自宅学習ウェブサイトを用いた
発音学習の促進について

Enhancing Pronunciation Learning through a Web-based Tutorial

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本研究は、著者が作成した発音に関する自宅学習ウェブサイトが、日本人大学生が英語の発音を向上させるのに効果をもたらしたのかについて調査したものである。このウェブサイトは、実践的な発音理論や Computer Assisted Language Learning（コンピューターを用いた言語学習）理論に基づいて作成され、インテリジブルな発音（完全にネイティブのようではないが、意思疎通に支障のない発音）の獲得を促進することをねらいとしている。ウェブサイトには様々なビデオ・クリップも掲載されており、各国スピーカーによるワールド・イングリッシュの例や、日本人モデルによるシャドーイング練習方法も映像で見ることができる。

　研究課題としては、第一に、ウェブサイトを用いた自宅学習後に、学生がリンキング（音の連結）を正確に発音できるようになったか、第二に、学生がインテリジブルな発音を獲得したかどうか、第三に、学生がウェブサイトに関してどのような技術的利点や欠点を経験したか、の三点に焦点を絞った。

　研究データには、研究の前後に学生の発音を録音したもの、学生が記入したアンケート用紙と自己評価用紙が含まれている。録音された学生の発音の分析には、著者が作成した評価基準が用いられ、リンキング箇所の正確さと、発話全体のインテリジビリティの二点に関して評価を行った。

　結論として、このウェブサイトは、学生がインテリジビリティを向上させるのに効果があることがわかった。

The authors conducted research to find out if their hand-made pronunciation tutorialwebsite helped their Japanese college students to improve their English pronunciation. The website is based on practical pronunciation theories and CALL theories, and encourages intelligible pronunciation. It contains video-clip examples of world Englishes and instructional videos for shadowing practice.
The authors investigated whether the website helped the students learn pronouncing linking parts accurately, if the website enhanced the students improve their intelligibility, and what the technological advantages and disadvantages in the students' web-based learning are.
As for the data of the study, the students did recordings twice and answered a questionnaire and a self-evaluation sheet. Then, two evaluators rated each speech according to accurate pronunciation of linking parts and overall intelligibility using a rubric the authors created.
In conclusion, the authors discovered that the website helped the students improve their intelligibility.

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1. Introduction

The authors created a pronunciation tutorial website based on practical pronunciation theories and CALL theories. The website is designed for our potential target, high school to college Japanese students who are at the intermediate level. The reason the website was focused on pronunciation is that teaching pronunciation is sometimes overlooked in the classroom in Japan. We designed it as a self-study tutorial so that Japanese students would have extra pronunciation practice outside the classroom using it.

The application is put on the website for an extremely wide audience to learn about fluent pronunciation. All the students need is a personal computer and internet access. They need not learn difficult technologies to use it. Thus, in the application, technology is not a barrier for students to learn a language (Egbert and Hanson-Smith, 1999).

Our goal of the web-based project is that students will understand linking rules and be able to pronounce phrases using linking, which leads to improve their intelligibility. Linking is "connecting the final sound of one word or syllable to the initial sound of the next (Celce-Murcia et al., 1996, p158)." If one does not do linking, he sounds choppy (Dauer, 1993). Celce-Murcia (1996) mentions "a learner's command of segmental features is less critical to communicative competence than a command of supra-segmental features, since the supra-segmental carries more of the overall meaning load than do the segmental (Celce-Murcaiet al.,1996, p131)." McNerney and Mendelsohn (1987) also say "the supra-segmental of language contributes more to intelligibility than segmental aspects (McNerney and Mendelsohn, 1987, p323)." However, Japanese students are likely to believe that pronouncing each individual word clearly is the most important to make a clear speech. That is why we focus on linking, one of the supra-segmental features. We believe that the web-based tutorial help Japanese students practice linking to speak English more intelligibly.

2. The main features of the website

In this part, only main features of the website will be outlined. For further details, hit the website: http://www.gifu-nct.ac.jp/jinbun/mkashimura/website/index.html. On the front page of the website, there are five icons: Test, Education, Practice, More practice, and Scrip with linking rules. Clicking each icon, students can jump to the following pages.

