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COMPARING ONLINE VS. FACE-TO-FACE CLASSES: A CASE STUDY OF A FRENCH PRONUNCIATION CLASS

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This study compares the outcome of a traditional face-to-face (F2F) class, taught in the spring of 2012, with its online equivalent, taught in the summer of 2013. Based on comparable assignments, results show that there are mostly no significant differences on written and oral quizzes (except for two oral quizzes) and that the evolution of students is similar in both formats. The lower performance of the online class on these two assignments may be due to the difficulty of the elements included. In these cases, the presence of the instructor as a motivator and a source of immediate feedback seems to be beneficial. In one other oral quiz though, the F2F class performed at the same level as the online class even though it is also a fairly difficult theme (liaisons). It seems, for this assignment, that the option to control one's learning, possible in the online class, was more beneficial than the immediate feedback from the instructor,.

INTRODUCTION

In the past ten years, all levels of education have seen a drastic increase in online classes and learning. A cursory look in The Chronicle of Higher Education gives a plethora of examples showing that, even several years ago, enrollment in online college-level classes is growing much faster than general enrollment in college:

> "From the fall of 2004 to the fall of 2005, the enrollment [in online classes] grew by 36.5 percent. And from the fall of 2005 to the fall of 2006, enrollment increased 9.7 percent. Still, it's growing faster than general college enrollment, which grew by 1.3 percent from 2005 to 2006" (Carnevale 2007).

One of the main consequences of this explosion was a call for quality control and learning assessment. Indeed, in 2012, a supplement of The Chronicle of Higher Education, entitled "Taking Measure of Online Education" was entirely dedicated to this very issue: http://chronicle.com/article/Online-Learning-Supplement-/131624/. Several studies have shown that technology can help students learn language by putting them in control of their learning, by enabling them to collaborate in new ways, and by exposing them to more authentic language (Blake, 2008; Goertler & Winke 2008a; Lancashire 2009). Additionally, they can study in a time frame that is most convenient for them.

The current study adds to this discussion of the effectiveness of online language classes. In particular, it focuses on a phonetics and pronunciation class when most studies focus on general language classes, on grammar, or on writing. The primary goal of this study is to measure whether students in an online class obtained similar results on written and oral

quizzes as those enrolled in a traditional face-to-face (henceforth F2F) class, asking the following research questions:

1. Are the grades on assignments comparable in the F2F class and online class?
2. Is the evolution of the pronunciation of students between the first recording and last one comparable?

Previous studies on online learning

Before delving into the study, it is important to establish definitions. A hybrid class is generally defined as a class containing at least 50% of the content online whereas a class with less than 50% of online content is typically referred to as technology-enhanced. A class with 100% of the content online and with no actual in-person contact is called an online class.

Attempting to review all the studies published on the topic of online learning is well beyond the scope of the current paper. I will only briefly mention some studies (among too many to list here) that relate most to the effectiveness of online learning of a foreign or second language.

Overall effectiveness

Many studies show that learning can and does take place in an online environment, even though Goertler and Winke (2008b) report that many experiments (successful or not) go unreported. They urge more publications of results so that "others can follow in their footsteps but avoid making some of the same mistakes" (Goertler & Winke 2008b, p. 254). Sanders (2005) compared student learning outcomes (as measured by the BYU placement exam) before and after the implementation of a redesigned curriculum that reduced the amount of face-to-face class time and replaced it with various forms of online activities. His results show comparable scores on the placement test for both instructional formats. In addition, he reported that there was no difference in student retention nor in course completion. Since the introduction of this online component allowed for significant savings (in terms of instructor hours as well as student cost), these were overall very positive results. Sagarra and Zapata (2008) reported the positive effect of an online workbook on the results on grammar tests. The 245 Spanish-language students in the study reported enjoying the usefulness and ease of access of the workbook as well as the immediate feedback it provided. Blake (2009) also reported no difference between F2F and online/hybrid classes. Abuseileek (2009), trying to study smaller elements of the overall learning process, compared the acquisition of grammar under four different treatments with computer-based or non-computer-based learning inductively or deductively. His results showed that computer-based technique seemed to facilitate the learning of more complex structures (described as complex sentence structures), especially if associated with a deductive format. Less complex structures did not show a difference across all four treatments.

