and /ð/ as in ‘think’ and ‘this’



Korean speakers will usually substitute aspirated /t/ for /θ/ and unaspirated /t/ for /ð/.

#### 6. Affricates

In words ending with affricates, such as ‘match’, Korean speakers tend to insert a short vowel sound, /i/, producing ‘matchi’. The voiced affricate /dz/, as in ‘judge’ is especially problematic. They may pronounce ‘judge’ with what sounds like a final ‘g’ or ‘d’, or may insert a vowel sound at the end of the word.

#### 7. Consonant clusters

Korean students have difficulty with both initial and final consonant clusters. They tend to insert a short /u/ sound between consonants in order to break up the clusters.

#### 8. Tense vs. lax vowels: /iy/ vs. /I/, /ey/ vs. /ɛ/, /uw/ vs. /U/

The distinction between tense and lax vowels does not exist in Korean. Korean speakers usually produce a long vowel sound for the tense vowels and a short vowel sound for the lax vowels.

#### 9. Stress

Korean stress is quite different from English stress, being mainly realized as a higher pitch on the initial syllable of a word or phrase.

#### 10. Rhythm

Korean is a syllable-timed language and thus Korean speakers’ pronunciation of English words and sentences may lack the vowel reduction necessary for English rhythm.

#### 11. Intonation

Korean learners may have difficulty with the characteristic intonation patterns of English because pitch functions differently in Korean.

### **Summary and Approach of This Study**

In the first section, it has been shown that the use of multimedia seems effective in the four important language skills (writing, reading, listening, and speaking). From the reviewed papers of the next two sections, we have learned that ‘interaction’ plays a critical role in SLA and in CALL. The importance of comprehensible input and role of interaction in SLA as well as interaction analysis as a methodology have been reviewed in the second section. It was also noted that interaction must be considered of great importance when choosing or developing multimedia programs for ESL/EFL. Two practical studies on interaction, one quantitatively and the other qualitatively have been reviewed in the fourth section. In the fifth section, it is shown that the speech recognition technology is not so perfect as the manufacturers claimed, but can still be useful for language learning with computer. As described in the introduction section, it would be much more important in the class of ESL in such a country like Korea where a teacher’s ability (or role) is limited in general. Some common problems of Korean learners in speaking English have been described in the sixth section.

Even though the importance of interaction has been recognized for a while through a lot of studies, few studies have been reported about how learners interact with multimedia. My research will focus on this point. Study of the four language skills would be too much for a thesis, so I will make the focus on the speaking and listening skills, in particular, of Korean elementary school children.

### **Research Questions**

The following four research questions will be examined for this study.

1. How do the learners interact with computer in a multimedia speaking activity? How does one learner' interaction differ from another's?
2. How do the learners interact with computer in a listening activity? How much does one learner' interaction differ from another's?
3. How do the students like learning with multimedia?

### CHAPTER 3. METHODOLOGY

In this chapter, the methodology used to examine the research questions will be described.

#### **Interactive English CD-ROM Program**

I tried to select appropriate CD-ROM based programs, based on Carol Chapelle's seven criteria for multimedia CALL (Chapelle, 1998) as described in Chapter 2. I have found four multimedia programs that are available currently in the software market. These are (1) *Smart Start English* by Syracuse Language Systems, Inc., (2) *English Your Way* by Syracuse Language Systems, Inc., (3) *Say it in English* by Knowledge Adventure, and (4) *Learn to Speak English* by the Learning Company. Each program has its own features as well as some in common. *Smart Start English* was selected to use in this research because its contents seemed to fit with the evaluation criteria of multimedia CALL.

According to Chapelle's evaluation criteria, "the linguistic characteristic of target language input need to be made salient" and "learners should receive help in comprehending semantic and syntactic aspects of linguistic input" (Chapelle, 1998). Experimental research has shown that salient input makes learners notice and learn particular syntactic forms and such features as simplification, elaboration, or added redundancy help in comprehending semantic and syntactic aspects of linguistic input. The *Smart Start English* program provided a lot of salient input and helped learners to comprehend linguistic input through whole sentence and segmented sentences repetition, viewing help menus, and pictures. Chapelle (1998) also points out that "learners need to have opportunities to produce target language

output". She explains that it is important that learners produce linguistic output to convey meaning. The program gives learners opportunities to produce target language output. The program, however, didn't allow learners to use the language to construct meanings for communication. Chapelle also points out that "learners need to notice errors in their own output" and "learners need to correct their linguistic output". The program gave opportunities for learners to notice linguistic output and correct their linguistic output in the speaking activity even though it is the limited output in that learners produce pronunciation of a word and learners don't use the language to construct meanings. When learners said one word in the microphone, they got feedback from the computer and they tried to correct their pronunciation. This was a unique feature of the program. The last important thing for the multimedia CALL approach is the use of target language interaction to negotiate meaning. In other words, multimedia CALL should provide normal conversational interaction because when learners communicate with others, they sometimes experience miscommunication at which point they try to modify the interactional structure of conversation or of written discourse which is believed to promote language acquisition. Chapelle suggests that such conversational interaction should require more than the word and sentence level. The *Smart Start English* program didn't meet these criteria fully. However, it was not easy to find programs that support modified interaction of conversation between the young learner and the computer. In conclusion, the *Smart Start English* program was better than other programs even though it didn't meet the seven criteria of multimedia CALL fully.

Table 1. Evaluation of SmartStart English

Principles of Interactionist SLA	SmartStart English Program
1) Learners should notice the linguistic characteristics of the target language input that learners receive need to be noticed.	The <i>Smart Start English</i> program provided a lot of salient input and helped learners to comprehend linguistic input through whole sentence and segmented sentences repetition, viewing help menus, and pictures.
2) Learners need to have opportunities to produce target language output.	In the speaking activity, learners said a word in a microphone and in the listening activity, learners did mouse clicks on the screen.
3) Learners need to notice errors in their output.	In both activities, learners could notice errors from computer's feedback.
4) Learners need to correct their linguistic output.	Learners tried to correct their output.
5) Learners need to engage in target language interaction whose structure can be modified as needed for comprehension.	Learners could not engage in normal conversational interaction.

I have selected two activities in *Smart Start English*, one for speaking and the other for listening practice to use in my research. The speaking activity was a Bingo game. When it starts, a student can see a 5×5 matrix of a food chart on the screen. The speaker from the software program describes a food and then asks what it is. For example, the computer says,

Sentence A: "You peel it".

Sentence B: "It's soft".

Sentence C: "It grows on a tree".

Question: "What is it? Peas or bananas?"

Then a microphone icon appears on the screen and the student has to respond, saying one of the two words to the computer using a microphone. If the student pronounces the word

correctly, the program sounds 'bink' and gives a feedback to the student such as "Yes, it is banana". If the answer is wrong, or the student pronounces the word incorrectly, the computer sounds 'bonk' and the microphone icon reappears on the screen to make the student keep trying until s/he sounds it correctly or s/he gives up. While a student is playing this game, s/he can click an icon to hear the whole sentence and the question again, or choose to hear each of the sentences as many times as s/he wants. There are also helping menus to teach the student about the key vocabulary of each sentence such as 'peel', 'soft', or 'grows on a tree', respectively. When s/he clicks the corresponding icon, a 2x3 matrix of boxes appears on the screen. Every box has a picture related to the key word. When the student clicks on any of the pictures, the computer says a sentence containing the key word that is related to the picture. This way, the student can learn the meaning of the keyword. After this, s/he can return back to the bingo game. When a student matches pictures vertically, horizontally, or diagonally, the game is finished. Since the software was programmed to do the game differently each time, individual students spent different amounts of time in finishing the Bingo game. Individual students also had a different number of questions ranging from 10 to 18.

The listening activity required learners to look for a person who the software program described and then asked them to find on the screen. Every student had to find 12 people in total, one by one. The student listened to a sentence and three descriptions (A, B and C), followed by a short question. For example,

"I am looking for my nephew."

A: "He is wearing glasses."

B: "He is thin."

C: "He has straight hair."

"Who is it?"

Given the description, the student should be able to identify and click the right person on the screen. When it is right, the program gives positive feedback such as "That's fine.", "That's right.", "Very good!", "Good job!", or "Correct!" When they click the wrong person, the program also gives feedback but a negative one such as "Sorry, try again.", "Sorry, keep trying.", "Bad luck, try again.", or "No, that's not correct." While a student is doing this game, s/he can click an icon to hear the whole sentence and the question again, or choose to hear each of the three descriptions as many times as s/he wants. There are also helping menus to teach the student about a key vocabulary of each description such as 'glasses', 'thin', or 'straight hair', respectively. When s/he clicks the corresponding icon, a 2×3 matrix of boxes appears on the screen. Every box has a picture related to the key word. When the student clicks on any of the pictures, then the computer says a sentence containing the key word related to the picture. This way, the student can learn the meaning of the key words. After this, s/he can return to the main game.

### **Subjects**

The subjects of the study were non-native English speaking students. All are Korean elementary school children who recently arrived in the U.S. or have lived in the U.S. for less than eighteen months. There were a total of nine students (5 males and 4 females) from 2<sup>nd</sup> to 6<sup>th</sup> grade. Seven students are presently enrolled in a ESL class. Two have private tutors instead of ESL class because their school, Sawyer elementary school, closed the ESL class recently. At the beginning of the research project, the object of the study was explained to



the students and their parents. The video taping of the activities was permitted by parents in writing (Appendix B). To obtain an initial needs analysis, the researcher asked students about their computer experience. It was discovered that most of the participants have experienced various multimedia programs from some games to subject learning programs of various kinds such as mathematics or history in the past, but none has any experience using it as an English learning tool. The name (pseudonym), grade, gender, and the amount of duration of time the students have been in the US are summarized in Table 2.