2.1 Test page

Students watch video-clips of eight different people reading the same script aloud and guess if they are native speakers (NSE) or non-native speakers of English (NNSE) based on their accents. Speakers in the video-clips are two Americans, two Italian, a French, a Japanese, a Korean, and a Taiwanese.

Our purpose here is to raise students' awareness of different but intelligible world Englishes. Introducing this page, we told students that all the NNSE had some accents caused by their native languages and that even NSE in the U.S. spoke various Englishes, but they were easily understood. We also told them that it was fine to have an accent and set intelligibility, not a native-like accent, as a goal of pronunciation.

Intelligibility is a practical goal for adults' pronunciation practice. Brown (2000) mentions that based on critical period hypothesis, after around the puberty, it is very hard for adults to acquire native-like accent. Celce-Murcia et al. (1996) also says that teachers need to redefine the goals of the pronunciation class for adults as comfortable intelligibility.
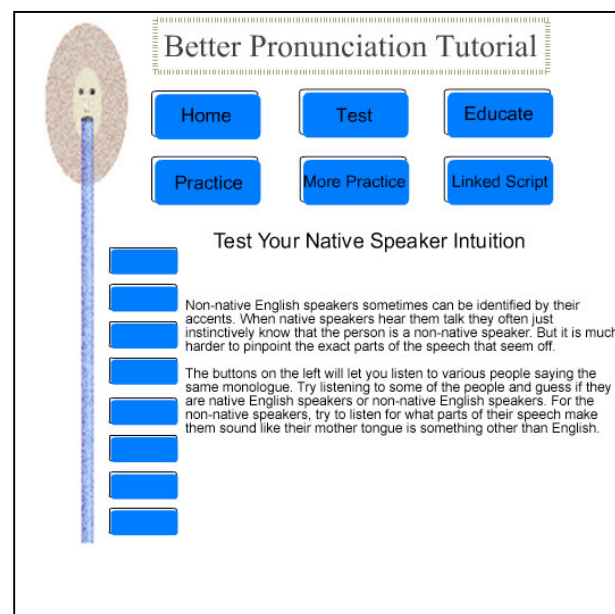
2.2 Educate page

Educate page gives an explanation of all the linking rules.[2] In addition, the deductive explanation was chosen, since this website was potentially targeted for high school and university students, who benefit more from deductive explanation than young children. This is based on the previous study that adults can utilize various deductive processes to shortcut the learning of linguistic concepts (Brown, 2001).
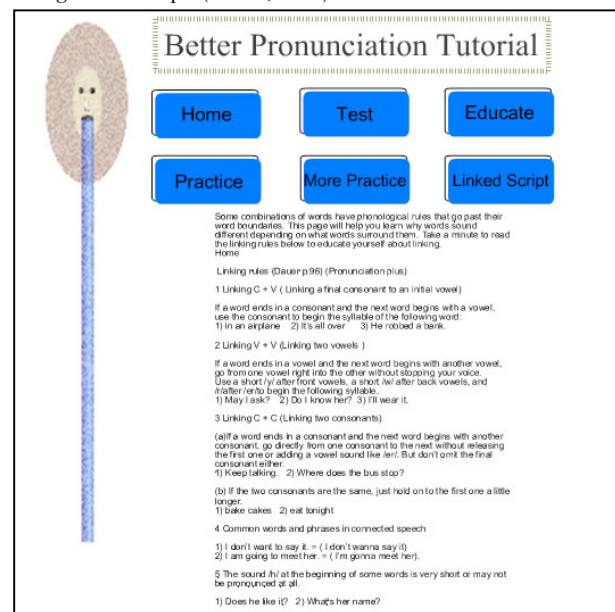