A recent study, however, qualified these positive results by introducing the variable of class size. Russell and Curtis (2013) compared a small Spanish class (25 students) to a larger one (125 students), both of them taught fully online. Not surprisingly, students in the larger class were less satisfied with their experience than those in the smaller class. In the larger class, there was much less interaction, not only with the instructor, but also among students. They concluded that a larger class created an environment that was less conducive to effective learning than the smaller class. As administrators often see online classes as a money-saving device, this study provides crucial information regarding the limit of the effectiveness of online classes. This is echoed in the high school environment, as reported by Oliver, Kellog, and Patel (2012). High school students enrolled in a virtual public school reported lower satisfaction rates with their experience learning a foreign language than they did for other subjects. In particular, students felt that there was inadequate support and insufficient collaboration among students. These two studies point to one of the most often cited problem with online instruction, namely, the lack of interaction and connection.

Limited interaction

As McBride and Fägersten (2008) point out, students enrolled in online classes reported an increased feeling of isolation, because they found themselves interacting primarily with the computer. Interestingly, this also applied to instructors. A growing number of studies underscore the lack of community (White 2003 and Wildner-Bassett 2008 among many others). In an online class, there is no eye contact, no group work, no arriving to class early to chat with fellow students, and no staying after class to talk to the instructor. For this reason, McBride and Fägersten (2008) underline the importance of a steady stream of communication between instructors and students.

More recently, some have attempted to evaluate and provide solutions to remedy this important issue. Eneau and Develotte (2012) reported that graduate students enrolled in an online Master's program developed ways to connect with other students to achieve a sense of community. They add, however, that this was by no means easy to do. Senior (2010, p. 146) stressed the importance of the instructor in establishing this sense of community and connectivity:

> It has suggested that, regardless of the degree to which their conventional roles are technologically supported or sidelined, language teachers need to find ways of developing and maintaining connections with their students. To do this they need to understand the complexity and dynamic nature of their roles – and be prepared to redefine them where necessary.

This study points to the need to redefine the role of the instructor in online instruction. This conclusion is also found in one of the very few studies focused on online learning of pronunciation. Indeed, Brudermann (2010) reports that there needs to be a structure in place to help students develop a sense of responsibility in front of distance learning and that this falls onto the instructor.

METHODOLOGY
The class

To conduct the present study, a fully online class was compared to its traditional F2F equivalent. The class in question was a third-year French phonetics and pronunciation class, which the author has been teaching almost every semester since 2006. It is required for all French majors and minors at Michigan State University. The F2F class in this study was taught in the spring of 2012 (a 15-week semester) with 20 students enrolled and met twice a week for 1 hour and 20 minutes. The online class was taught in summer of 2013 (a 13-week semester) with only eight students enrolled. It was the first time the class was taught online. Both classes used the same textbook: Violin-Wigent, Miller and Grim (2013). Although the F2F class used a preliminary version of the textbook, there were no significant changes in the content between the two classes. Most students enrolled in class are not primary French major but oftentimes have selected French as their secondary major or as their minor.

In both classes, the type and sequencing of activities were similar. Each lesson starts with listening comprehension activities, which are the bases for the following rule-induction phase, followed by discrimination activities. In the F2F format, this is done at the end of class so as to prepare students to read the actual lesson at home before the next class, as well as prepare a couple of activities. This is then followed by practice activities, starting with oral practice (repeating after the instructor or audio files) and transcription activities. Students enrolled in the online class where strongly encouraged to follow this sequencing to optimize their learning. The rationale behind the sequencing of activities (pre-reading activities before reading the lesson, importance of the inductive approach, focus of oral tasks) was given to both classes. The F2F class typically contains only one or two group activities per day, during which students discuss each other's homework before correcting as a class. This was eliminated in the online class.