Table 2. Personal information of the students employed in this research

Student (Name)	A (Jun)	B (Sul)	C (Sung)	D (Min)	E (Jung)	F (Hyun)	G (Sun)	H (Hee)	I (Yun)
Grade	2	5	5	4	6	5	3	3	3
Gender	M	F	M	M	F	M	M	F	F
Periods in the US (months)	6	6	6	6	6	18	6	6	18

### Instruments

Two activities, speaking and listening, and a questionnaire were used in this study. The CD-ROM programs for the activities were installed on a notebook computer. All class sessions were videotaped for later analysis of interaction. The questionnaire (Appendix C) was given to students to assess the participants' attitude about learning English and the extent of achievement or satisfaction after completing the multimedia activities. First, I asked 7 questions right after the activities, but later I wanted to add more. I started all over and asked them to respond to 10 statements on the phone. The second time, I asked questions in Korean. Each student completed the ten items ten items below. Each item used

the following five-point Likert scales; 5=strongly agree or positive, 4=agree or positive, 3=undecided, 2=disagree or negative, and 1=strongly disagree or negative.

### **Questionnaire**

1. I like English.
2. Learning English is very important.
3. I like using computers.
4. I like the listening activity in this program.
5. My listening skill will be improved by this kind of activity.
6. I like the speaking activity in this program.
7. I was comfortable when I spoke with a microphone in the activity.
8. The computer recognized my speaking properly.
9. My speaking skill will be improved by this kind of activity.
10. I was able to concentrate on the activity more than you are in English class with a teacher.

The first two items on the questionnaire were to assess the learners' attitude toward studying English in general, and the third item was to assess learners' comfort toward using computers. Items 4 and 5 were to assess their attitude toward and feelings about the listening activities of the multimedia program, while items 6 to 9 assessed their attitude toward speaking activity. The last item was used to assess the activities overall.

### **Procedure**

The study was conducted over a period of three weeks in the spring of 2000. The proposal for this research was reviewed and approved by the Iowa State University Human Subjects Committee (Appendix A). The subjects of my study were the children of my personal acquaintances. I had taught five of the nine students in my Practicum course (After school English program in Edwards elementary school for twice a week for 4 weeks) in the fall of 1999. Thus I knew the background of their English abilities. This background knowledge played a helpful role in starting the experimental study. From Jan. 27<sup>th</sup> to Feb. 7<sup>th</sup>, I invited one student at a time to my home. To prohibit a possible novelty effect due to unfamiliarity with CD-ROM, each student and I worked with the program together for about thirty to forty minutes with other speaking and listening activities in the program. I had let each student explore every detail of the CD-ROM program. While we were working together, I modeled what to do and let them try the voice recognition activity until they felt comfortable with the program. Then they started the activities. At this step, I tried not to participate in the activity. No time limit was given to students to complete activities. As each student worked on the multimedia program, the entire process of the activity was recorded by a video camera. Individual students spent different amounts of time in working on the speaking and the listening activities. After they finished these activities, I gave each student a questionnaire. All the activities and the answers to the questionnaire were analyzed according to the research questions.

### **Data Analysis**

The first research question was stated as follows: How do the learners interact with computer in a speaking activity? How does one learner's interaction differ from another's? The data obtained from the video recording on students' speaking activities were analyzed by counting the frequency of speaking trials, hearing repetition, viewing help menus, using the give up key menu, and time spent. First, I categorized the items by their icons which represented tasks such as whole question repetition, segmented question repetition, viewing help menus, give up key menu, speaking trials, and hearing two answer keys. While watching the video recording repeatedly, I counted students' clicking and speaking trials in my notebook. This process was repeated for each question for each student. Then, using Microsoft word, I made tables for each question into which I entered the collected data. At this step, I couldn't see the whole picture because it was very difficult to analyze results when looking at more than 50 pages of tables. To make my data more accessible, I made tables which showed 9 students' results at one glance for each question. The resulting tables were helpful for me to analyze the results because I could see each student's common characters and different styles and so on within one table for each question.

The second research question was stated as follows: How do the learners interact with computer in a listening activity? And how does one learner's interaction differ from another's? The data obtained from the video recording on students' listening activity was analyzed in terms of hearing repetition, viewing help menus, and time spent. The whole procedure for making data of listening activity was the same as the speaking activity.

The third research question was stated as follows: How do the students like learning with multimedia? The data obtained from the questionnaire were analyzed in terms of the

students' attitude to learning English and to using the multimedia programs. Each item used a following five-point Likert scale: 5=strongly agree or positive, 4=agree or positive, 3=undecided, 2=disagree or negative, and 1=strongly disagree or negative. With those scores, I made tables and got descriptive statistics such as mean scores and standard deviations so that I could compare one student's score with another's.

## CHAPTER 4. RESULTS AND DISCUSSION

The results relating to each of the research questions in Chapter 2 are analyzed, summarized and discussed in this chapter.

### Research Question One

My research question one was stated as follows: How do the learners interact with the computer in a speaking activity? How does one learner's interaction differ from another's?

Details of the quantitative results are summarized in Appendix D for the whole speaking activity for all students. The example of the results for one question is shown in Table 3 for further explanation. The following items are included: the question to students, number of whole sentences repeated, number of additional hearing of segmented sentences and their viewing of help menus, amount of additional hearing of key words, speaking trials, and total time used for one question.

The activity was a 'bingo' game, and it was programmed so that each student had one of several different problem sets, chosen by the computer randomly. All students had not all the same questions, or equal number of problems. For this reason, only eight students' results are shown in Table 3 (Student G is absent), as not all nine students had the same number of questions. For the same reason, most of the tables in Appendix D have some empty columns. Each problem in the Bingo game consisted of three sentences (A, B, and C) followed by a short question. An example of a problem is shown below:

- A. You peel it  
 B. It's soft.  
 C. It grows on a tree.

What is it? Peas or **banana**?

Table 3. Summary of the speaking activity for question 1

Student	A (Jun)	B (Sul)	C (Sung)	D (Min)	E (Jung)	F (Hyun)	G (Sun)	H (Hee)	I (Yun)
# of whole question repeated	2	3	0	0	0	0		1	1
# of additional hearing (viewing help menu)									
Sentence A	1(1)	1(1)	0(1)	0(1)	0(0)	0(0)		0(0)	1(0)
Sentence B	1(1)	1(2)	0(0)	0(1)	0(0)	0(0)		0(0)	1(0)
Sentence C	0(0)	2(2)	0(1)	0(1)	0(0)	0(0)		0(0)	1(1)
# of additional hearing (speaking trials)									
Peas	2(2)	2(2)	5(1)	1(0)	0(0)	1(2)		1(0)	2(11)
<b>Banana</b>	2(3 <sup>*</sup> )	8(32)	4(1)	0(3)	1(4)	7(25)		13(15 <sup>*</sup> )	2(6 <sup>*</sup> )
Total time used (min : sec)	2:59	3:14	1:29	1:07	0:22	1:32		1:28	2:07

Table 3 shows a summary of the results of the Bingo activity for the above question. The correct answer, 'banana' is shown in bold font to make analysis easier. The three sentences, A, B, & C describe one of two foods that the program will ask the student to choose from the screen. When a student misses hearing the descriptions, does not understand them, or just wants to make sure, s/he can click either or both of the two answer choices in

this program: first, to listen to the whole sentences including the short question again, or second, to listen to one or more of the segmented sentences of a question.

The second row, ‘# of whole question repeated’, shows how many times each student listened to the whole sentence. For example, Student A and C repeated two times and no times, respectively. That is, they listened to the sentences three times and only one time, respectively, in total.

The next four rows, ‘# of additional hearing (viewing help menu)’ and below, show the numbers of additional hearing of each sentence of A, B or C, as well as the numbers in parentheses representing the number of trials to get a viewing help menu for each sentence.

The viewing menu helps the student to understand the meaning of the sentence by showing examples of three similar and three opposite things. The next three rows, ‘# of additional hearing (speaking trials)’ and below, show the number of additional hearing of the words for answer. The numbers in parentheses are the numbers of speaking trials until s/he got a correct answer and pronunciation/accent. Sometimes a student was not able to get a correct pronunciation and accent (by the computer’s standard) even after many times trials, at which time the student clicked the ‘give-up’ key to stop. In this case an asterisk (\*) is shown after the number in the parentheses. The last line shows the total time (minutes and seconds) spent to finish the problem.

Since no time limit and no specific procedural instruction were given to students for the activities, each student had enough time to complete the activities in his/her own pace. It was quite interesting to find that each student showed his/her own style to solve the problems, though there were a lot of common characteristics as well. These will be described first.



Most frequently learners chose to listen to the whole sentences and question first when they wanted to hear any sentence again. Hearing of the segmented sentence was chosen rarely. Even when it was chosen, it was after the whole sentences were repeated first. Thus most of the corresponding three rows in Table 3 and Tables in Appendix D are zeros. Viewing help menus can be regarded as an act of resourcing that can be defined as a cognitive strategy (Chapelle, Jamieson & Park, 1996). The viewing help menus were also not used very often by most students. This result is consistent with the previous results of interaction analysis that learners did little resourcing despite the availability of the option (Chapelle, Jamieson & Park, 1996).

A quick glimpse of Table 3 clearly shows clearly a large variation between participants in the time spent for solving the same problem. For example, Student B spent 3 minutes 14 seconds on the problem, while Student E spent only 22 seconds. This is because student E was successful in giving a correct pronunciation/accents just after 4 times, while the student B was not able to do this until the 32nd attempt. Because Student B could not produce the correct sound easily, she heard the word 8 times additionally, which took a lot more time.

There is also a noticeable difference in students' persistence (style) when they had trouble. For example, Student A gave up only after trying three times, while Student H gave up after fifteen times. Student B and F tried a lot more times (32 and 25 times, respectively) to complete their task successfully. These students' persistent characteristic was consistently observed in other questions (7<sup>th</sup>, 13<sup>th</sup> or 16<sup>th</sup> tables in Appendix D), where a student tried a word 35, 58, or 37 times, respectively. Student F showed similar characteristics in other questions.