2.3 Practice page

To practice pronunciation, a shadowing technique was selected, because it is a good way of practicing prosody (Torikai et al. 2003). This section has two different types of video-clips. The first ones demonstrate how to do shadowing as an effective way of practicing pronunciation. In the video-clips, an NNSE does shadowing using the same script read in the Test page. The second ones show a pronunciation model of an NSE reading the

same script. This page allows students to choose the video-clips with or without caption of the script and three different speeds: slow, medium, and natural.
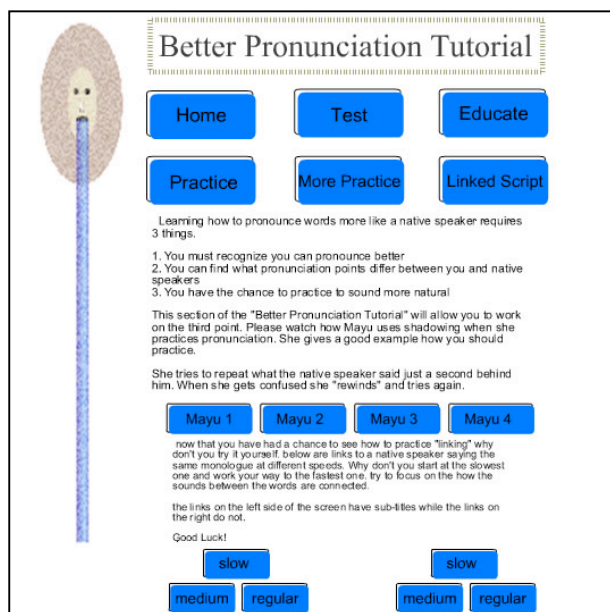

2.4　More Practice page

There is a web-link to Audacity, a free sound-editing software that lets users record their own voices. Audacity makes it possible that students record their voices saying the script and evaluate their own performances. We just introduced students this useful software, hoping that it will be used by them whenever they are willing to use.
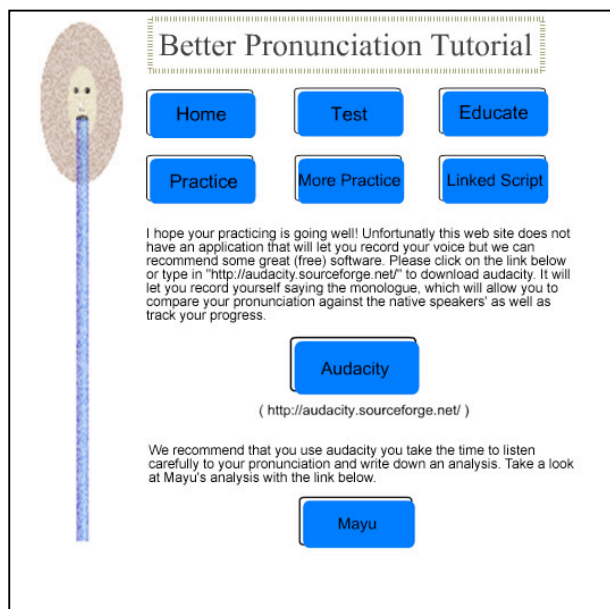
2.5　Script with Linking Rules page

In this page, students see the script with linking rules. The parts where they need link words are shown in green. If they place the cursor on these parts, a pop-up balloon that tells which linking rule is applied to them comes up; if students click them, they hear the model pronunciation. Thus, they have both visual and auditory help to practice the monologue.
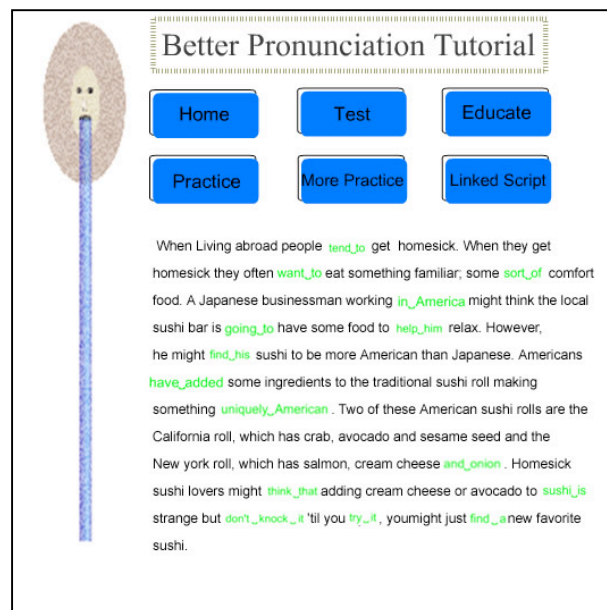
3.　Purpose of the study