The tasks

The study is based on the grades students received in the class for written and oral quizzes. The F2F class was given a total of nine oral assignments but only seven are included in the study as they are the ones that are identical for both classes. These oral assignments were short authentic texts (between 93 and 130 words) that students were asked to read aloud and record using Audacity. Though 20 students were enrolled in the F2F class, the results presented in Table 3 below do not always contain 20 students, as several assignments were not turned in. By comparison, all students completed all the oral assignments in the online class. In both classes, oral quizzes were assigned after extensive practice that provided students with models and feedback. In the F2F class, feedback was immediate after all students repeated after the instructor in class, whereas the online class received delayed feedback after oral homework but individualized feedback as the instructor provided a personal list of problems to each student.

Three written tests were included in the study. These are obviously different written tests for both conditions to prevent cheating. However, they all followed the same format

starting with a phonetic discrimination asking students to recognize the sound they heard, followed by theoretical questions (such as definitions, identifications, etc.), and ending with IPA transcription. For the first test, the transcription section involved reading in the IPA and writing using the normal orthographic alphabet whereas for the next two tests, students had to transcribe a series of short sentences using the IPA.

Statistical analysis

To analyze the results, a series of t-tests were run on the tasks described above . Results below do not reflect the Bonferroni adjustment even though, technically, it should be included when one runs a series of t-tests. The Bonferroni adjustment would dictate that the p values would have to be under .007 to show a statistical difference between the F2F and online classes. Since none of the p-values are that low, it was decided not to include the Bonferroni adjustment in order to see some tendencies, with the understanding that analyses and conclusions will be tentative and prudent.

RESULTS
Comparison of overall results

Table 1 below shows how many students received what final grade in each of the classes. As a reminder, there were 20 students in the F2F class and eight in the online class.

Table 1
Overall grade distribution

	F2F		Online	
2 (C)	2	10%	1	12.5%
2.5 (C+)	5	25%	1	12.5%
3 (B)	2	10%	1	12.5%
3.5 (B+)	3	15%	2	25%
4 (A)	8	40%	3	37.5%

Table 1 shows a similar spread in the fact that no one earned less that than a grade of 2 or C. Additionally, the proportion of students earning this lowest grade is comparable in both format, just like the proportion of students who earned the highest grade (4 or A). The major difference between the two classes can be seen in the distribution of students in the middle grades. As can be seen, there is a higher percentage of 3.5 (B+) in the online format and a higher percentage of 2.5 (C+) in the F2F class. Since there is such a small number of students in the online class, it is difficult to come to definite conclusions. We can, however, hypothesize that the online format may have attracted more conscientious students or students who are better at time management and that the results are not due to the format itself but rather to a self-selected population. Additionally, since the online class was taught in the summer, it could be the case that students were not enrolled in other classes and, therefore, had more mental energy to devote to the class.

Comparison of 3 written quizzes

In order to answer the first research question, we will first look at the results of written quizzes before moving on to oral quizzes.

Table 2
Comparison of written quizzes

	F2F Mean (SD), n = 20	Online Mean (SD), n = 8	Are grades comparable?
Written Q 1	M = 86.80 (SD = 7.01)	M = 79.13 (SD = 14.11)	t(1.8,42) = 1.47, **p = .179**
Written Q 2	M = 83.85 (SD = 12.56)	M = 85.94 (SD = 7.02)	t(1,26) = -.44, **p = .664**
Written Q 3	M = 83.30 (SD = 6.29)	M = 76.5 (SD = 14.26)	t(1,8.74) = 1.27, **p = .236**

As mentioned earlier, written quizzes were not the same tests so conclusions have to be tentative. The content of written quiz 3 is relatively similar in both conditions, however, since it is a final test that the instructor keeps and re-uses. It is about 75% similar with the exact same sections on discrimination and transcription. Results in Table 2 show no significant difference between the online class and the F2F class on any of the written quizzes.