Some results for the speaking activity are summarized in Tables 4-6, which show total time spent, number of total questions asked, number of words given-up, and list of words given-up by each student even after many times of unsuccessful trials to speak correctly.

As you can see in Table 5, all students were quite successful in completing this Bingo game. Student A and student I used the 'give-up key' six times for the speaking activity questions 11 and 14, respectively, but the other seven students used 'give-up key' just 3 times or less on the same question. In many cases, the students didn't always need to repeat the words so many times to get a correct answer. As you can also see in Table 5, when students pronounced some of words such as 'tomato', 'milk', 'water', 'hot chocolate', 'cake', 'soup' and 'apple', almost all students pronounced them correctly within fewer than 10 attempts. In particular, all four students who were prompted to pronounce 'milk', said the word correctly in one attempt. When students attempted to pronounce 'hot chocolate', all six students pronounced it correctly the first time.

It is also clear that most of (7 out of 9) students spent about 52 ( $\pm 15$ ) seconds for solving each problem (Table 6). Student B and Student G are two extreme examples in this experiment, with Student B taking 1 min 21 sec (the longest time) and Student G taking 0 min 21 sec (the shortest time), to complete the task, respectively. Student B and Student G came to the US almost at the same time, and are a 5<sup>th</sup> and a 3<sup>rd</sup> graders, respectively. As noted earlier, Student B(Sul) was very persistent, but seemingly had more difficulty in English-pronunciation. She tried a word (rice) 58 times before giving up. She used whole question repetition, viewing help menus, additional hearing of phrases and words many times. Student G(Sun) had the least trouble with pronunciation and, gave up only one word,

after trying it 35 times. He didn't use additional hearing or help menus much. As mentioned earlier, Student A has an attitude of giving-up most easily. He has given-up 6 words out of 11, trying 12 times as a maximum. This might be because he is the youngest one of this experimental set (Table 2), but the results of one-grade older ones (Student G(Sun), H(Hee) and I(Yun)) suggested this is more likely from his character.

In some cases, after students repeated the words so many times, and still heard the 'bonk' sound, they looked disappointed. In particular, 'fish', 'rice', and 'orange juice' made students very disappointed when they could not get the correct answer and so they spent much time repeating those words. Students couldn't understand what the problems were because the program didn't tell them anything but the 'bonk' sound. Some of the students used good strategies to correct their pronunciation. Student H(Hee), for example, clicked additional hearing keys to hear the pronunciation of a word more times. While she spoke the word 'banana' 15 times, she heard native speaker's voice 13 times. While she spoke the word 'fish' 17 times, she heard a native speaker's voice 15 times. Also in pronouncing 'orange juice' 24 times, she heard the word 21 times. In pronouncing 'rice' 28 times, she heard the word 22 times. While pronouncing 'peas' 25 times, she heard the word 20 times. With the word 'ice cream', she pronounced the word 23 times and heard it 21 times. By hearing the computer's input again and again, she tried to correct her speaking. However, unfortunately with all of the words, she was not successful in producing the word correctly.

While watching Student H, I myself was not sure why she was wrong. As a non-native speaker, I could not notice which part of the words was phonetically wrong. To my ear, at least, banana and peas were correct even though with my previous knowledge of phonology, I knew Koreans have some problems with words such as rice, orange juice, fish

and so on. Thus, I wondered if this activity would help her speaking very much because even though she tried hard, she still could not meet the computer's standard. However, this speaking activity gave Student H some opportunities to notice which words she has more problems with and which words she has the least problems.

In the other cases, student B(Sul) was successful in saying 'banana' after she tried it 32 times. She also heard the word 8 times. She succeeded in speaking 'spaghetti' after she tried it seven times and heard it four times. She was successful in speaking 'carrot' after she tried it and heard it three times. Student F(Hyun) was successful in speaking 'banana' after he tried it 15 times and he heard it 13 times. He also was successful in speaking 'potatoes', 'cake', 'coffee', and 'grapes' after he tried it seven, five, five and four times respectively. When they finally got answers right after they tried them repeatedly, they seemed very pleased. Some of students raised their hands, saying 'yeah', showing a pleasure upon completing a task. I think in particular that Student B and Student F were encouraged very much when their efforts were successful.

According to the numbers of speaking trials and words given up shown in Table 4, we can see which words are the easiest and which are the most difficult for Korean young learners to say correctly. The easiest words that most students succeeded at with one trial were 'milk', 'tomato', 'water', 'hot chocolate', 'soup', and 'apple'. For these words, the students didn't need to repeat, but they had to say the most difficult words again and again until they pronounced them correctly. The most problematic words that most of students failed to speak correctly were 'fish', 'orange juice', and 'rice'. When they had to say 'fish', seven out of eight failed to pronounce it correctly. For 'orange juice', five out of six failed. For 'rice', all four students who had this question failed. The next most difficult words for

these Korean students were 'hamburger', 'peas', and 'banana'. When students pronounced these, three out of six, two out of four, and three out of eight failed, respectively.

As is shown in Table 5, most students tried to say the more difficult words correctly a lot of times. Even though they were not successful in some cases, you can notice how hard they tried without giving up quickly. In other cases, they had a lot of success in pronouncing the words correctly after only a few attempts. Students A(Jun), for example, got the correct answer when he pronounced water after trying 5 times. Student B(Sul) got the correct answer after she pronounced banana 32 times, and spaghetti 7 times. Other examples of number of attempts versus success rates are found in Table 4. After they tried hard and got the positive feedback 'bink' sound showing they were right, they were very happy and pleased.

It seems apparent that students got some idea of how to pronounce target words after they tried to successfully complete the questions many times. I think these kinds of speaking trials will give the students opportunities to produce the foreign language and to get feedback from the computer even though the program didn't identify what their specific problems are or what they need to correct to complete the task successfully.

The words given-up listed in Table 4 shows clearly that these are related to the well-known specific pronunciation problems of Koreans reported in the previous research. According to Avery (1992), Koreans have the pronunciation problems in /f/ and /v/, /l/ and /r/, /dg/, /z/, and /ts/. As you can see the words given up, the students had difficulty in pronouncing such words as fish, rice, or orange juice.

Therefore, from this activity, students had a lot of opportunities to notice and to correct their errors. It seems that these speaking trials and feedback are valuable and helpful

for Korean young learners who need to have opportunities to have interaction although it seems it would be more helpful if the software program gave more detailed feedback to students like face to face interaction with native speakers and the program provided normal conversation instead of 'bink' and 'bonk' sound.

Table 4. Number of total questions and words given-up

	A	B	C	D	E	F	G	H	I
	(Jun)	(Sul)	(Sung)	(Min)	(Jung)	(Hyun)	(Sun)	(Hee)	(Yun)
# of total Questions	11	16	13	14	12	15	10	18	14
# of words given up	6	3	3	3	2	2	1	6	5

Table 5. Words asked to speak and number of speaking trials

	Words asked to speak (# of speaking trials)
A (Jun)	Cake(1), coffee(4), hot chocolate(1), milk(1) water(5), <b>Banana(3), cheese(6) , fish(11), orange juice(11), soda(12), tomato(11)</b>
B (Sul)	Cake(1), hot chocolate(1), water(1), Banana(32), cheese(1), tomato(1), Potato(2), spaghetti(7), pizza(1), soup(1), peas(1), carrot(3), bread(1), <b>fish(35), rice(58), Hamburger(37)</b>
C (Sung)	Banana(1), cake(2), carrot(9), coffee(1), hot chocolate(1), milk(1), orange(7), potatoes(1), soup(1), water(1)

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	<b>Fish(16), grapes(18), orange juice(35)</b>
D (Min)	Banana(3), carrot(4), hamburger(4), hot chocolate(1), ice cream(12), milk(1), orange(2), pizza(6), potatoes(14), tomato(1), water(1)
	<b>Fish(37), orange juice(16), spaghetti(23)</b>
E (Jung)	Banana(4), bread(2), cheese(7), fish(7), grapes(1), pizza(1), potatoes(1), soup(6), tomato(1), water(1)
	<b>Hamburger(23), peas(52)</b>
F (Hyun)	Banana(25), cake(5), carrot(1), cheese(1), coffee(5), grapes(4), potatoes(7), soup(1), spaghetti(1), water(1), orange(5), apple(1), ice cream(33),
	<b>Fish(21), orange juice(45)</b>
G (Sun)	Apple(1), carrot(6), cheese(16), coffee(6), hamburger(10), orange juice(30), peas(1), soda(6), spaghetti(9),
	<b>Rice(35)</b>
H (Hee)	Apple(1), cake(4), carrot(3), cheese(5), hot chocolate(1), hamburger(8), orange(4), soda(12), soup(1), tomato(2), water(1)
	<b>Banana(15), fish(17), ice cream(23), orange juice(24), peas(25), rice(28)</b>
I (Yun)	Apple(1), cake(2), carrot(1), cheese(3), hot chocolate(1), orange(1), spaghetti(1), tomato(10), water(2),
	<b>banana(11), bread(41), fish(41), hamburger(21), rice(32)</b>

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Table 5: Continued.

\* The words that were given up by the student after several times trials in the speaking activity are shown in bold font. The trial numbers are shown in parentheses.

Table 6. Average and total time used in the speaking activity

	A	B	C	D	E	F	G	H	I
	(Jun)	(Sul)	(Sung)	(Min)	(Jung)	(Hyun)	(Sun)	(Hee)	(Yun)
Average time	0:53	<b>1:21</b>	1:07	0:58	0:41	0:48	<b>0:21</b>	0:44	0:57
Total Time	9:51	<b>21:29</b>	14:32	13:38	8:08	12:06	<b>3:34</b>	13:20	13:20



### Research Question Two

My second research question was stated as follows: How do the learners interact with the computer in a listening activity? And how does one learners' interaction differ from another's?

Details of the quantitative results are summarized in Appendix E for the whole listening activity for all students. One example of the results is shown in Table 7 which contains the questions to students and numbers of whole questions repeated, number of requests to hear each sentence A, B or C and their help menus, and total time used for each question for all nine learners.

