Teaching teachers phonetics: The design and implementation of an asynchronous online English phonetics course

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Abstract. It is axiomatic that one of the chief goals of an applied linguistics program is to instruct teachers in the intricacies of English language structure. Explicit knowledge of the target language can help domestic and international teachers when dealing with adult 2nd language learners. But while most programs offer courses in English grammar, we found a paucity of (online) phonetics classes. We discuss three characteristics to be included in an online phonetics course: the description and learning of the sounds of the world's languages, the technology-based collaborative procedures to narrowly transcribe a wide range of accented English speech, and the specific design to engage a variety of online students. Particular attention is devoted to our unique collaborative online project that at once trains students in the phonetic analysis of non-native speech. The results of these analyses are contributed to the online database, *the speech accent archive* (accent.gmu.edu), thereby giving students ownership of a publicly available online archive. The outcomes are described, with justifications and specific methods for measuring them. This paper emphasizes that learning to narrowly transcribe leads to enhanced listening and analysis, and that peer-to-peer collaboration is vital for any asynchronous online class.

Keywords. phonetics; phonetic transcription; teaching phonetics; foreign accent; collaboration; online instruction

1. Introduction. Distance education courses in the United States are increasing (Seaman et al., 2018). This increase is also the result of the COVID-19 pandemic lockdown that caused educational institutions to shift to online learning. A number of studies discuss how alternative approaches are being integrated for effective online learning, including the advantages and challenges of online learning during the COVID-19 pandemic (Bdair, 2021; Moon, Hargis, & Lu, 2021). Advantages include a more flexible learning environment, improved student academic achievement, and the adoption of self-directed learning (Bdair, 2021). However, challenges of online learning during the COVID-19 pandemic are consistent with those reported during traditional distance learning. This includes student isolation and difficulties with engagement and interaction (Ewing & Cooper, 2021). Indeed, engagement and interaction are two essential keys for students' academic success (Tawfik et al., 2018). In this paper, we discuss a sustainable online phonetics course that we have been offering at George Mason University. It predates the 2020 pandemic as we have been offering it for five years now. Our goal is to assert that a linguistically responsible phonetics course can indeed be taught fully online. We will describe our graduate-level course and focus upon the chief ways in which we enhance student collaboration through narrow phonetic transcription. We also report on some of the technology and tools that we use in this course. Our challenge was to design a theoretical phonetics course for teachers of English as a second language. How could we keep it theoretically phonetic, while making it accessible and useful to students with applied concerns? And how to do this online?

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Our LING 523 course is part of our graduate TESL Certificate program. Essentially, it does what most phonetics courses should do; it covers topics in the articulation of speech sounds, the acoustics of speech sounds, and it stresses the art of narrow phonetic transcription.

In the class we move from a discussion of theoretical knowledge to applied knowledge. And even though we have named this course English Phonetics, there is a reasonable amount of comparative and contrastive work with non-English languages. This, along with an understanding of the sources of second language pronunciation differences, leads to some best practices for teachers who teach non-native speakers.

A major focus in this course is on the narrow transcription of a large variety of native and non-native English speech. For us this achieves two things: It trains the students to become close listeners and analyzers, and it promotes iterative collaboration.

We rely on the data found in *the speech accent archive* (Weinberger, 2018). This is an accessible and growing database of annotated English speech. It currently contains approximately 3,000 samples of native and non-native speakers reading the same English paragraph. Speaker demographics and phonetic transcriptions are included. Our phonetics students contribute to this database through a semester-long project described below.

The non-native speaker (NNS) online collaborative project involves teams of three students. Each team solicits a suitable non-native speaker of English and uses approved field-recording methods to digitally capture the speech. Throughout the semester the speech is narrowly transcribed collaboratively and with the help of speech analysis software, detailed consensus is reached on each transcription. The transcription is analyzed and compared to any native speaker sample, and general phonological differences are noted and given some theoretical attribution. Finally, a pedagogical intervention is proposed. The detailed path of this procedure along with the some of the tools employed is shown in Figure 1.
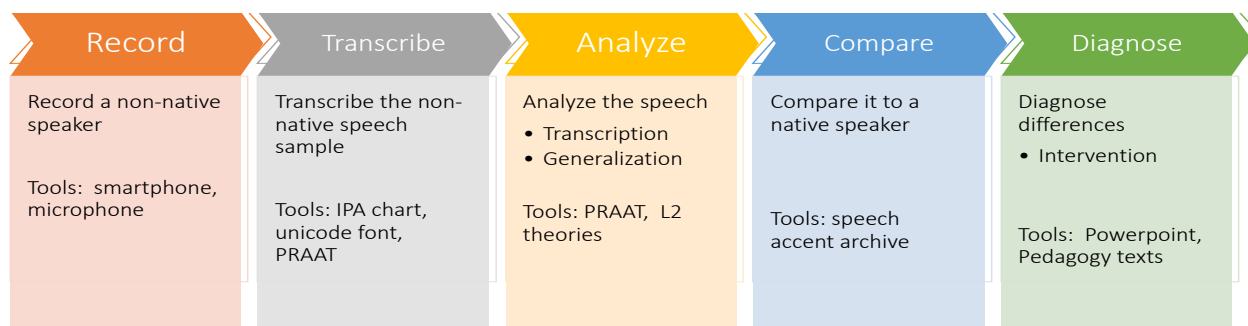
Record	Transcribe	Analyze	Compare	Diagnose
Record a non-native speaker Tools: smartphone, microphone	Transcribe the non-native speech sample Tools: IPA chart, unicode font, PRAAT	Analyze the speech • Transcription • Generalization Tools: PRAAT, L2 theories	Compare it to a native speaker Tools: speech accent archive	Diagnose differences • Intervention Tools: Powerpoint, Pedagogy texts