Comparison of 7 oral quizzes

Table 3
Comparison of oral quizzes

	F2F Mean (SD)	Online Mean (SD) n = 8	Are grades comparable?
Oral Q 1	M = 83.85 (SD = 7.82), n = 17	M = 83.39 (SD = 5.66)	t(1,23) = .178, **p = .860**
Oral Q 2	M = 90.67 (SD = 4.58), n = 15	M = 86.38 (SD = 6.00)	t(1,21) = 1.92, **p = .068**
Oral Q 3 *	M = 88.94 (SD = 6.38), n = 19	M = 88.63 (SD = 3.85)	t(1,25) = .132, **p = .896**
Oral Q 4	M = 91.47 (SD = 4.39), n = 19	M = 86.00 (SD = 5.01)	t(1,25) = 2.84, **p = .009**
Oral Q 5*	M = 90.75 (SD = 5.00), n = 16	M = 84.43 (SD = 6.70)	t(1,22) = 2.60, **p = .016**
Oral Q 6*	M = 81.80 (SD = 78.25), n = 15	M = 78.25 (SD = 8.56)	t(1,21) = .686, **p = .500**
Oral Q 7	M = 88.01 (SD = 6.29), n = 17	M = 83.96 (SD = 6.52)	t(1,13.05) = 1.48, **p = .164**

Oral quizzes 3, 5, and 6, violated the assumption of normality as measured by the Shapiro-Wilk test: oral quiz 3 was not normal for the F2F class (p = .027); oral quiz 5 was not normal for the online class (p = .017); and oral quiz 6 was not normal for the F2F class (p < .001). For this reason, non-parametric tests were run for these three quizzes. Results are presented in Table 4.

Table 4
Non-parametric tests

Null Hypothesis	Test	Sig.	Decision
The distribution of OQ3 is the same across categories of Group.	Independent-Samples Mann-Whitney U Test	**.856**	Retain the null hypothesis.
The distribution of OQ5 is the same across categories of Group.	Independent-Samples Mann-Whitney U Test	**.027**	Reject the null hypothesis.
The distribution of OQ6 is the same across categories of Group.	Independent-Samples Mann-Whitney U Test	**.325**	Retain the null hypothesis.

As can be seen from Tables 3 and 4, only two oral quizzes showed a significant difference between both classes, namely oral quiz 4 (p = .009 in Table 3) and oral quiz 5 (p = .027 in Table 4).

Comparison of the evolution

To answer the second research question on the evolution of the pronunciation of the students and to gauge whether students in both conditions showed similar improvement, results on the first and last oral quizzes were compared. As mentioned above, only the students who turned in all seven recordings were included in this analysis. Results are presented in Table 5.

Table 5
Comparison of the evolution

	F2F Mean (SD), n = 17	Online Mean (SD), n = 8	Are grades comparable?
Oral Q 1	M = 83.85 (SD = 7.82)	M = 83.39 (SD = 5.66)	t(1,23) = .178, **p = .860**
Oral Q 7	M = 88.01 (SD = 6.29)	M = 83.96 (SD = 6.52)	t(1,13.05) = 1.48, **p = .164**
Difference	M = 4.16 (SD = 5.26)	M = .58 (SD = 3.68)	t(1,23) = 1.73, **p = .097**

The first two rows in this table are identical to those in Table 3. From there, the third row presents the difference between the two classes, with the conclusion that the difference is not significant (p = .097). In addition, to see the trajectory of students over the span of all seven assignments, the following figure presents the means for all seven oral quizzes given in Table 3. The two oral quizzes that were found to be significant are shown with an asterisk.

