Online Dictation Practice: Teacher Customizable

Barry Duell Tokyo International University Daisuke Naganuma Tokyo International University Hideyasu Sugita Tokyo International University

Reference Data:

Duell, B., Naganuma, D., & Sugita, H. (2005). Online Dictation Practice: Teacher Customizable. In K. Bradford-Watts, C. Ikeguchi, & M. Swanson (Eds.) *JALT2004 Conference Proceedings*. Tokyo: JALT. The authors have created an online dictation system especially designed to help weak students. The skills addressed are listening, typing, and spelling. The system consists of an online user interface, and an engine that drives the system. Main features include interactive help for student completion of exercises, and step by step guidance through this process. Students first listen to an online sound clip, and then transcribe as much as they can. Next, students can request feedback from the system to check the accuracy of the transcription. The process of listening, typing, and requesting feedback is continued until the transcription is accurately completed. When a transcription is near completion, the system is able to tell students which letters are correct in words they are trying to type. Interested teachers are encouraged to freely use this system with their students. Likewise, teachers may freely design their own exercise interfaces around our engine.

英語の聞き取りと書き取り技術の向上を支援する Web サイトの構築を行った。この Webサイトは、音声提示と回 答入力のためのユーザインタフェース部分と、入力された文をチェックするエンジン部分から構成される、英語学習の ための自習システムである。学生は、音声を再生し、聞き取った文を入力する。入力に間違いがあった場合、システムはヒ ントを学生に提示する。このシステムの最大の特徴は、ヒントを表示して再入力を求めることにより、対話的に文を完成 に導くという点である。システムは、入力を受け取ると、正しい語を表示し間違った語や不足している語の入力を促す。 文が完成に近づいた場合は、単語の綴りを直していけるように文字単位でヒントを出すようになる。教師は、システムの エンジン部分のみを利用することにより、独自の練習問題を持つサイトを作ることも可能である。

ictation has been used for foreign language teaching since the Middle Ages. One purpose for its use has been to help students learn the sounds and spellings of the target language. Montalvan emphasizes that dictation can encourage improvement of students' listening, memory, and spelling skills since words or phrases must be remembered in order to write them down (circa 1990).

Two important points that Alkire makes about dictation are that it helps encourage students to think in the target language, and that it also helps them become aware of correct phrasing and pronunciation (2002).

One author of this paper, Duell, has for many years used dictation exercises in Conversation, LL, and CALL classes. These served both as warming-up exercises, and as a test of how well students had mastered key words and phrases in the current week's lesson. Due to having non-English major students weak in English, Duell attempted to be as encouraging as possible by awarding points for each correctly spelled word. For Conversation classes, the limitation of this method was that students had access to dictation practice only for the few minutes this was done in class. LL, and later CALL, classes allowed for Duell's voice to be recorded, and

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then individually played back as many times as necessary during the allotted dictation test time. But, whether in Conversation, LL, or CALL class, students only had Duell's help understanding the answers during a brief explanation time after the weekly test (Duell, 1993; Duell, 1994).

A better way was needed to allow students to do dictation exercises on their own. This led three faculty/staff of Tokyo International University (TIU) to work together to create the online dictation project described below. Duell (planner/debugger/classroom tester) worked with Naganuma (programmer) and Sugita (interface designer) to experiment with suitable ways to:

- Create interesting online interfaces to provide students, especially those with a low-level of English ability, with encouraging, self-grading dictation exercises available anytime for student self study,
- 2) Share this work with others by allowing educators to design their own interfaces for utilizing the system's engine, or to plug in their own dictation material to existing interface templates.

Early development of this project is explained in more detail in Duell and Naganuma (2003).

Below, the mechanics of the dictation system's engine are explained. The merits and demerits are examined of three types of interfaces built around the system's engine. Screen shots of these interfaces are included to help the reader better visualize the system's workings. Questionnaire and dictation log data are also examined to see what students think of the dictation system, to see how well the system holds students' attention, and to determine if it helps improve their skills.