Figure 1. The NNS online collaborative project lifecycle

2. The transcriptions: the wiki and the discussion board. Parallel to the individual student group projects, the entire class works on one selected non-native speech sample together. For example, a recent class worked on a Mandarin speaker from Shanghai. (Mandarin28 on *the speech accent archive*). This NNS online project relies heavily on transcription and analysis. It draws upon listener's perceptual and linguistic knowledge (Ball, et. al., 2009); so, students are expected to apply the knowledge from the course material in both their transcription and analysis. Additionally, since we view transcription as more of an art than a science, we require students to spend some time practicing and reflecting. This project helps train students to be close listeners. It also requires multiple human listeners to reach consensus on the transcription, which in turn enhances students' collaboration through interaction and engagement in such an online class (Shriberg, et. al.,1987).

Since this course is fully asynchronous, we utilize wikis to transcribe, and enlist the discussion board to continue elaboration on a weekly basis. Accordingly, each week students are assigned a different part of the speech sample to transcribe, with minimal instructions, as can be seen in Figure 2, and they take turns in starting off the transcription so that no one student will always be the first to initiate. Students' transcriptions are followed by the consensus transcription after discussion is completed on the discussion board. This process repeats weekly until the speech sample is fully transcribed.
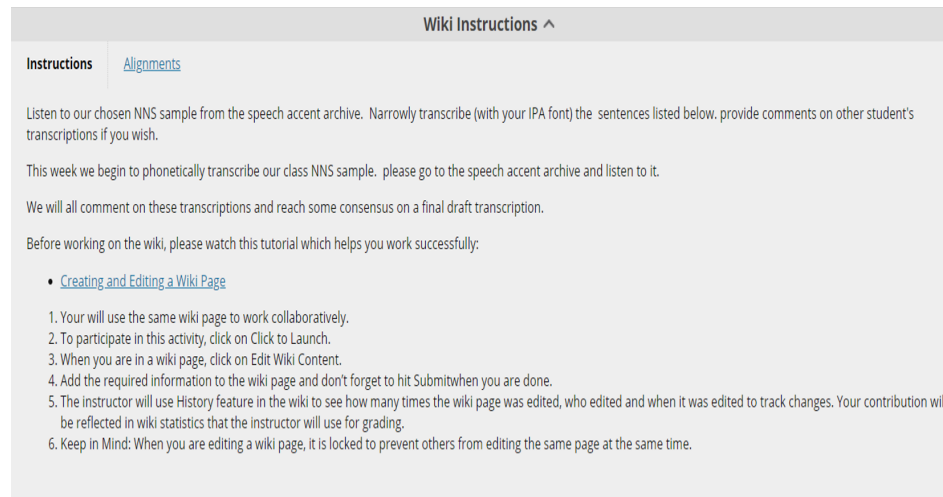
Figure 2. Wiki page instructions

In addition to the weekly wiki transcription task, students are required to discuss their transcriptions for that week and reach a consensus. This is done in the weekly discussion board forum, where students discuss some of the issues they faced and/or reflect on their experience for that week's transcription. It is here that they argue for their particular rendition.

Once the students finish their weekly transcription assignments, we have a complete consensus transcription that students agreed on for the nonnative speech sample, as shown in Figure 3 below. This consensus transcription is used for other tasks in the group project, such as creating a list of phonological generalizations for the speaker of this sample, coming up with theoretical attributions for those generalizations, and developing an intervention plan to remedy some of the speech behaviors.