The listening activity presents the same 12 questions to every student. Only the order is different, chosen by the computer randomly. Thus the tables in Appendix E have all the columns filled, unlike the speaking activity. Each problem consists of a sentence and three statements (A, B and C) followed by a short question as follows:

Question 5:

I'm looking for my brother.

A. He is *thin*.

B. He has *blond hair*.

C. He wears *blue*.

Who is it?

The three statements describe the person mentioned in the first sentence. When a student missed hearing the descriptions, did not understand them, or just wanted to make sure, s/he had two choices in this program: to listen to the whole three sentences including the short question again, or, to listen to one or more of the individual sentences. The second row, '# of

whole question repeated', shows how many times each student have listened to the whole sentences. For example, Student B(Sul) and C(Sung) repeated one time and no times, respectively. That is, they listened to them two times and only one time, respectively, in total. The next four rows, '# of additional hearing (viewing help menu)' and below, show the numbers of requests to hear of each sentence of A, B or C, as well as the numbers in parentheses representing the number of trials to view the help menu for each sentence. The viewing menu helps the student to understand the meaning of the key word of the sentence by showing examples of three similar and three opposite things. The key words are italicized in the sentences. The last line shows the total time (minutes and seconds) spent to finish the problem.

Table 7. Summary of the listening activity for question 5

Student	A	B	C	D	E	F	G	H	I
	(Jun)	(Sul)	(Sung)	(Min)	(Jung)	(Hyun)	(Sun)	(Hee)	(Yun)
# of whole question repeated	1	1	0	0	0	0	0	1	0
# of additional hearing (viewing help menu)									
Sentence A	0(0)	2(1)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
Sentence B	0(0)	1(1)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
Sentence C	0(0)	1(1)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
Total time used (min : sec)	0:20	1:55	0:32	0:11	0:09	0:11	0:11	0:18	0:14

The listening activity is more passive than the speaking activity in this program. The input to computer by a student is only clicking on the screen, in contrast the speaking activity had the additional feature of having learners give input through a microphone. The listening

activity in this experiment is simpler and has fewer tools that 'interact' with computer than the speaking activity. Less difference was observed in the individual's interaction in the listening activity than the speaking one. Nevertheless, the fact that there was no time limit allowed each student to finish the activity at his/her own pace. As a result, the difference in each individual's time to finish the problem is similar to what was found in the speaking activity.

In the listening task, most of the learners chose first to listen to the complete sentences and questions when they needed repetition for clarification. Choosing to hear only the individual was rare: this occurred only for 5 questions in total of 108 (= 9 students times 12 questions) questions, as can be seen in Tables in Appendix F. As you can see from Table 7, Student C(Sung) is the case. Usually when this option was chosen, it was only after the whole sentences were repeated first. For example, Student B(Sul) repeatedly listened to Sentences A, B and C, but only after she repeated the whole dialogue one time. Thus most of the corresponding three rows in Table 7 and Tables in Appendix E are zeros. The help menus were also not used often by many of the students.

A quick glimpse of Table 7 shows the difference between learners in regards to the time spent for the same problem. For example, Student B(Sul) spent 1 minute 55 seconds, while Student E(Jung) spent only 9 seconds. While this could be an extreme example, it shows the difference between learners. Student B used all the functions in the program, while Student E(Jung) just went for the answer and took much a shorter time. A similar example was observed in the speaking activity for the same two students as previously shown in Table 3, where it was less clear to decide if it is because of pronunciation or personal learning styles. But in this listening activity, it became clear that the two students have

differences in learning style at least with multimedia learning. Student B(Sul) seems to explore as many functions in the program as possible, while Student E(Jung) seems to want to find the answer of the given problem directly. However, in the listening activity, all students except student E used much shorter time than the speaking activity and didn't explore menu options very much. From this data, it was not easy to determine that student E was quite different from the other learners with the exception of student B.

Overall results for the listening activity are summarized in Table 8, where total time, total questions, average time per question, numbers of whole question repeated, of segmented sentences repeated, and their help menus are presented.

Table 8. Summary of the whole listening activity

Student	Total time Used	Average time per question *	# of whole question repeated	# of segmented question repeated	# of viewing help menu
A(Jun)	3:30	0:18	5	0	0
B(Sul)	<b>14:12</b>	1:11	13	34	22
C(Sung)	6:10	0:31	5	11	5
D(Min)	5:50	0:26	5	2	9
E(Jung)	3:30	0:18	3	3	1
F(Hyun)	<b>3:07</b>	0:16	4	0	0
G(Sun)	3:34	0:18	2	1	6
H(Hee)	3:43	0:19	6	0	0
I(Yun)	<b>2:50</b>	0:14	0	2	1

\*There were 12 questions given to each student.

As shown in Table 8, it is clear that most (6 out of 9) students spent about 3~4 minutes to complete the whole activity, Student C(Sung) and D(Min) took a little longer. But Student B(Sul) took much longer. Every student used at least one request for repetition. Student I(Yun) chose to use such a repetition the least. She used additional hearing of sentences two times and viewing help menu only one time during the whole activity, spending the shortest time to complete the task. This is drastically different from Student B who used them 34 and 22 times, respectively, as well as whole sentences repetition 13 times. It is also noted that Student F(Hyun) used only repetition of whole sentences. If the activity is to be considered a game, students such as F(Hyun) or I(Yun) are the best players for they completed the task quickly and used the least amount of aid. However, they were the least interactive learners. We might find the reason from their longer stay in the US, and they are more accustomed to spoken English in comparison with the others.

### Research Question Three

The third research question was stated as follows: How do the students like learning with multimedia? To assess students' attitude toward learning English with a multimedia program, I asked each student to react to 10 statements over the phone. These are listed in Appendix C. Table 9 summaries minimum, maximum, mean scores and standard deviation of 10 statements.

Table 9. Summary of questionnaire

Item	Minimum	Maximum	Mean (std.dev.)
1. Studying English	3	5	4.0(0.9)
2. Importance of English	4	5	4.7(0.5)
3. Using Computers	3	5	3.9(0.6)
4. Listening activity	3	5	3.9(0.6)
5. Improvement of their listening	3	5	4.2(0.7)
6. Speaking activity	2	5	3.7(1.2)
7. Microphone	2	5	3.3(1.0)
8. Recognition of their voice	1	4	3.0(0.9)
9. Improvement of their speaking	3	5	4.0(0.7)
10. Concentration	3	5	4.0(0.7)

The first two items on the questionnaire were used to assess the learners' attitude toward studying English in general, and the third item was toward using computers. Items 4 and 5 were used to assess their attitude toward and feelings about the listening activities of the multimedia program, while items 6 to 9 were for the speaking activity. The last item was to assess the activities overall.

Data from item 1 showed the range of scores from 3 to 5, and the mean (s.d.) of 4.0(0.9), indicating that generally students like studying English: Three students were undecided about this question, while the other three like it very much. They all think studying English is important with the range from 4 to 5 with the mean 4.7(0.5). This data is consistent with the general attitude observed in Korea. In Korea, English is regarded one of the most important subjects to pass entrance exam and to go to higher college. Their attitude toward using computers was also positive

For item 4, the assessment of the listening activity, the range of scores was 3 to 5 with the mean 3.9(0.6), indicating that they liked the listening activity in the multimedia program in general. With item 5, the range of scores was 3 to 5 with the mean 4.2(0.7). Only one student had a score of 3 and all the others were positive or very positive about the usefulness of the activity as a tool for improving their listening skills with this program.

It is interesting to see from the data for item 6 of the speaking activity, with a range from 2 to 5 with the mean 3.7(1.2), that four out of nine students were undecided or disagree that the speaking activity could be helpful for improving their speaking skill. The average is not so different from that for the listening activity (item 4), but the range is much wider. This

fact seems to be related with the microphone issue as shown in the data for the item 7 of whether they feel comfortable with using a microphone, the range of scores was 2 to 5 with mean of 3.3(1.0). Five students out of nine were undecided or negative about using the microphone. I think this is related to the issue that the current voice (or speech) recognition technology used in the program needs to be developed further. It becomes obvious from the data for the item 8, the range of scores from 1 to 4 with the mean of 3.0(0.9), that most students thought the computer did not recognize their speech patterns properly. It was the lowest score in the questionnaire. Nevertheless, based on item 7 they thought the speaking activity would improve their speaking skills from the item 9, the range of scores from 3 to 5 with the mean of 4.0(0.7). Finally according the data for item 10, they thought that generally the program helped them to concentrate on the activities.

Table 10. Results of questionnaire (10 items) asked to each student

5=strongly agree or positive, 4=agree or positive, 3=undecided,  
2=disagree or negative, and 1=strongly disagree or negative.

	A	B	C	D	E	F	G	H	I
1. Studying English	5	3	3	3	5	4	4	5	4
2. Importance of English	4	5	5	5	5	5	4	5	4
3. Using computers	5	3	4	4	4	4	3	4	4
4. Listening activity	4	4	3	4	4	3	4	5	4
5. Improvement of their listening	4	5	4	5	4	3	4	5	4
6. Speaking activity	3	4	5	5	3	2	5	4	2
7. Microphone	4	3	4	4	3	2	2	5	3
8. Recognition of their voice	4	3	3	3	3	1	3	3	4
9. Improvement of their speaking	3	4	4	5	4	3	4	5	4
10. Concentration	4	5	4	4	4	3	3	5	4



### Summary

When Korean elementary students worked on the speaking activity, they preferred clicking on the whole question repetition prior to using the other helping menus. Individual students spent different amounts of time to solve questions depending on their achievement in the speaking activity. There was also a noticeable difference in students' persistence (or style) when they had a problem. Some students gave up quickly when trying to correct their pronunciation, and others didn't. For example, to pronounce 'banana', Student A tried it only three times and gave up. Students B and F tried it 32 times and 25 times, respectively, to get it right. For some difficult words, students had to try them many times, but for some easy words, they didn't need to try them many times. Most of the students used give up menus because they couldn't meet the computer's standard. Some students used good strategies to correct their pronunciations. For example, after they heard the 'bonk' sound, they tried to listen to a native speaker's pronunciation carefully first and then they tried to follow it.