Self-Grading English Dictation System (SGEDS) How data flows in the Self-Grading English Dictation System

The SGEDS Engine resides on a TIU server. Files necessary for conducting dictation exercises can be placed on any server accessible by the Engine via the Internet. This is shown in **Figure 1** with arrows connecting "Exercise engine site" and "Exercise data site". While the system is designed for TIU students, anyone with Internet access is free to use these exercises.

TIU students can access SGEDS exercises either from Internet connected classrooms, student study areas, or from Internet connected PCs at home or elsewhere. Exercises are accessed via a teacher-created interface which links to dictation sound files (sound data flows from the Exercise data site to Student PCs). A student then types part or all of the passage in a text box as shown in Figure 6 (See Appendix 1). Clicking on the "Check Answer" button sends the student's work to the Exercise engine site. The Engine sends a request for the correct answer to the Exercise data site which returns this data to the Engine. The Engine checks the student's passage in a process illustrated below in Chart 1 and Chart 2, and returns the results to the student as shown in Figure 7 (See Appendix 1). A student repeats the process of listening to the sound file, transcribing, and clicking the "Check Answer" button until the transcription is successfully completed as shown in Figure 8 (See Appendix 1).

The Exercise data site can be not only a server, but also a CD-ROM, floppy disk, or other media. These non-server media can be directly placed in a student's computer,



Exercise engine site

Figure 1. Data flow in the Self-Grading English Dictation System. The process begins when a student accesses exercise data via a teacher designed dictation interface.

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obviating any need to place data on a server. While this is J advantageous for teachers without server access, it may be • time-consuming to update dictation exercises. .

Not only TIU English faculty, but also any other educators interested in our system are free to utilize it by using one of ų. 0 the interfaces described below, or by creating new interfaces utilizing our Engine. The minimum requirement for creating a • dictation exercise is to have a directory containing the transcript 5 of the dictation exercise, a file containing the name of the sound file, and a sound file. In order for the SGEDS Engine to operate on these, the first two files must be named "a.txt" and "s.txt" respectively. The server that hosts the directory can be a TIU server, or any other server on the Internet. 0 ŋ

How the SGEDS Engine grades student input

Students may type any words they recognize in a dictation passage. Skipping unknown words is acceptable. The SGEDS Engine then attempts to match a student's efforts against the master text. The Engine will return only the correct words to the student allowing him/her to continue transcribing the dictation. When the Engine is 100 percent certain which word a student is attempting to spell, it will begin rewarding a student's spelling efforts by giving hints as to which letters are correct as shown in Figure 7 (See Appendix 1).

Chart 1 demonstrates how the Engine parses student input where the target sentence is "This is a pen. It belongs to John." In this example, a student has input: "This pen, it birong to Jhon." The first round of parsing, not shown in Chart 1, yields "This * pen. It * to *." where "*" indicates words not

yet correctly spelled. The Engine can be certain that "birong" is a student's attempt at spelling "belong" since both "It" and "to" which flank "belong" have been correctly typed. "Jhon" is likewise determined to be a student's attempt at spelling "John" since it is flanked by the correctly spelled "to" and a period ending the sentence. Therefore, both "birong" and "Jhon" are sent to the Engine's spell correction matrix. This is demonstrated in Chart 2 for the case of "birong".

Chart 2 shows the Engine's spell correction matrix returning "b+ong+" as a reward for a student spelling "belong" as "birong". The "+" marks indicate missing letters. The fully parsed result returned to a student is "This * pen. It b+ong+ to Jo+n." as shown in Chart 1.