After uploading the webpage, we introduced it to our Japanese college students to conduct research on the effectiveness of the website for Japanese college students. As mentioned above, it was created based on various aspects of pronunciation and CALL theories. However, more specifically, we focus on linking and intelligibility, which are often unknown or ignored in Japanese classroom. Therefore, three research questions will be investigated:

1. Does the website help the students to learn pronouncing linking parts accurately?
2. Does the website help the students to improve their intelligibility?
3. What are the technological advantages and disadvantages when the students practice pronunciation by using the website?

4.　The Study
4.1　Participants

The participants are 149 students who enrolled the classes taught by the authors at Tokai University and Gifu National College of Technology. The students had various majors. Some classes met once a week and others met twice a week. All the classes were 90-minute sessions. Concerning students' educational background, the result of the question 1 in the questionnaire (see Appendix 1) shows many students (99 students) started learning English in junior high schools. Besides, most students have no experience living in English speaking countries for more than six months, according to the results of Question 2.

4.2　Materials

The materials for this study consist of the following: a website created by the authors, a questionnaire about English-learning background and pronunciation practice using the website (see Appendix 1), two scripts, Script A (Appendix 2) and B (Appendix 3), which the students read aloud in their recordings, and a self-evaluation sheet for their recordings

(Appendix 4). To make Script A, we used an excerpt about sushi from a textbook used at high schools in Japan. In the script, quite a few parts where the speakers have to link words are intentionally included. Script B, called an applied script, also has linking parts to which the students need to apply linking rules.

4.3　Procedures

First, before the website and linking rules were introduced into the classes, the authors asked all the 149 students to record pronouncing Script A on IC recorders. This is named the first recording. Next, they were given a lecture on how to use the website and an explanation about linking rules. Then, they were asked to study linking rules and practice pronunciation through the website outside of the class for three weeks. 131 out of 149 students turned in their self-study log in which they wrote down for how many minutes they practiced pronunciation each practicing day. The average of the students' self-studying time is 2.58 hours (see Figure 1).
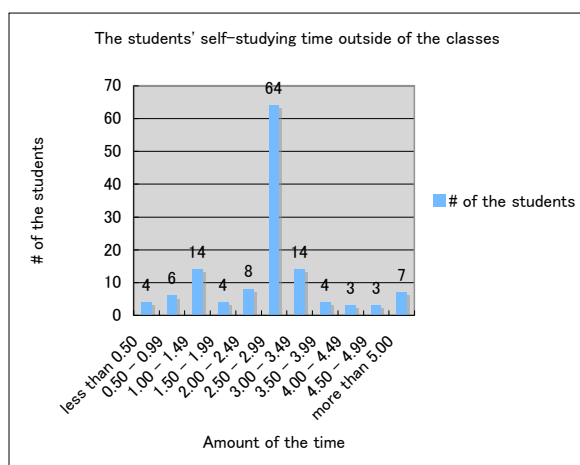
Figure 1: The students' self-studying time outside of the classes

After three weeks, the students made a second recording. They recorded Script A again and a previously unseen script, Script B, as well. They were then asked to listen to their first and second recordings and answer the questionnaire and the self-evaluation sheet.

After all the steps shown above, the authors calculated the mean and standard deviation of the Likert scale questions. As for the open-ended questions, the students' opinions were categorized, and the number of the students in each category was counted.

In addition, the authors analyzed the three recordings made by each student: the students' first recordings, in which they read aloud the Script A; and their second recordings, in which they pronounced the same scrip and Script B. 50 students' speeches out of 149 were randomly selected and evaluated by two NSE raters that the authors had trained.