According to Avery (1992), Koreans have the pronunciation problems in /f/, and /v/, /l/ and /r/, /dg/, / z/, and /ts/. From the data collected from the speaking activity, we can also see common pronunciation problems of the Korean learners. These can be seen from the words given-up in Table 4. The easier words that Koreans easily pronounce were 'milk', 'tomato', 'water', 'hot chocolate', 'soup', 'cake' and 'apple'. The most problematic words were 'fish', 'orange juice', and 'rice'. The results of these activities were consistent to studies of previous researchers. Many students used this program effectively to correct their pronunciation especially when they didn't give up quickly. To pronounce the word correctly,

they tried to speak many times and finally they could meet the standard of the program. They were very glad when they could finally pronounce the word correctly.

In the listening activity, most of the learners first chose to listen to the whole sentences and a question when they wanted to hear any sentence again. The data of the listening activity shows a large difference in the time spent for the same problem. For example, student B spent 1 minute and 55 seconds, while student E spent only 9 seconds for question 5. Student B explored all the available options in the program, while student E just went for the answer taking much shorter time. In the listening activity, it became much clearer that the two students have clear difference in learning styles at least with this multimedia program. Student B seems to explore as many options in the program as possible, while student E seems to want to find the answer of the given problem directly. This character was consistently observed in other questions seen in Tables in Appendix E. As shown in Table 5, it is also clear that most of the students (6 out of 9) spent about 3~4 minutes for the whole activity, but Students C and D took longer. Student B, however, took much longer. Students F and I rarely used the option keys and therefore, they were the least interactive learners. This might be because of their longer stay in the US, and they are more accustomed to hearing spoken English compared to the others.

Students' attitudes toward learning English indicated that in general students like studying English. However, all students fairly agreed that studying English is very important with the range of scores from 4 to 5 with the mean 4.7 and standard deviation 0.5. Students liked the listening activity in the multimedia program in general and they also thought the listening activity would improve their listening skill. In the speaking activity, four out of nine students were undecided or disagreed that the speaking activity could be helpful for

improving their speaking skill. Five students out of nine were undecided or negative about using the microphone. Most of the students thought that the computer did not recognize their speaking properly, which was represented as the lowest score in the questionnaire. Nevertheless, according to item 9, the speaking activity would improve their speaking skills, the range of scores from 3 to 5 with the mean of 4.0 and standard deviation of 0.7. In general, they thought the program helped them to concentrate on the activities while they were doing them.

## CHAPTER 5. CONCLUSION

In the previous chapter, the results of the study were presented as they are related to the research questions of the study. Next, the conclusion and suggestions for the future research will be presented.

The main purpose of this research was to investigate how young Korean students interact with a multimedia CALL program when learning spoken English. The current environment of Korean English classroom is regarded as not giving students enough opportunities to have a lot of comprehensible input, comprehensible output and interaction in spoken English. According to Krashen's input hypothesis (1985), when learners receive comprehensible input that includes unknown linguistic materials at their ability level or a little beyond their ability level, they acquire the language. Long (1985), Allwright and Bailey (1991), and Pica (1994) also pointed out that asking questions, indicating confusion, or requesting clarification or repetition made by a non-native speaker during conversation to understand the input help to acquire the language. The results of this research of speaking and listening activities showed that students can interact with a multimedia CALL program through various interactional modifications such as whole question repetition, segmented sentences repetition, their viewing help menus and saying (repeating) a word with a microphone. Thus, it seems obvious that such multimedia CD-ROM programs can be used effectively for assisting second language or foreign language students to have linguistic and non-linguistic interaction with a computer when learning spoken English. In other words, through icons and mouse clicks, or speaking with a microphone, multimedia CD-ROM programs provide opportunities to have interaction.

In the speaking activity, students could have comprehensible input and interactional modifications through mouse clicks on whole question repetition, segmented sentences repetition, and elaboration on meaning such as viewing examples, and output through speaking the language with a microphone. This activity provided comprehensible input, but limited output. Students could produce output, saying English words in the microphone, and they corrected their pronunciation after hearing feedback from the computer. In the activity, the computer's feedback was 'bink' or 'bonk' sounds which mean that a student's pronunciation was right or wrong. Those sounds made learners to try to correct their output, but the program didn't tell exactly which part they should correct.

However, even with 'bink' or 'bonk' sound, students had a large amount of interaction with the computer. It was amazing to see that to try and pronounce some words such as rice, fish, and orange juice, students tried 58 times, 41 times, and 45 times, respectively. In the traditional classroom, they would not have those opportunities. When they pronounced some words 58 or 41 times and they still didn't get them right, they were very disappointed. As a non-native speaker and researcher, I myself didn't know exactly why phonetically some attempts were wrong. I myself couldn't distinguish the difference of wrong 31 trial's banana and right 32 trial's banana. Another important thing that we should think about in the speaking activity is that non-native speakers might never pronounce words as the same way as native speakers do. Then a program's feedback without detailed explanation might not be helpful for some L2 learners. Therefore, I think we need more research and technological development to solve those problems.

For some students, the program was used effectively. Some students used good strategy to pronounce words right. Hearing a native speaker's voice, they got some ideas of

how to pronounce words. For example, to pronounce 'rice', some students first pronounced it 'lice' because Koreans often replace [r] sound into [l] sound, then after hearing native speaker's voice, they changed it into 'rice'. While producing output and hearing feedback, students figured out what was wrong and how to do it. They were very encouraged when they tried hard and got good feedback.

In the listening activity, students had a lot of comprehensible input such as whole question repetition, segmented sentences repetition, and elaboration on meaning, but minimal and all non-linguistic output such as mouse clicks on the screen. Students' interaction with the listening activity was much less than the speaking activity. Because they didn't need to produce linguistic output as they pronounced words a lot of times, they just did mouse clicks. It didn't take much time to complete this activity. In this activity, students also tried to correct their answers after they heard computer's feedback such as "No, that's not correct", "No, keep trying". Then, when they were wrong, they heard whole question repetition again and tried to find a right answer. In these both activities, students' interaction with the computer didn't produce normal conversation. To be normal conversation, students' response should be more than a word or sentence level. Practicing individual word's pronunciation or mouse clicks might not contribute to improvement of normal communication skills. However, this program contributed to expose students to the environment of spoken English and offered students to have interaction through interactional modifications.

There was a large variation in the amount of interaction (using various help options, time spent or number of trials) between individuals depending on learners' level of English,

learning strategy and/or style. Some students used as many options in the program as possible, while others did not.

Most students showed a positive attitude toward learning English with computers. A common difficulty was observed among students in pronouncing some English words that are related to generally known specific Korean problems. It seems that the speech recognition technology is not so perfect as a native-speaking teacher could be. Nevertheless, such multimedia CD-ROM programs including the recently developed speech recognition technology was able to help learners produce more output even though it provides a limited environment.

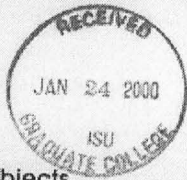
Thus, I think that adapting multimedia CALL activities would be useful in Korea, a country where English is rarely used for social interaction and where there is not enough opportunity for interactional modifications in the second language classroom because there is usually only one non-native speaking teacher who is not trained to teach spoken English and still traditional grammar-based teaching methods are dominant. Therefore, the results showed that students who have a limited environment of spoken English would have more opportunities to have some comprehensible input, output and interaction of spoken English when using multimedia CALL.

However, there are several limitations of the study. First, this study didn't investigate students' improvement for acquisition of the specific linguistic items for which interactional modifications were observed. Thus, it would be very useful to investigate effectiveness of interactions for acquisition of the specific linguistic items in further study, involving a much greater number of students over a longer period of time. Second, the research was performed with only one activity for each of the listening and speaking. Both activities provided limited

opportunities to have interaction with computers. They provided a lot of comprehensible input, but they didn't provide opportunities to have comprehensible output because the output in the speaking activity was to saying one word in the microphone and the output in the listening activity was the mouse clicks. Thus the generalization of this study is limited to the same/similar multimedia activities as in the study. It is recommended that further research needs to use a variety of multimedia programs which provide opportunities for production of comprehensible linguistic output to accomplish communicative goals and to allow further investigation of interaction of learners with a computer.



## APPENDIX A: APPROVED HUMAN SUBJECTS FORM



**Information for Review of Research Involving Human Subjects**  
Iowa State University  
(Please type and use the attached Instructions for completing this form)

1. Title of Project Multimedia approach to interactive teaching of the spoken English to Korean students

2. I agree to provide the proper surveillance of this project to insure that the rights and welfare of the human subjects are protected. I will report any adverse reactions to the committee. Additions to or changes in research procedures after the project has been approved will be submitted to the committee for review. I agree to request renewal of approval for any project continuing more than one year.

<u>Hye-Ryon Cho Hong</u>	<u>Jan. 21, 2000</u>	<u>Hye Ryon Cho Hong</u>
Typed name of principal investigator	Date	Signature of principal investigator
<u>English</u>	<u>203 Ross Hall, Iowa State University</u>	
Department	Campus address	
<u>(515) 268-1814</u>		
Phone number to report results		

3. Signatures of other investigators

<u>Carol Chapelle</u>	<u>Jan. 21, 2000</u>	<u>Sum Conrad for Carol Chapelle</u>
	Date	Relationship to principal investigator
		Major Professor

4. Principal investigator(s) (check all that apply)  
 Faculty     Staff     Graduate student     Undergraduate student

5. Project (check all that apply)  
 Research     Thesis or dissertation     Class project     Independent Study (490, 590, Honors project)

6. Number of subjects (complete all that apply)     10  
 # adults, non-students: \_\_\_\_\_ # minors under 14:  \_\_\_\_\_ # minors 14 - 17: \_\_\_\_\_  
 # ISU students: \_\_\_\_\_ other \_\_\_\_\_  
 (explain): \_\_\_\_\_

7. Brief description of proposed research involving human subjects: (See instructions, item 7. Use an additional page if needed.)  
 The purpose of this study is to see how the ESL learners interact with multimedia software that delivers video and audio in combination with text in order to teach spoken English to Korean elementary school children.  
 (A) From this research, students' interaction with a multimedia program will be examined. I will have students participate in three activities in an ESL software program, 'Smart Start English' by Syracuse Language Systems, Inc. The activities focus on speaking, listening, and conversation. I will monitor and measure students' computer task performance. The activities will be videotaped and should not exceed 30 minutes.  
 (B) The subjects that I will employ will be Korean elementary school children who recently arrived in Ames or who have lived in Ames for less than two years. Subjects will be chosen from a group of personal acquaintances.