To help the Engine to be as encouraging as possible to student dictation efforts, a number of "bugs" were introduced. These are given below for the case of the target text "This is a pen. It belongs to John.":

- 1) Case insensitivity. For example, "this IS a pEN. IT beLONgs To john." is recognized as correct.
- 2) Ignore punctuation. For example, "This. is, a;pen: It?belongs/to John!" is recognized as correct.
- 3) Ignore extraneous words and spaces. For example, "This is a ball point pen. It belongs to John Wayne." is recognized as correct.
- 4) Unguarded accessibility to the answer file. Anybody wanting to see the dictation answer can easily access it.
- 5) Give credit for all occurrences of a word in a passage, even though a student types it but

Correct answer		This	is	а	pen.	1.411	It	belongs	to	John.	
Pre-matching state		This	is	a	pen		It	belongs	to	John	•
	This	This	11 - Harrison I.								340 (40)
			*		- Proventidate da Antonio		1909 		e de la companya de la		
4.1 (4) (5)	16.1			*							
	pen			and the second	pen		1997				
Pattern matching matrix	,										
(Student typed words)	it	•					It				
	birong		1.1					b+ong+			
	to								to		
	Jhon									Jo+n	
			· · · · · · · · · · · · · · · · · · ·						3 		1
Pre-output state		This	*	*	pen	•	It	b+ong+	to	Jo+n	•
Returned words		This	1	*	pen.		It	b+ong+	to	Jo+n.	

Chart 1. How the SGEDS Engine parses a student's work. In this example, a student has attempted to spell "This is a pen. It belongs to John." by typing "This pen, it birong to Jhon."

once. For example, if a student working on the passage "She went to the store, to the office, and then to the museum." types "to the", (s)he will automatically be given credit for all three occurrences of these words.

Demonstration interfaces

The authors have experimented with a number of ways to use the SGEDS Engine to determine what might be most useful for students and teachers. Introduced below are three different interfaces, each utilizing the Engine.

Basic interface

Figure 2 (see Appendix 1) illustrates a very basically designed interface by one of the authors (Duell). A basic interface such as this is quick to put together. Also, any type of sound or video file that a student's computer will play may be used. This interface's biggest demerit is that students are drawn away from their dictation window when a sound file is clicked since either a new window or software opens depending upon a computer's settings. It is rather awkward going back and forth between the text box and sound player (Duell & Naganuma, 2001).

Correct answer b e 1 0 n g S b b i r + Pattern matching matrix + (Student typed letters) 0 0 n n g g + Pre-output state b + + 0 n g + **Returned** letters b g + 0 n +

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Chart 2. How the SGEDS Engine parses selected words. In this example, a student has attempted to spell "belongs" by typing "birong".

Improved interface

One of the authors (Sugita) improved upon the above basic interface, incorporating it into the TIU Language Education Laboratory website. Put online in April 2004, the improved interface allows students to listen to dictation exercises without other windows or software opening since a Flash sound player is built into the same page as the text box. **Figure 3** (see Appendix 1) pictures one exercise, and shows the Flash sound player, a text box for typing the dictation, and the Check Answer button. The main demerit of this interface is that sound files can only be in MP3 format (Duell, Naganuma & Sugita, 2004a).

Both the Basic and Improved interfaces use a selection of passages of varying difficulty that do not necessarily have any connection with each other. At this stage, the purpose was to test how well the system worked, and to see how students responded to it.

"Variety of English Speakers" interface

The authors' most recently designed interface, completed in

November 2004, is illustrated in **Figure 4** (see Appendix 1). It is built around the theme of TIU native English speaking professors introducing themselves. Students try to transcribe the dictated answers to five questions that each person answers. To add variety to students' listening experience, native speakers with a variety of accents and nationalities were selected (Duell, Naganuma & Sugita, 2004b).

• For ease of collecting photos and sound files for the 5 site, one of the authors (Duell) used lightweight portable 1 equipment to photograph and record teachers near their Ũ classrooms. This approach required busy teachers to spare but a few minutes for cooperating with this project. An đ Apple iPod with a Griffin iTalk attachment was used to 0 record teachers in nearby, relatively quiet locations. A E Kyocera Finecam was used to photograph the teachers. 0 Using iPod/iTalk provided sufficiently good recordings, C and the Finecam provided sufficiently good photos, so the • utilization of this "portable recording/photo studio" method will be considered for subsequent SGEDS projects.