Then, two different evaluations were conducted. One evaluation was for accuracy. The raters checked whether the students pronounced linking parts accurately in each of the three recordings. To make it simple, six linking parts were selected from Script A and five from Script B. The selected linking parts represent each linking rule shown on the website. The other is evaluation for intelligibility. Using the rubric created by the authors (see Appendix 5,) the raters gave scores to each of the two recordings, in which the students pronounced Script A.

5.　Results

The results of Likert questions in the questionnaire and the self-evaluation sheet, and the raters' evaluations are introduced here. In the Likert questions, the scale ranged from 1, i.e. "I strongly disagree" to 4, i.e. "I strongly agree."

Table 1 shows the students' experience of learning linking rules and using shadowing. 81 % of the students (121 students) had not learned linking rules before taking the classes. On the other hand, almost half of the students declared that they had practiced English pronunciation by using shadowing technique before they took this class.

Question Number*	Yes**	No
4	28	121
5	70	79

Table 1: The Students' experience of learning linking rules and using shadowing

*Question number here corresponds to the question number in Questionnaire shown in Appendix 1
**Number of the students

The students' opinions about the contents of the website are introduced in Table 2. Since the means of Question 12 (2.93) and 13 (2.77) are relatively high, it turns out that user-selectable video-clips are useful for the students to practice pronunciation. Considering the mean of Question 18 (3.01), it seems that many of the students have set a goal of acquiring intelligible English pronunciation.

Statement Number *	Mean	SD
8	2.66	0.69
9	2.34	0.73
10	2.53	0.75
11	2.61	0.79
12	2.93	0.84
13	2.77	0.85
14	2.57	0.81
15	2.61	0.89
16	2.68	0.82
17	2.36	0.79
18	3.01	0.84

Table 2: About the contents of the website

*Question number here corresponds to the question number in Questionnaire shown in Appendix 1.

Table 3 reveals the students opinions about the whole process of pronunciation practice using the website.

| Statement Number	Mean	SD
19	2.56	0.87
20	2.74	0.72
21	2.93	0.72
22	2.76	0.65

Table 3: About the whole process of pronunciation practice using the website

*Statement number here corresponds to the question number in Questionnaire shown in Appendix 1.

Figure 2 shows the raters' evaluation on the students' pronunciation of the selected linking parts in the first and second recordings. In terms of the students' improvement of linking, as shown in Figure 1, the items that most of students pronounced correctly using linking in the second recording are "want to" and "going to." 35% of students pronounced "want to" using linking in the first recording, then 78% of them did so

in the second recording. As for "going to," 2% of students pronounced correctly in the first recording, then 67% of them in the second recording. However, other than these two items, significant improvement cannot be seen.
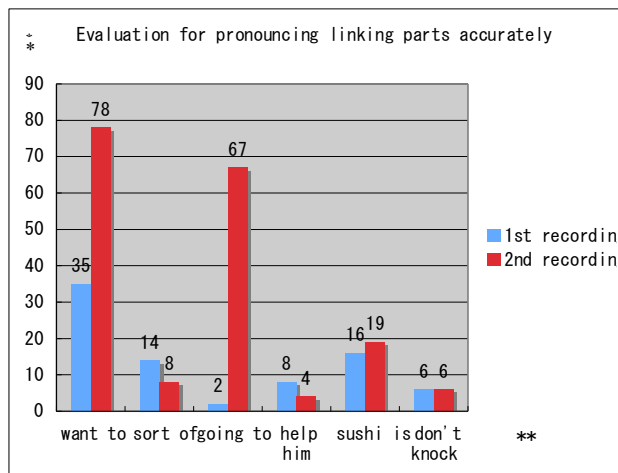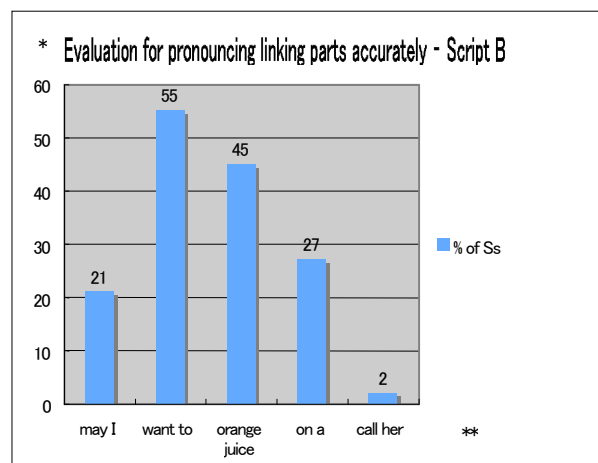