(Please do not send research, thesis, or dissertation proposals.)

8. Informed  Signed informed consent will be obtained. (Attach a copy of your form.)

http://www.grad-college.iastate.edu/forms/HumanSubjects.doc GC 8/99

**APPENDIX B: LETTER TO PARENTS FOR PERMISSION OF VIDEO TAPING**

To: Selected ESL students and their parents  
From: Hye-Ryon Cho Hong  
Date: Jan. 21, 2000  
Subject: A request for your permission

I am writing this letter to request your permission that your children participate in a multimedia program task which will provide an opportunity for your children to practice oral communication in English. This task is designed to promote the use of spoken English and the results of the task will be used for my thesis research. The task will take approximately 30 minutes and the whole procedure of students' activity will be videotaped. A student will be asked to participate in speaking, listening, and conversation activities. My research involves ESL learners' interaction with a multimedia program to enhance their spoken English abilities. So I would like to suggest pedagogic implications for an effective way of teaching spoken English to Korean ESL students.

To insure confidentiality, I will remove your children's name and they will not be used in the study. The data I receive from your children will be used for the purpose of my research and information your children give me will be available only to those associated with this research project. I will be glad to answer any question you may have about the study. You are free to end your children's participation at any time.

If you are willing to participate in this project, please read and sign the bottom section of this letter and return only that portion to me. Please keep the top portion for your information.

Thank you for your permission in this project.

Sincerely,

Hye-Ryon Cho Hong

-----  
I give permission for \_\_\_\_\_ (student' name) to participate in Hye-Ryon Cho Hong's thesis project which will examine students' interaction with a multimedia program.

Parent's signature: \_\_\_\_\_

### APPENDIX C: QUESTIONNAIRE TO STUDENTS

Name: \_\_\_\_\_

Grade: \_\_\_\_\_

Question	Strongly agree or positive	Agree or positive	Undecided	Disagree or negative	Strongly disagree or negative
1. I like English.					
2. Learning English is very important.					
3. I like using computers.					
4. I like the listening activity in this program.					
5. My listening skill will be improved by this kind of activity.					
6. I like the speaking activity in this program.					
7. I was comfortable when I spoke with a microphone in the activity.					
8. The computer recognized my speaking properly.					
9. My speaking skill will be improved by this kind of activity.					
10. I was able to concentrate on the activity more than you are in English class with a teacher.					

### APPENDIX D: TABLES SUMMARIZING THE SPEAKING ACTIVITY

Questions to students and numbers of whole questions repeated, of additional hearing of each sentence of A, B or C and their help menus, of additional hearing of the words for answer, of speaking trials, and total times used for one problem for all nine learners.

(Please find the explanation of the following tables in the Results and Discussion section)

#### Question 1

A. You peel it

B. It's soft.

C. It grows on a tree.

What is it? Peas or **banana**?

Student	A	B	C	D	E	F	G	H	I
# of whole question repeated	2	3	0	0	0	0		1	1
# of additional hearing (viewing help menu)									
Sentence A	1(1)	1(1)	0(1)	0(1)	0(0)	0(0)		0(0)	1(0)
Sentence B	1(1)	1(2)	0(0)	0(1)	0(0)	0(0)		0(0)	1(0)
Sentence C	0(0)	2(2)	0(1)	0(1)	0(0)	0(0)		0(0)	1(1)
# of additional hearing (speaking trials)									
Peas	2(2)	2(2)	5(1)	1(0)	0(0)	1(2)		1(0)	2(11)
<b>Banana</b>	2(3 <sup>*</sup> )	8(32)	4(1)	0(3)	1(4)	7(25)		13(15 <sup>*</sup> )	2(6 <sup>*</sup> )
Total time used (min : sec)	2:59	3:14	1:29	1:07	0:22	1:32		1:28	2:07

#### Question 2

A. It's cut.

B. It's soft.

C. It's red.

What is it? Rice or **tomato**?

Student	A	B	C	D	E	F	G	H	I
# of whole question repeated	1	0		1	0			0	0
# of additional hearing (viewing help menu)									
Sentence A	0(0)	0(0)		0(0)	0(0)			0(0)	1(0)
Sentence B	0(0)	0(0)		0(1)	0(0)			0(0)	1(0)
Sentence C	0(0)	0(0)		0(0)	0(0)			0(0)	1(0)
# of additional hearing (speaking trials)									
Rice	0(0)	0(0)		1(0)	0(0)			0(0)	1(0)
<b>Tomato</b>	0(11 <sup>*</sup> )	0(1)		1(1)	0(1)			0(2)	2(10)
Total time used (min : sec)	0:58	0:14		0:31	0:11			0:18	0:55

Question 3

A. It's in a glass.

B. It's cold.

C. You drink it.

What is it? **Milk** or tomato?

Student	A	B	C	D	E	F	G	H	I
# of whole question repeated	0		0	0				0	
# of additional hearing (viewing help menu)									
Sentence A	0(0)		0(0)	0(0)				0(0)	
Sentence B	0(0)		0(0)	0(0)				0(0)	
Sentence C	0(0)		0(0)	0(0)				0(0)	
# of additional hearing (speaking trials)									
<b>Milk</b>	0(1)		0(1)	0(1)				0(1)	
Tomato	0(0)		0(0)	0(0)				0(0)	
Total time used (min : sec)	0:13		0:14	0:19				0:13	

Question 4

A. It's cut.

B. It's milk product.

C. You eat it.

What is it? **Cheese** or soda?

Student	A	B	C	D	E	F	G	H	I
# of whole question repeated	1	0			1	0	1	0	0
# of additional hearing (viewing help menu)									
Sentence A	0(0)	0(0)			0(0)	0(0)	0(0)	0(0)	0(0)
Sentence B	0(0)	1(1)			0(0)	0(0)	0(2)	0(0)	0(0)
Sentence C	0(0)	0(0)			0(0)	0(0)	1(2)	0(0)	0(0)
# of additional hearing (speaking trials)									
<b>Cheese</b>	1(6*)	1(1)			2(7)	0(1)	2(16)	4(5)	1(3)
Soda	1(1)	1(0)			0(0)	0(0)	1(0)	1(0)	0(0)
Total time used (min : sec)	0:44	0:43			0:36	0:12	1:51	0:30	0:23

Question 5

A. You drink it.

B. It's clear.

C. It's cold.

What is it? **Water** or spaghetti?

Student	A	B	C	D	E	F	G	H	I
# of whole question repeated	0	1	1	0	0	0		0	0
# of additional hearing (viewing help menu)									
Sentence A	0(0)	1(1)	0(0)	0(0)	0(0)	0(0)		0(0)	0(0)
Sentence B	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)		0(0)	0(0)
Sentence C	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)		0(0)	0(0)
# of additional hearing (speaking trials)									
<b>Water</b>	1(5)	1(1)	0(1)	0(1)	0(1)	0(1)		0(1)	0(2)
Spaghetti	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)		0(0)	0(0)
Total time used (min : sec)	0:27	0:38	0:16	0:19	0:12	0:10		0:17	0:15

Question 6

A. It's hot.

B. You drink it.

C. It's in a cup.

What is it? **Coffee** or grapes?

Student	A	B	C	D	E	F	G	H	I
# of whole question repeated	0		0			0	0		
# of additional hearing (viewing help menu)									
Sentence A	0(0)		1(1)			0(0)	0(0)		
Sentence B	0(0)		1(1)			0(0)	0(0)		
Sentence C	0(0)		1(1)			0(0)	0(0)		
# of additional hearing (speaking trials)									
<b>Coffee</b>	1(4)		1(1)			3(5)	2(6)		
Grapes	0(0)		1(0)			1(0)	1(0)		
Total time used (min : sec)	0:24		1:33			0:26	0:27		

Question 7

- A. It's on a plate.  
 B. It lives in the water.  
 C. It has eyes.

What is it? **Fish** or banana?

Student	A	B	C	D	E	F	G	H	I
# of whole question repeated	1	2	0	2	0	0		0	1
# of additional hearing (viewing help menu)									
Sentence A	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)		0(0)	1(0)
Sentence B	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)		0(0)	1(0)
Sentence C	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)		0(0)	1(0)
# of additional hearing (speaking trials)									
<b>Fish</b>	1(11*)	9(35*)	5(16*)	7(37*)	1(7)	3(21*)		15(17*)	4(41*)
Banana	1(0)	1(0)	1(0)	2(0)	0(0)	0(0)		0	4(0)
Total time used (min : sec)	0:50	2:26	1:12	2:26	0:29	1:06		1:23	2:28

Question 8

- A. It's not clear.  
 B. It's sweet.  
 C. You drink it.

What is it? **Hamburger** or **soda**?

Student	A	B	C	D	E	F	G	H	I
# of whole question repeated	0						0	0	
# of additional hearing (viewing help menu)									
Sentence A	0(0)						0(0)	0(0)	
Sentence B	0(0)						0(0)	0(0)	
Sentence C	0(0)						0(0)	0(0)	
# of additional hearing (speaking trials)									
Hamburger	1(0)						0(0)	1(0)	
<b>Soda</b>	1(12*)						1(6)	9(12)	
Total time used (min : sec)	0:45						0:23	0:55	

Question 9

- A. You drink it.  
 B. It's hot.  
 C. It's sweet.