One of the questions that each speaker answers concerns where they are from. Though all six speakers begin their answer with "I'm from", the actual location can be difficult for students to spell. As an aid, students are given various hints throughout the website. As shown in **Figure 4** (see Appendix 1), each speaker's short biodata includes where they are from. Likewise, as shown in **Figure 5** (see Appendix 1), placing the cursor over a speaker's photo causes a red light to flash over the area of the world map where the speaker is from. A third hint also appears at this time. As the red light flashes, two lines of text in Japanese appear explaining where the speaker is from.

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Finally, if a student clicks on a speaker's photo, a page appears featuring links introducing the speaker's native area. These links are shown in **Figure 6** (see Appendix 1).

Figure 6 also illustrates what a student sees after clicking Question 3 "Where am I from?".

Example logs of student work

Given below are two logs of non-English major, TIU student dictation attempts.

The first log, with one step recreated in **Figure 7** (see Appendix 1), shows a student's transcription efforts in answering where the speaker in **Figure 6** is from. The data shown for this TIU freshman are:

- 1) The time stamp for when the student clicked the Check Answer button,
- 2) The typed passage sent to the Engine for correction,
- 3) The corrected passage returned by the Engine.

It should be noted that students are encouraged to frequently click on the Check Answer button in order to check their progress.

[15:57:07]
i'm from salam oregon in the unated states
I'm from Sal+m, Oregon in the Un+ted States.
[15:57:27]
I'm from Salum, Oregon in the Un+ted States.
I'm from Sal+m, Oregon in the Un+ted States.
[15:57:38]

U	I'm from Salam, Oregon in the Un+ted States.	[14:14:20]
	I'm from Sal+m, Oregon in the Un+ted States.	One thing it's famous for b
τ.	[15:57:58]	One thing it's famous for *.
9	I'm from Salrm, Oregon in the Un+ted States.	[14:16:00]
5	I'm from Sal+m, Oregon in the Un+ted States.	One thing it's famous for is beautyfull
Ž	[15:58:34]	One thing it's famous for is *.
Ē	I'm from Salem, Oregon in the Un+ted States.	[14:16:56]
a	I'm from Salem, Oregon in the Un+ted States.	One thing it's famous for is beatifui.
J	[15:58:59]	One thing it's famous for is *.
D	I'm from Salem, Oregon in the United States.	[14:17:18]
Đ	I'm from Salem, Oregon in the United States.	One thing it's famous for is beautiful*.
	What is first noticeable is that the student has begun the	One thing it's famous for is beautiful *.
5	exercise by correctly typing "I'm from". If we were to examine	[14:17:44]
	the full log of all this student's dictation sessions, we would see that the student initially faltered when earlier attempting	One thing it's famous for is beautiful sinely*.
	to type the first part of another speaker's answer to the same	One thing it's famous for is beautiful s+e+e+y.
1	question. But, since the basic pattern of answering is the same	[14:18:04]
-	for all six speakers, once a student discovers "I'm from" to be	One thing it's famous for is beautiful s+e+ery.
2	the correct starting phrase, it can be used for answering the other speakers' answers to the same question	One thing it's famous for is beautiful s+e+ery.
A	Because the student's two mistured words in the first line	[14:18:17]
Ζ	of the log are flanked by correctly typed words in the Engine	One thing it's famous for is beautiful sie+ery.
4	credits the student for correctly typed letters. It took just	One thing it's famous for is beautiful s+e+ery.
8	under two minutes for the student to determine the correct	[14:18:24]
N	answer. Figure 8 (see Appendix 1) illustrates the reward	One thing it's famous for is beautiful sue+ery.
5	Following is the log of a TILL sophomore's attempt to	One thing it's famous for is beautiful s+e+ery.
Z	answer Ouestion 4 shown in Figure 6 : "What is my state	[14:18:39]
	famous for?":	One thing it's famous for is beautiful s+enery.

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One thing it's famous for is beautiful s+enery. [14:18:55]

One thing it's famous for is beautiful seenery. One thing it's famous for is beautiful s+enery. [14:19:05]

One thing it's famous for is beautiful swenery. One thing it's famous for is beautiful s+enery. [14:19:17]

One thing it's famous for is beautiful senery.