Figure 2: Evaluation for pronouncing linking parts accurately - Script A

* Percentage of the students who pronounced the linking parts accurately
** The target linking parts

Figure 3 presents the raters' evaluation on the students' pronunciation of the selected linking parts in the applied script of the second recordings. Two items, "want to" and "orange juice" in the previously unseen script are pronounced relatively well by many students (55% students for "want to," and 45% students for "orange juice.")

Figure 3: Evaluation for pronouncing linking parts accurately – Script B

* Percentage of the students who pronounced the linking parts accurately
** The target linking parts

Table 5 demonstrates the raters' evaluation on students' intelligibility of the overall pronunciation in the first and second recordings. The average rate of the students' speech intelligibility was 1.94 in the first recording and improved to 2.91 in the second recording.

	1st recording	2nd recording
Rater A	2.4	3.4
Rater B	1.48	2.42
Average of 2 Raters	1.94	2.91

Table 5: Evaluation for intelligibility - Script A

6.   Discussion

6.1   Linking

As shown in the Figure 2 and Figure 3, it appears that students became able to pronounce some linking words correctly but not all of them. However, it should be noted that there might be some linking phrases that are easy for students to remember and pronounce, while others are difficult. Because it is often taught how to pronounce "want to" and "going to" using linking in Japanese classroom, it might be relatively easy for Japanese students to remember these rules. In contrast, the phrases such as "help him," "don't knock," and "call her," which most students were not able to pronounce correctly using linking, might be difficult because they should have dropped the first consonant of the second word.

Moreover, the mean of Question 21 in Table 3, 2.93, and the mean of Question 22, 2.76, demonstrates that the students felt that it was effective for them to learn about linking rules and shadowing technique to practice pronunciation. Considering results in Table 1 above, it can be inferred that since many students had not learned linking rules before, they feel it was more useful to learn about linking rules than shadowing technique.

Furthermore, to a question, "what did you improve in the second recording?" in the self-evaluation, 47 students answered, "I became able to pronounce phrases well using linking rules" and 26 students said, "I came to pay more attention to pronounce phrases using linking rules." Therefore, it appears that students became aware of linking rules through this project.

6.2   Intelligibility

With the results in Table 5, it is clear that students improved their intelligibility after this project. Besides this finding, it appears that a lot of students came to think that intelligibility is important after the project. The means of Question 17 in Table 1 is 2.36, which is the second lowest score, while that of Question 18 is 3.01, which is the highest score among all the questions. That is, many students think it more important to acquire intelligible pronunciation than native-like pronunciation and disagree against the idea of setting native-like accent as their goal of pronunciation.

6.3   Technological advantages and disadvantages

Since the mean of Question 20 in Table 3 is 2.74, most students thought the web-based pronunciation tutorial was effective. Beyond this fact, it will be discussed what students thought were advantages and disadvantages of the website application from their comments to open-ended questions in the questionnaire.

As for the advantages, 60 students answered, "I was able to use the web-based pronunciation tutorial whenever I wanted to," and 16 students mentioned, "It was very easy to use the web-based pronunciation because all I need was accessing the website." Interestingly, 23 students said, "I took my own time to practice what I did not understand and what I needed to practice again and again, playing back the video." It can be inferred that choices of speeds and captions in the videos of an NES helped students take their own time. As shown in Table 2, the mean of Question 12 is 2.93 and that of Question 13 is 2.77. These figures demonstrate that students think choices of speeds and captions were useful.

In contrast, about the disadvantages, 38 students said, "It was annoying to take time for starting up the computer and opening the videos." 10 students mentioned, "I had some technology problems to use the website tutorial." Technology could be burden if students do not know about it well. Low internet speed also could prevent the students from practicing pronunciation effectively with the website.