What is it? Carrot or **hot chocolate**?

Student	A	B	C	D	E	F	G	H	I
# of whole question repeated	1	0	0	0				0	0
# of additional hearing (viewing help menu)									
Sentence A	1(1)	0(0)	0(0)	0(0)				0(0)	0(0)
Sentence B	1(1)	0(0)	0(0)	0(0)				0(0)	0(0)
Sentence C	0(0)	0(0)	0(0)	0(0)				0(0)	0(0)
# of additional hearing (speaking trials)									
Carrot	1(0)	0(0)	0(0)	0(0)				0(0)	0(0)
<b>Hot chocolate</b>	1(1)	1(1)	0(1)	0(1)				0(1)	0(1)
Total time used (min : sec)	1:13	0:19	0:14	0:13				0:11	0:13

Question 10

- A. It's sweet.  
 B. It's on a plate.  
 C. You cook it.

What is it? **Cake** or hot chocolate?

Student	A	B	C	D	E	F	G	H	I
# of whole question repeated	0	2	1			0		2	0
# of additional hearing (viewing help menu)									
Sentence A	0(0)	1(1)	1(1)			0(0)		0(0)	0(0)
Sentence B	0(0)	1(1)	1(1)			0(0)		0(0)	0(0)
Sentence C	0(0)	0(0)	1(1)			0(0)		0(0)	0(0)
# of additional hearing (speaking trials)									
<b>Cake</b>	0(1)	1(1)	2(2)			2(5)		3(4)	0(2)
Hot chocolate	0(0)	1(0)	2(2)			1(1)		1(1)	0(0)
Total time used (min : sec)	0:10	1:39	1:31			0:50		0:57	0:38



Question 11

- A. It's not clear.  
 B. It's in a glass.  
 C. It's not white.

What is it? Fish or **orange juice**?

Student	A	B	C	D	E	F	G	H	I
# of whole question repeated	1		1	1		2	0	0	
# of additional hearing (viewing help menu)									
Sentence A	1(1)		1(1)	0(0)		0(0)	0(0)	0(0)	
Sentence B	0(0)		1(0)	0(0)		0(0)	1(0)	0(0)	
Sentence C	0(0)		1(1)	0(0)		0(0)	0(0)	0(0)	
# of additional hearing (speaking trials)									
Fish	1(0)		1(3)	2(0)		1(1)	2(1)	3(4)	
<b>Orange juice</b>	2(11*)		4(35*)	2(16*)		6(45*)	1(30)	21(24*)	
Total time used (min : sec)	1:08		2:51	1:22		2:43	1:57		

Question 12

- A. You cook them.  
 B. They grow under ground.  
 C. They are white.

What is it? **Potatoes** or water?

Student	A	B	C	D	E	F	G	H	I
# of whole question repeated		2	0	1	0	1			
# of additional hearing (viewing help menu)									
Sentence A		1(1)	0(0)	1(1)	0(0)	0(0)			
Sentence B		1(1)	0(0)	1(1)	0(0)	0(0)			
Sentence C		2(0)	0(0)	1(1)	0(0)	0(0)			
# of additional hearing (speaking trials)									
<b>Potatoes</b>		3(2)	0(1)	5(14)	0(1)	2(7)			
Water		2(1)	0(0)	5(0)	0(0)	0(1)			
Total time used (min : sec)		1:36	0:10	2:09	0:12	0:51			

Question 13

- A. It's white.  
 B. It's in a bowl.  
 C. You cook it.

What is it? Potatoes or **rice**?

Student	A	B	C	D	E	F	G	H	I
# of whole question repeated		1					0	0	0
# of additional hearing (viewing help menu)									
Sentence A		1(0)					0(2)	0(0)	1(0)
Sentence B		1(1)					0(1)	0(0)	1(0)
Sentence C		1(0)					0(0)	0(0)	1(0)
# of additional hearing (speaking trials)									
Potatoes		4(1)					2(23)	0(0)	1(0)
<b>Rice</b>		12(58*)					4(35*)	22(28*)	2(32*)
Total time used (min : sec)		3:29					2:46	2:05	2:01

Question 14

- A. It's long.  
 B. It's thin.  
 C. It's soft.

What is it? **Spaghetti** or orange?

Student	A	B	C	D	E	F	G	H	I
# of whole question repeated		2		1		0	0		0
# of additional hearing (viewing help menu)									
Sentence A		1(0)		0(0)		0(0)	0(1)		0(0)
Sentence B		1(1)		0(0)		0(0)	0(1)		0(0)
Sentence C		1(0)		0(0)		0(0)	0(1)		0(0)
# of additional hearing (speaking trials)									
<b>Spaghetti</b>		4(7)		7(23*)		0(1)	1(9)		0(1)
Orange		2(0)		3(0)		0(0)	0(0)		0(0)
Total time used (min : sec)		1:41		1:27		0:13	1:01		0:13

Question 15

- A. It's flat.  
 B. It's round.  
 C. You cook it.

What is it? Orange juice or **pizza**?

Student	A	B	C	D	E	F	G	H	I
# of whole question repeated		0		2	0				
# of additional hearing (viewing help menu)									
Sentence A		1(1)		0(0)	0(0)				
Sentence B		1(0)		0(0)	0(0)				
Sentence C		1(0)		0(0)	0(0)				
# of additional hearing (speaking trials)									
Orange juice		1(0)		1(0)	0(0)				
<b>Pizza</b>		1(1)		1(6)	0(1)				
Total time used (min : sec)		0:47		0:38	0:12				

Question 16

- A. It's hot.  
 B. You eat it with your hand.  
 C. It's meat.

What is it? **Hamburger** or pizza?

Student	A	B	C	D	E	F	G	H	I
# of whole question repeated		1		1	1		0	2	1
# of additional hearing (viewing help menu)									
Sentence A		0(0)		0(0)	0(0)		0(0)	0(0)	1(1)
Sentence B		0(0)		0(0)	0(0)		0(0)	0(0)	1(0)
Sentence C		1(1)		0(0)	0(0)		0(0)	0(0)	1(0)
# of additional hearing (speaking trials)									
<b>Hamburger</b>		6(37*)		0(4)	6(23*)		2(10)	9(8)	4(21*)
Pizza		2(1)		0(0)	3(0)		0(0)	1(1)	1(0)
Total time used (min : sec)		2:47		0:32	1:37		0:50	1:24	2:01

Question 17

- A. It's hot.  
 B. You eat it with your spoon.  
 C. It's in a bowl.  
 What is it? Cheese or **soup**?

Student	A	B	C	D	E	F	G	H	I
# of whole question repeated		1	0		1	0		0	
# of additional hearing (viewing help menu)									
Sentence A		0(0)	0(0)		0(0)	0(0)		0(0)	
Sentence B		0(0)	0(0)		0(0)	0(0)		0(0)	
Sentence C		0(0)	0(0)		0(0)	0(0)		0(0)	
# of additional hearing (speaking trials)									
Cheese		1(0)	0(0)		0(0)	0(0)		0(0)	
<b>Soup</b>		1(1)	1(1)		1(6)	0(1)		0(1)	
Total time used (min : sec)		0:35	0:10		0:33	0:13		0:11	

Question 18

- A. They are green.  
 B. They are small.  
 C. They are round.  
 What is it? **Peas** or bread?

Student	A	B	C	D	E	F	G	H	I
# of whole question repeated		0			0		0	0	
# of additional hearing (viewing help menu)									
Sentence A		0(0)			0(0)		0(0)	0(0)	
Sentence B		0(0)			0(0)		0(0)	0(0)	
Sentence C		0(0)			0(0)		0(0)	0(0)	
# of additional hearing (speaking trials)									
<b>Peas</b>		0(1)			17(52*)		0(1)	20(25*)	
Bread		0(0)			1(0)		0(0)	0(0)	
Total time used (min : sec)		0:17			2:48		0:12		

Question 19

- A. It grows under ground.  
 B. It's long.  
 C. It's hard.

What is it? **Carrot** or Ice cream?

Student	A	B	C	D	E	F	G	H	I
# of whole question repeated		0	2	2		0	0	0	0
# of additional hearing (viewing help menu)									
Sentence A		0(0)	0(1)	0(1)		0(0)	0(1)	0(0)	0(0)
Sentence B		0(0)	0(0)	0(0)		0(0)	0(0)	0(0)	0(0)
Sentence C		1(1)	0(0)	0(0)		0(0)	0(0)	0(0)	0(0)
# of additional hearing (speaking trials)									
<b>Carrot</b>		3(3)	4(9)	1(4)		0(1)	1(6)	1(3)	0(1)
Ice cream		1(0)	4(0)	1(0)		0(0)	0(0)	0(0)	0(0)
Total time used (min : sec)		0:47	1:24	1:01		0:10	0:31	0:18	0:11

Question 20

- A. You cook it.  
 B. It's cut.  
 C. It's soft.

What is it? **Bread** or apple?

Student	A	B	C	D	E	F	G	H	I
# of whole question repeated		0			1				0
# of additional hearing (viewing help menu)									
Sentence A		0(0)			0(0)				0(0)
Sentence B		0(0)			0(0)				0(0)
Sentence C		0(0)			0(0)				0(0)
# of additional hearing (speaking trials)									
<b>Bread</b>		1(1)			1(2)				5(41*)
Apple		0(0)			1(0)				2(0)
Total time used (min : sec)		0:17			0:23				1:53

Question 21

- A. They are small.  
 B. You eat them with your hands.  
 C. They are fruit.

What is it? Milk or **grapes**?

Student	A	B	C	D	E	F	G	H	I
# of whole question repeated			1		2	1			
# of additional hearing (viewing help menu)									
Sentence A			3(1)		0(0)	0(0)			
Sentence B			1(1)		0(0)	0(0)			
Sentence C			1(1)		0(0)	0(0)			
# of additional hearing (speaking trials)									
Milk			1(0)		1(0)	1(1)			
<b>Grapes</b>			2(18*)		1(1)	2(4)			
Total time used (min : sec)			2:33		0:33	0:53			

Question 22

- A. It grows on a tree.  
 B. You peel it.  
 C. It's round.
- What is it? Cake or **orange**?