One thing it's famous for is beautiful s+enery. [14:19:30]

One thing it's famous for is beautiful scenery. One thing it's famous for is beautiful scenery.

As in the case of the freshman student's log discussed above, the initial phrase "One thing it's famous for" has been successfully learned after transcribing answers given by other speakers at this site for the same question.

However, it took this sophomore more than five minutes to finally type the passage correctly. Each of the student's attempts to spell "beautiful", from [14:14:20] to [14:16:56], was returned as "*" even though a number of letters were correctly typed. Though the reader can quickly see what the student was attempting to spell, the Engine is not yet sophisticated enough to correct an individual word unless there is first a correctly spelled word, or a punctuation mark flanking it. While it took about three minutes for the student to finally type "beautiful", it did not take much more than two minutes to type "scenery". The student was assisted in spelling "scenery" by the Engine's word correction feature.

Student impressions of SGEDS

One of the authors (Duell) has had students try out all three of the interface styles introduced above. Students were generally pleased with the system, even when using the awkward to use basically designed interface (Duell & Naganuma, 2001). One group of users consisted of either freshman or sophomore students of Duell who were majoring in business and commerce. Another group of users consisted of high school seniors. These seniors were at TIU either for an Open Campus recruiting program where sample classes were offered, or who were already accepted for admission and taking open house pre-freshman classes.

Reaction of freshmen and sophomores to the "Variety of English Speakers" interface ranged from "too easy" to "a little hard" (Duell, Naganuma & Sugita, 2004b). High school seniors generally found the material to be "a little hard". Most of the above students were generally pleased with the interface and content. The log of student work shows that most worked on individual problems to as near completion as students were able to achieve either before completing an exercise, or finally giving up and advancing to a new problem. This seems to indicate that the material and interface were sufficiently interesting for holding students' attention, no easy task in an age when young people quickly switch from one TV channel or Internet website to another if the contents are not sufficiently attractive.

Of 171 high school seniors surveyed in 2000 and 2001 during TIU Open Campus days, 90 percent found using the SGEDS system "interesting" or "somewhat interesting". Twenty-six percent found the material "difficult", 37 percent found it "a little difficult", and 29 percent found it "just right". At this time, the only SGEDS interface was the basic one described above and pictured in **Figure 2** (see Appendix 1). Its content consists of randomly chosen sentences of varying difficulty.

The logs of student work also show that there are students Ť 0 who listen to a selection many times before successfully completing an exercise. SGEDS has several advantages • over a live native speaker in this regard: 1) It never tires of 5 repeating the same passage. Each passage is expressed in an identical manner no matter how often it is repeated. 2) The Ũ only facial contact with a student is via the non-threatening photos of the native English Speakers in the case of the đ "Variety of English Speakers" interface. How intimidating 0 Π it might be were it a live speaker repeating the same phrase E again and again, perhaps with an increasingly tired and 0 irritated expression. 3) The material is available 24 hours a C day. 4) The exercises are accessible via the Internet at TIU, at home, or elsewhere.

Conclusion

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The SGEDS system remains a work in progress in how to help TIU students, especially those non-English majors who are weak at English, improve their listening, typing, and spelling skills. The system is primarily designed to be used for self study, though it can be used in a CALL class. The system is fairly easy to use even without reading the directions provided. The system's latest interface, "Variety of English speakers", seems to be the most effective of the authors' three interfaces for ease of use, and holding students' attention. This interface's integrated material, that is, six speakers answering the same set of questions, seems to be especially effective for helping weaker students since the dictated material contains a common set of vocabulary and grammar structures used by all the speakers.

As SGEDS has only been tested with students during short term sessions, it will be necessary for the authors to conduct longer term studies to better determine the efficacy of SGEDS for improving student listening, typing, and spelling skills. Nonetheless, short term session results from questionnaires and logs show promise for the system to hold students' interest, and to help them improve their skills. Likewise, logs of student work for the "Variety of English Speakers" interface show that when students succeed in transcribing a given pattern, they are generally able to make good use of this pattern when transcribing similar answers spoken by the other speakers.