7. Limitations

First, many means in the questionnaire are close to the neutral response. The questions should have been designed more carefully to measure precisely what advantages and disadvantages the students get by using the website and how their performance changed before and after using the website.

In addition, inter-rater reliability should have been dealt with more carefully. To raise inter-rater reliability, it will be efficient to increase the number of rater and to gather and give them the exactly same guidance.

Furthermore, we should have given the students more guidance about how to use the website so that they could not have technology problems using it at home.

8. Conclusion

Based on what was discussed above, it is concluded that the website seemed to help the students to improve their intelligibility to some extent; it is not asserted strongly that the website helped them to learn pronouncing linking parts accurately although they showed a slight improvement on some linking parts. Moreover, as the technological advantage, it is discovered that the students felt easy to arrange their own time and pace to practice pronunciation because the website was a familiar tool at hand. However, as the disadvantage, some technology problems happened to them.

For the further research, although some students said that they got confidence in their pronunciation, it is not clear if understanding importance of intelligibility is correlated to their confidence in pronunciation. Next time, we would like to ask students if their confidence in their pronunciation is related to learning importance of intelligibility.

Appendices

Appendix 1: Questionnaire

<About your background of learning English>
Please circle the one that best describes your background of learning English.
1. When did you start learning English?
Kindergarten   Elementary school   Junior high school
2. Have you ever lived in English speaking countries?
YES   NO
If you chose YES above, please tell us the following information.
Country: Age: from   to   Period of your stay:
3. Had you ever learned about English pronunciation at schools or other institutions, including cram schools, before you took this class?   YES   NO
4. Had you ever learned about linking rules before you took this class?   YES   NO
5. Have you ever practiced English pronunciation by using shadowing technique before you took this class?   YES   NO
<About your learning environment>

6. Circle the number that best describes how you feel about learning English.
"I like to learn English."
4. I strongly agree.   3. I agree.   2. I disagree.   1. I strongly disagree.
7. How did you access the website? Mark the one that best describes your learning environment.
I used my own PC.
I used my friend's or family's PC.
I used my own PC and a CD-R that contains the contents of the website.
I used a PC at school.
<About the Contents of the Website>
Circle the number that best describes how you feel about the contents of the website.
4. I strongly agree.   3. I agree.   2. I disagree.   1. I strongly disagree.
8. I could understand the linking rules when I studied them by myself outside of the class.
9. I was interested in the content of the script which is about sushi in the U.S.
10. The script fitted to my English level.
11. The video clips of demonstration of shadowing (in which a woman demonstrates shadowing in front of computer) clearly shows how to practice pronunciation by using shadowing techniques.
12. It is useful to have choices of three different speeds (from slow to regular) in the video clips of a native teacher when I practiced pronunciation.
13. It is useful to have choices of caption and non-caption in the video clips of a native teacher when I practiced pronunciation.
14. It is helpful for me to practice pronunciation with not only listening to a native speaker's voice but also watching him in the video clip.
15. It is interesting to listen to a variety of Englishes that people from different countries speak.
16. I became aware of the differences among Englishes that people from different countries speak.
17. It is my goal of English pronunciation to acquire perfect native-like accent.
18. It is more important for me to acquire intelligible English pronunciation than native-like one.
<Reflect on the whole process of pronunciation practice using the website>
Were the following items effective for you to practice pronunciation?
Circle the appropriate number for each response.
4. Very effective   3. Effective   2. Not effective   1. Not at all
19. I would like to learn English pronunciation harder.
20. The web-based pronunciation tutorial
21. Learning linking rules
22. Learning shadowing technique
23. Are there any differences between practicing pronunciation with others in the classroom and alone at home using the website?
24. What were advantages when you used the web-based pronunciation tutorial on the website for pronunciation practice?