Student	A	B	C	D	E	F	G	H	I
# of whole question repeated			1	1		1		0	0
# of additional hearing (viewing help menu)									
Sentence A			1(0)	0(0)		0(0)		0(0)	0(0)
Sentence B			0(0)	0(0)		0(0)		0(0)	0(0)
Sentence C			0(0)	0(0)		0(0)		0(0)	0(0)
# of additional hearing (speaking trials)									
Cake			2(0)	1(0)		0(0)		0(0)	0(0)
<b>Orange</b>			2(7)	1(2)		0(5)		0(4)	0(1)
Total time used (min : sec)			0:49	0:27		0:40		0:21	0:14

Question 23

- A. It's cold.  
 B. It's sweet.  
 C. You eat it with spoon.

What is it? Soup or **ice cream**?

Student	A	B	C	D	E	F	G	H	I
# of whole question repeated				1		0			
# of additional hearing (viewing help menu)									
Sentence A				0(0)		0(0)		0(0)	
Sentence B				0(0)		0(0)		0(0)	
Sentence C				0(0)		0(0)		0(0)	
# of additional hearing (speaking trials)									
Soup				0(0)		1(0)		2(0)	
<b>Ice cream</b>				1(12)		6(33)		21(23*)	
Total time used (min : sec)				1:07		1:55		1:48	

Question 24

- A. It grows on a tree.  
 B. You eat it with your hands.  
 C. It's hard.

What is it? Coffee or **apple**?

Student	A	B	C	D	E	F	G	H	I
# of whole question repeated						0	0	0	0
# of additional hearing (viewing help menu)									
Sentence A						0(0)	0(0)	0(0)	0(0)
Sentence B						0(0)	0(0)	0(0)	0(0)
Sentence C						0(0)	0(0)	0(0)	0(0)
# of additional hearing (speaking trials)									
Coffee						0(0)	0(0)	0(0)	0(0)
<b>Apple</b>						0(1)	0(1)	0(1)	0(1)
Total time used (min : sec)						0:12	0:13	0:13	0:13

**APPENDIX E: TABLES SUMMARIZING THE LISTENING ACTIVITY**

Questions, numbers of whole question repeated, of additional hearing of each description of A, B or C, and their help menus, and total time used for each question.

(Please find the explanation of the following tables in the Results and Discussion section)

1. I'm looking for my niece.  
 A. She is thin.  
 B. She is wearing glasses.  
 C. She has black hair.  
 Who is it?

Student	A	B	C	D	E	F	G	H	I
# of whole question repeated	0	1	0	0	0	0	1	0	0
# of additional hearing (viewing help menu)									
Sentence A	0(0)	1(1)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
Sentence B	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
Sentence C	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
Total time used (min : sec)	0:17	0:43	0:13	0:13	0:11	0:12	0:32	0:11	0:11

2. I'm looking for my cousin.  
 A. He is drinking something.  
 B. He has straight black hair.  
 C. He wears white.  
 Who is it?

Student	A	B	C	D	E	F	G	H	I
# of whole question repeated	0	1	0	2	0	2	0	0	0
# of additional hearing (viewing help menu)									
Sentence A	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
Sentence B	0(0)	1(0)	0(0)	0(1)	0(0)	0(0)	0(0)	0(0)	0(0)
Sentence C	0(0)	1(1)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
Total time used (min : sec)	0:11	1:08	0:12	0:42	0:13	0:36	0:11	0:12	0:10



3. I'm looking for my cousin.  
 A. She is thin.  
 B. She has blond hair.  
 C. She is wearing a vest.  
 Who is it?

Student	A	B	C	D	E	F	G	H	I
# of whole question repeated	0	3	1	0	1	0	0	1	0
# of additional hearing (viewing help menu)									
Sentence A	0(0)	1(1)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
Sentence B	0(0)	2(1)	1(1)	0(0)	1(1)	0(0)	0(0)	0(0)	0(0)
Sentence C	0(0)	1(1)	0(0)	1(1)	0(0)	0(0)	0(0)	0(0)	0(0)
Total time used (min : sec)	0:15	1:59	0:44	0:25	0:34	0:10	0:11	0:28	0:12

4. I'm looking for my aunt.  
 A. She is heavysset.  
 B. She has brown hair.  
 C. She wears glasses.  
 Who is it?

Student	A	B	C	D	E	F	G	H	I
# of whole question repeated	1	1	0	0	1	2	0	2	0
# of additional hearing (viewing help menu)									
Sentence A	0(0)	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)	1(1)
Sentence B	0(0)	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)	1(0)
Sentence C	0(0)	0(1)	1(1)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
Total time used (min : sec)	0:31	0:27	0:56	0:13	0:31	0:23	0:12	0:45	0:45

5. I'm looking for my brother.  
 A. He is thin.  
 B. He has blond hair.  
 C. He wears blue.  
 Who is it?

Student	A	B	C	D	E	F	G	H	I
# of whole question repeated	1	1	0	0	0	0	0	1	0
# of additional hearing (viewing help menu)									
Sentence A	0(0)	2(1)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
Sentence B	0(0)	1(1)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
Sentence C	0(0)	1(1)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
Total time used (min : sec)	0:20	1:55	0:32	0:11	0:09	0:11	0:11	0:18	0:14

6. I'm looking for my nephew.  
 A. He is wearing glasses.  
 B. He is thin.  
 C. He has straight hair.  
 Who is it?

Student	A	B	C	D	E	F	G	H	I
# of whole question repeated	0	1	2	3	1	0	0	1	0
# of additional hearing (viewing help menu)									
Sentence A	0(0)	1(1)	1(1)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
Sentence B	0(0)	2(1)	1(0)	0(1)	1(0)	0(0)	0(0)	0(0)	0(0)
Sentence C	0(0)	1(1)	2(1)	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)
Total time used (min : sec)	0:11	1:52	1:36	1:19	0:45	0:10	0:11	0:27	0:12

7. I'm looking for my friend  
 A. She has curly hair.  
 B. She is heavysset.  
 C. She is wearing yellow.  
 Who is it?

Student	A	B	C	D	E	F	G	H	I
# of whole question repeated	1	1	0	0	0	0	0	0	0
# of additional hearing (viewing help menu)									
Sentence A	0(0)	1(1)	0(0)	0(1)	0(0)	0(0)	0(0)	0(0)	0(0)
Sentence B	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
Sentence C	0(0)	1(1)	0(0)	1(1)	0(0)	0(0)	0(0)	0(0)	0(0)
Total time used (min : sec)	0:23	1:03	0:14	0:35	0:13	0:12	0:14	0:14	0:12

8. I'm looking for my uncle.  
 A. He is wearing a tie.  
 B. He is short.  
 C. He has straight hair.  
 Who is it?

Student	A	B	C	D	E	F	G	H	I
# of whole question repeated	2	0	0	0	0	0	0	1	0
# of additional hearing (viewing help menu)									
Sentence A	0(0)	1(1)	0(1)	0(1)	0(0)	0(0)	0(1)	0(0)	0(0)
Sentence B	0(0)	1(1)	0(0)	0(1)	0(0)	0(0)	0(1)	0(0)	0(0)
Sentence C	0(0)	1(1)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
Total time used (min : sec)	0:38	1:07	0:25	0:58	0:10	0:10	0:21	0:25	0:12

9. I'm looking for my grandfather.  
 A. He is tall.  
 B. He is wearing sports jacket.  
 C. He is drinking something.  
 Who is it?

Student	A	B	C	D	E	F	G	H	I
# of whole question repeated	0	1	0	0	0	0	0	0	0
# of additional hearing (viewing help menu)									
Sentence A	0(0)	1(1)	0(0)	0(0)	0(0)	0(0)	0(1)	0(0)	0(0)
Sentence B	0(0)	1(1)	0(0)	0(0)	0(0)	0(0)	0(1)	0(0)	0(0)
Sentence C	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
Total time used (min : sec)	0:10	1:12	0:19	0:14	0:10	0:32	0:26	0:11	0:10

10. I'm looking for my uncle.  
 A. He is heavysset.  
 B. He is eating.  
 C. He has red hair.  
 Who is it?

Student	A	B	C	D	E	F	G	H	I
# of whole question repeated	0	1	0	0	0	0	0	0	0
# of additional hearing (viewing help menu)									
Sentence A	0(0)	1(1)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
Sentence B	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
Sentence C	0(0)	1(1)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
Total time used (min : sec)	0:11	1:01	0:11	0:11	0:10	0:11	0:09	0:10	0:10

11. I'm looking for my cousin.

A. She is tall.

B. She has curly hair.

C. She is eating.

Who is it?

Student	A	B	C	D	E	F	G	H	I
# of whole question repeated	0	1	2	0	0	0	1	0	0
# of additional hearing (viewing help menu)									
Sentence A	0(0)	2(1)	0(0)	0(1)	0(0)	0(0)	1(1)	0(0)	0(0)
Sentence B	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
Sentence C	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(1)	0(0)	0(0)
Total time used (min : sec)	0:12	1:00	0:33	0:24	0:10	0:10	0:43	0:11	0:12

12. I'm looking for my aunt.

A. She is wearing yellow.

B. She has brown curly hair.

C. She is eating.

Who is it?

Student	A	B	C	D	E	F	G	H	I
# of whole question repeated	0	1	0	0	0	0	0	0	0
# of additional hearing (viewing help menu)									
Sentence A	0(0)	1(1)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
Sentence B	0(0)	1(0)	0(0)	0(1)	0(0)	0(0)	0(0)	0(0)	0(0)
Sentence C	0(0)	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
Total time used (min : sec)	0:11	0:45	0:15	0:25	0:14	0:10	0:13	0:11	0:10

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