[pʰəlis kʰalˠ stɛlə‿ æskə hə‿ ʈʷu
bɹɪ̃n d̪is t̃ĩŋs wɪθ hɚ fĩəm d̪ɛ stɔːɹ̩
sɪks pũːns əf fɹɛʃ snoʊ biːs faɪf θɪk
slæps əfu bɹu tʃiːs æ̃m mebi ʌ
snæk̚ fɔɹ hɚ bɹʌd̪ə bap wɪʔ asˤʊ̆
niʔ ɛ smalˠ pʰlæstɪk snek ɛ̃ŋə bik̚
tɔɹ fɹak fɔ d̪ɛ kʰɪts ʃi kæ̃n skoʊp
d̪is t̪ins ĩntu θriː ɹɛː bæks ɔ̃m
w̃ʊ wɪ go mi hɚ wɛ̃nst̪e ɛʈ d̪ɛ
tʃɹeĩn steɪʃɔ̃n]

Figure 3. IPA transcription for the NNS speech sample

3. The software tools. This online course utilizes different technological tools, which include the Standard Blackboard tools (like the discussion board, the wiki, and group designations). We train students in the use of specialized high-quality microphones for field recording on their smartphones, and everyone learns to use speech analysis software like Praat (Boersma & Weenink, 2021). Everyone must use the Unicode font SIL Doulos to make sure all phonetic symbols render correctly. The class also uses *the speech accent archive* for the main database. An online transcription tutorial based upon data from the *archive* is also assigned to students for phonetic transcription practice.

4. Post-course analyses and results. We checked the effectiveness of this online course by comparing the end-of-term standardized student ratings to our traditional phonetics course, and we found very similar results. We also compared students' feedback between traditional and online learning environments. The mean results from a standardized course evaluation here in Figure 4 show that there is no difference between these learning environments. This suggests that that the outcomes were unaffected by delivery method.
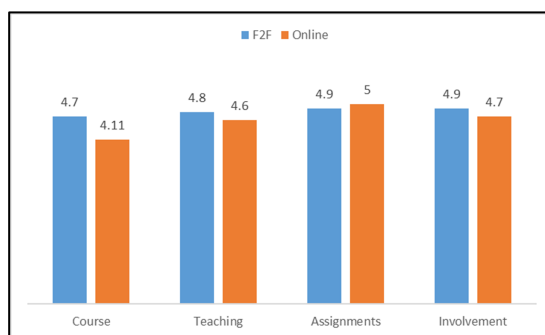

Figure 4. Differences between face-to-face and online courses (0-5 scale)

We also compared students' online interaction to check whether the online environment provided an opportunity for learners to interact with each other. We compared students' interaction, which is the number of messages they posted on the discussion board when they discussed the NNS project's tasks with those from the weekly discussion prompts (see Figure 5). The average

number of messages per a student was higher when students worked on the project's tasks showing an on-going conversation on the task's completion. When we compared students' engagement, which is the number of words each student posted on the discussion board, the results were different. Students wrote longer messages when they answered the weekly discussion prompts than they did on the project's tasks. This shows that the task-oriented project assignment requires shorter messages but more frequent participation. While harder to measure, the overall quality of these discussions was consistently high.
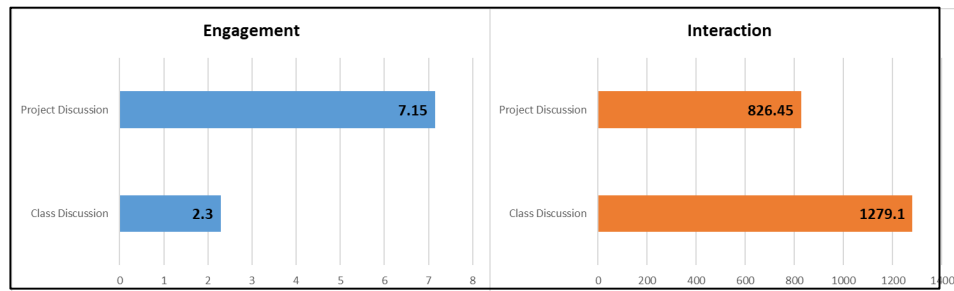
Figure 5. Project vs. general discussion differences

We also collected the qualitative student comments. Below we show some of the typical responses that students shared with us:

Figure 6. Student written feedback about the course

5. Final remarks. In summary, we believe that the structure of our online class and the NNS project have provided three types of interaction that are important for the effective engagement of the students. Namely, we provided: (1) the learner-content interaction through pre-recorded lectures, assigned reading, and assignments; (2) learner-instructor interaction through written feedback, the "ask professor forum", and real-time office hours; and finally (3) learner- learner interaction through collaboration on the NNS project, group presentations, and guided discussion board interactions.

The course peripherally addresses a subset of JEDI issues. Because of the nature of the online class, it welcomes and attracts a diverse population of students, particularly students whose native language is not English. Moreover, the semester project, while privileging native speech, does not overtly choose any one variety of native English pronunciation as the "best" one. As linguists, we try to instill the notion that every variety of language has value.

We believe that our design of an asynchronous course is sustainable and scalable, and the teaching and learning principles can be generalized to other linguistics courses. Although this course was not initially designed as a response to the changes implemented by our institution due to COVID-19, it proves to have an effective design in such circumstances, and many of the course aspects were actually adopted by other faculty in our program.

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