Having the SGEDS available via the Internet allows students to use it not only in a TIU classroom, but also for self study outside of class whether at school or at home. While the system was designed for use by students at the authors' university, it is freely accessible via the Internet for use by anyone who may wish to utilize it.

While some examples have been introduced here of how the system might be utilized for helping weak students, the way it can be used is only limited by an educator's imagination. According to an educator's web design and dictation content, the learning needs of more advanced students could also be addressed.

Educators are free to incorporate the SGEDS Engine when designing their own dictation exercise sites.

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English Dictation Exercises

Graded online

Try out your dictation skills. Click on a link below:

Exercise 1 (Very Easy)

Exercise 2 (Easy)

Exercise 3 (A Little More Difficult)

Exercise 4 (A Little More Difficult)

Exercise 5 (Advanced)

Look up words in the Oxford Advanced Learner's Dictionary

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Figure 2. Basic SGEDS interface.

The five exercise links lead to the appropriate sound files and text boxes necessary for doing the dictation exercises.

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		00:00 / 00:04 ()
	1. 上のプレイヤーで問題文を聴いてく	ください。
	2. 聴いた文を下のテキストボックスに入力	してください。
	3. 下の「Check Answer]ボタンを押し	てください。
	Check Answer Reset	
	Return to <u>Main Page</u>	
	Copyright 2000-2004 by Barry Duell and Daisuke Nagan	uma. All rights reserved.

Figure 3. Improved interface.

Exercise 1 above is but one exercise available from the main exercise menu. The main components shown in this screen shot are the Flash sound player, the text box for students to type an exercise, the "Check Answer" button for correcting student work, and the link back to the main exercise menu.



Figure 4. "Variety of English Speakers" interface.

This opening page allows students to choose among six native English speakers who teach at TIU. The three females and three males are from four countries, and therefore expose students to a variety of tones, speeds of delivery, dialects, and other variations.



Figure 5. Geographical hints about each speaker.

Three of the four available hints are shown for helping students correctly type where each speaker explains they are from: 1) Holding the cursor over a speaker causes a marker to appear on the map over that person's home area, 2) In parallel with the map marker, a Japanese explanation of the speaker's origin appears, 3) Information about a speaker's origin is included in their biodata.

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	O2. Barry Duell 学部:商学部 担当授業: English 1 Conversation, CALL, etc. リンク: <u>My state's website</u> <u>My city's website</u> <u>My v</u>	<u>vebsite</u> nnswers.
1 What is my pame?	El 02: Listen	00-00 / 0
2. Where do Lteach?	FIG: Type the answer	
3. Where am I from?	3. Where am I from?	
4. What is my state famous for?		
5. What is my hobby?		
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Figure 6. Interface for listening to, and transcribing, a passage.

To aid weak students, each of the six speakers answers five similar questions. The resulting overlap of basic sentence structures and vocabulary in the answers is designed to help give students confidence. This screen shot shows what a student sees after clicking on "Where am I from?". To the right in descending order are the Flash sound player for listening to the dictation passage, a reminder to the student as to what the currently selected question is, the text box for typing the dictation, and the Check Answer button. Under the speaker's name are links for aiding students in correctly spelling the place names in the speaker's answer. Additional place name hints are described in Figure 5.



Figure 7. Example of a student's typed work, and the corrected result.

The student can see that Question 3 is being worked on, and that six of the sound clip's eight words have been correctly typed. The second row from the bottom show's what the student just input. The bottom row contains the corrected text, with "+" indicating missing letters. The "Check Answer" button can be clicked as often as necessary during the session to help a student correctly type the passage.

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Figure 8. Successful completion of a dictation exercise.

A student is shown a congratulatory illustration, a note that all eight words have been correctly typed, and the correctly typed answer. The player remains available so a student may again listen to the sound clip.