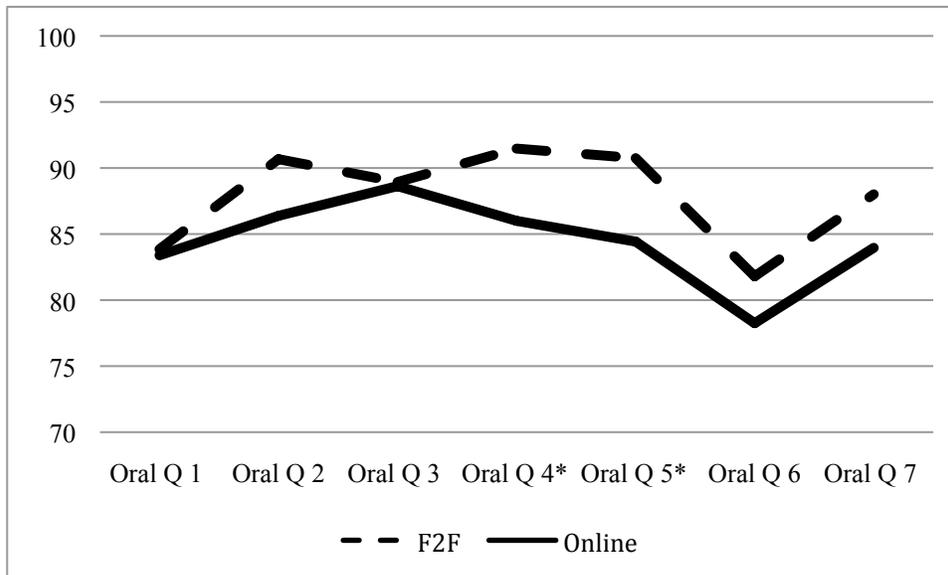Figure 1
Trajectory of student grades

Figure 1 shows similar trajectories for both classes. The means for the online class are almost always lower, except for the first assignment, which helps us be confident that both groups of students were comparable at the beginning of the semester. As mentioned above, for oral quizzes 4 and 5, the online class received significantly lower grades. A discussion of the similar results for oral quiz 3 is presented in the following section.

DISCUSSION

As a reminder, the following research questions were asked:
1. Are the grades on assignments comparable in the F2F class and online class?
2. Is the evolution of the pronunciation of students between the first recording and last one comparable?
The first two sections below will provide an answer to the first research question and the third section to the second question.

Written quizzes

As seen in Table 2, there was no significant difference on written quizzes between the F2F and the online classes. However, since these were not identical tests (except for most

of the third test), conclusions have to be tentative. What we must cautiously recognize, however, is the possibility that learners performed in similar fashion on written tests regardless of the format of the class.

Oral quizzes

The exact same oral assignments were given to both classes so we can analyze the results provided in Tables 3 and 4 with more confidence. These two tables show a significant difference on two of the seven assignments given. Oral quiz 4 showed that the online class performed significantly lower than the F2F class. This quiz covered nasal vowels, which are perceptually and articulatorily difficult for students. They typically struggle to perceive the difference between [õ] and [ɑ̃], and to produce an accurate [ɑ̃], which they tend to realize as a front vowel.

Oral quiz 5 was probably the most difficult assignment during the entire semester as it included both schwas (which are both conceptually and articulatorily difficult) and liquids (articulatorily difficult). Schwas are quite complex in French phonetics as they are governed by rules that seems arbitrary and unpredictable to students. In addition, the type of input that they were exposed to through teacher talk tends to produce more schwas than natural speech. As the class in general, and this assignment in particular, stressed a less formal and more natural style of speech, students tended to have trouble shedding habits of pronouncing schwas they have heard for years. Some students over my years of teaching of teaching this class have told me that they know the rules and understand them, but they just cannot stop themselves from saying the schwas they should not pronounce. In addition to this, oral quiz 5 included liquids. It is a well-known fact that most English-speaking students have trouble with the French /r/ sound. Having to focus on two complex items in one quiz may help explain why students in the online class performed at a significantly lower level than those in the F2F class.

It seemed that this difference may be due to the type of feedback that each class received. Sagarra and Zapata (2008, p. 219) reported that "when asked what they liked the most about the online workbook, participants responded that they enjoyed (…) receiving individualized immediate feedback" among other things. This was possible in the online format (but not for the F2F) for written activities, but impossible for oral ones since feedback, though personalized, was delayed. For F2F oral activities, feedback was immediate but not individualized so as to be less face-threatening. Sheen (2010, p. 225) claimed that the timing was not crucial and concluded that

> the crucial factor that influences the effectiveness of C[orrective] F[eedback] is the explicitness of the feedback (i.e., whether its corrective force is clear). (…) What is crucial is not whether the CF is on-line or offline but whether it is explicit. In other words, the current study suggests that it may not matter whether the CF is provided immediately or is delayed as long as it is noticeable.