25. What were disadvantages when you used the web-based pronunciation tutorial for pronunciation practice?

Appendix 2: Script A (script about Sushi)

When living abroad / people tend to get homesick. When
　　　　　　　　　　　　3.(a) C+C
they get homesick / they often want to eat something
　　　　　　　　　　　　　　4. common phrases
familiar; some sort of comfort food. A Japanese
　　　　　　1. C+V
businessman working in America might think / the local
　　　　　1. C+V
sushi bar is going to have some food / to help him relax.
　　1. C+V / 4. common phrases　　　　5. /h/sound
However, he might find his sushi to be more American
　　　　　　5. /h/ sound　　　2. V+V /r/after /ɚ/
than Japanese. Americans have added some ingredients /
　　　　　　　　　　1.C+V
to the traditional sushi roll / making something uniquely
　　　　　　　　　2. a short /y/ after front vowels
American. Two of these American sushi rolls are the
　　　2. V+V　　　　　　1.C+V
California roll, which has crab, avocado and sesame
　　　　　　　　　2. V+V
seed and the New York roll, which has salmon, cream
1. C+V
cheese and onion. Homesick sushi lovers might think that /
1. C+V　　　　　　　3(b) C+C
adding cream cheese or avocado to sushi is strange, but
　　　　　　1. C+V　　　2.a short /y/ after front vowels
don't knock it 'til you try it. You might just find a new
1. C+V/ 3(b) C+C / 2. a short /y/ after front vowels C+V　　1.C+V
favorite sushi.

Appendix 3: Script B (applied script)

May I ask your order?
V+V　C+C C+V
I want to drink orange juice.
common phrase C+V C+C
Is he in the room?
C+V
Yes, he's sitting on a chair to call her.
　　V+V C+V C+V　　　C+V

Appendix 4: Self-evaluation sheet

<Questions about the whole recordings>
Circle the number that best describes how you feel about the contents of the website.

　　4. I strongly agree.　3. I agree.　2. I disagree.　1. I strongly disagree.

1. After the pronunciation practice using the website, I came to pay more attention to pronouncing words using them.

2. After the pronunciation practice using the website, I became able to pronounce words using linking rules.

3. Compare your first with second recordings. What did you do better/ improve in the second recording? (Think not only linking but also your overall pronunciation.)

4. Listen to the second recording. What should you have practiced more? What should you have been more careful about?

5. What are your objectives about English pronunciation? What do you want to practice more? To what extent do you want to improve English pronunciation?

Appendix 5: Intelligibility rubric

Score	
1	Speech is so halting and fragmentary and has poor flow. There are frequent phonemic errors and foreign stress, rhythm, and intonation patterns. These factors cause the speaker to be **<u>unintelligible</u>**
2	Speech has numerous awkward pauses and poor flow. There are phonemic errors and foreign stress, rhythm, and intonation patterns. These factors cause the speaker to be **<u>occasionally unintelligible</u>**.
3	Speech has some pauses but a more nearly smooth flow. There are some consistent phonemic errors and foreign stress, rhythm, and intonation patterns. But the speaker is **<u>intelligible.</u>**
4	Speech is smooth. There are occasional pronunciation errors. But the speaker is **<u>always intelligible</u>**.

参考文献

Brown, H. D. (2000). *Principles of language learning and teaching.* Second Edition. White Plains: Pearson Education.

Brown, H. D. (2001). *Teaching by principles: And interactive approach to language pedagogy.* Second Edition. White Plains: Pearson Education.

Dauer, R. M. (1993). *Accurate English: A complete course in pronunciation.* Amherst: Prentice Hall Regents.

Egbert, J., & Smith, H. E. (1999). *CALL environments: Research, practice, and critical issues.* Alexandria: Teachers of English to Speakers of Other Languages, Inc.

McNerney, M,. & Mendelsohn, D. (1987). Putting suprasegmentals in their place. *TESL Talk. 17* (1), 132-140

Murcia, C. M. *et al.* (1996). *Teaching pronunciation: A reference for teachers of English to Speakers of Other Languages.* New York: Cambridge University Press.

Torikai, K. *et al.* (2003). *Introduction to Shadowing* [*Hajimete no Shadouingu*]. Tokyo: Gakusyu Kenkyu Sha.