Since both formats received feedback, the immediate feedback that students in the F2F class seem to enhance accuracy in production, at least for the more complex themes. By

contrast, personalized feedback, as provided to the online class, may not be as effective because of the delay in receiving the feedback. By receiving immediate and explicit (positive or negative) feedback, students may be more able to notice the difference between their production and the model, hence making the corrections more salient and more meaningful, and ultimately more useful, than those receiving delayed feedback. This seems to contradict Metcalfe, Kornell and Finn (2009) for whom delayed feedback produced better performance than did immediate feedback but their study focused on a radically different skill of vocabulary learning.

Evolution through the semester

As we have seen , there was no statistical difference between the two classes in the overall improvement from oral quiz 1 to oral quiz 7. In addition, both classes show similar trajectories in their evolution of French pronunciation over the course of the semester. In Figure 1, we notice one exception to otherwise fairly parallel lines: for oral quiz 3, the F2F line shows a small dip that we do not see in the online class. This dip reflects means scores that are almost identical: 88.94 for the F2F class vs. 88.63 for the online class. The phonetic theme covered in this oral quiz is liaison, a theme that I deem the most complex in the semester and to which three entire classes are devoted. By comparison, schwas are studied over the course of two class periods. As we have seen, the oral quiz with schwas (and liquids) shows a significantly higher performance by the F2F class, a result which was explained in part by the difficulty of the theme and the type of feedback. It, therefore, seems all the more surprising that we do not see the same pattern with liaison. In fact, it could be the case that, in the case of liaison, immediate feedback (most of which is negative feedback followed by a repetition of the rule) is counter-productive to learning. Indeed, in class, students often seem overwhelmed by their perceived inability to achieve a correct result and look like they tune out. By contrast, students in the online class have control over their learning, reviewing rules when they feel they need it, retrieving feedback on their own time rather than being forced to get it from the instructor in class. This may allow them more time to process the material as well as make a deeper connection with the material.

CONCLUSION AND QUALITATIVE PERSPECTIVES

Overall, the comparison between the F2F and the online class shows rather positive results. In other words, the online class is not significantly lower than the F2F class on all but two assignments. It even seems to have an advantage over the F2F class for one oral assignment. These results, however, can be disappointing for the instructor when the instructor's time commitment is factored in. Not only did it take a very large amount of time to develop this online class, but the amount of time spent on grading is also much higher than in the F2F class, partly because of the increased difficulty of working with IPA symbols on a keyboard and partly because of the focus on individualized feedback. Students often seem to have the perception that an online class is easier and less-work intensive than a F2F class. Some administrators and instructors may also think that, since everything is computer graded, larger class sizes are warranted. While these might be true in some cases, it was not the experience of this instructor. Although activities can be re-

used for future classes (with minor changes at most), the amount of time for grading is not likely to be radically different, if the instructor wants to keep the integrity of the student experience. Indeed, when the online class was taught again during the summer of 2014, the maximum enrollment was set at 20 (instead of 26 for the F2F class).

In spite of the focus on individualized feedback and the fairly positive results, students enrolled in the online class seemed to think that the online format was not as good as a F2F class. The following three quotes come from a questionnaire given mid-semester and at the end of the semester to online students. They provide insights on the perceptions of the class and reflect one of the problems that other researchers have observed, namely the lack of connection and social community. They are another reason why the results of this study were deemed to be 'rather positive' instead of 'positive'.

> "I feel like my speaking didn't develop as well as it could have. I skyped with the professor when I had questions and that was helpful but I don't think my speaking improved very much from chapter to chapter. If I was practicing more regularly and hearing the professor and other students speak in a classroom setting I think I would have absorbed more."

> "I missed having fellow students to work with and just commiserate. There's something about being able to roll one's eyes together when you're reminded about a quiz or asking each other what you got on a test that feels vital to me. I guess I just missed the social dimension of the classroom."

> "I feel that it would have been very beneficial to me to have seen or heard other students and their progress as well."

These comments point to the importance of developing a sense of community and connectivity as discussed earlier. Group work was eliminated from the online class compared to the F2F class, but this may have been a mistake. Instead, requiring students to use tools such as Skype, Facebook or Google Hangouts to connect with each other on guided activities may be beneficial.

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