**LEYSIN AMERICAN SCHOOL
EDUCATIONAL RESEARCH**

Teaching with Duolingo

Paul Magnuson

Introduction

Duolingo launched in June 2012. It is a gamified platform for learning foreign languages. It consists of two major components: grammar and vocabulary exercises and an interface to translate articles from the web. The finished Duolingo translations are the combined effort of many individual students, who do them for free. The company's revenue comes from selling some of these translated articles to clients.

Interestingly, the lessons for newly introduced languages are now created by volunteers. Though the company undoubtedly has a core of perhaps several dozen employees, a great deal of the "work" is done by free by the users, including both the grammar and vocabulary exercises as well as the translations.

Duolingo is not built as a learning management system for teachers of foreign languages to use with students, but there is obvious utility to foreign language teachers when a product is free, gamified, set up to allow one user to friend another, and comes with a discussion board for grammar and vocabulary questions.

In Fall 2014 I began using Duolingo with a class of high school students. This article records my experience it with Duoling during the first semester - as well as recommending to Duolingo what could be addressed by the folks at Duolingo if they want to create a better tool for the teacher in a classroom context.

Personal Use of Duolingo

I created a Duolingo account on January 10, 2013, two years ago.

I began with languages most familiar to me, German, French, and Spanish, but relatively quickly added Italian and Portuguese. I didn't add Dutch until July 2014, then added Danish, Irish, and Swedish during the first semester I used Duolingo with students, in Fall 2014.

I have reached the maximum level (25) in German, French and Spanish, but the program doesn't make one stop. It is always possible to review grammar and vocabulary and always an option to translate articles from these languages into English. I have finished the grammar exercises in Dutch (15), Italian (19), Portuguese (23), and Swedish (13). I will finish the grammar exercises in Danish (11) in the next several weeks. Irish (7) is a whole 'nother story. *Gaeilge* is difficult.

By no means do I speak these languages, and ones that I do speak to some degree are not in general due to Duolingo. However, I have found that I can enjoy posts on social media, newspaper articles, and excerpts from novels in the languages for which I've finished the grammar and vocabulary exercises offered in Duolingo.

In my top five Duolingo languages I've done a fair amount of translating, reaching from level 6 to level 8 in each of them. Duolingo grants a translating level for every 100 sentences you have translated which have also been given the thumbs up by another Duolingo user - that other user must have clicked the "Looks good" button for your translation to earn a point. Level 6 represents than 500-599 sentences that other users thought correct (but a "sentence" can be a single word or short phrase, for example the header of a section of an article).

I've taken the final progress quiz in all languages for which I've finished the grammar and vocabulary exercises. They are not benchmarked with any familiar language test as far as I know, but the rank order of the quiz results accurately reflects how I would self-report my reading ability in each of the languages.

I'm currently on a streak of over 400 days in a row of at least some language learning with Duolingo daily.

School and Classroom Context

I work at an international boarding school in Switzerland. The student body of 330 students spans eighth to twelfth grade and 40 native languages. Most students speak two or more languages. Most students are non-native English speakers. The schedule follows a seven period day, classes meet four times weekly due to block classes on two days and, during ski season, two afternoons off each week for sliding down the local mountain.

The class in which I introduced Duolingo is called Linguistics & Languages. It is an elective, offered for the first time this school year as part of our research school-within-a-school. It is in fact half of our research center's hack school initiative, in which we give students an environment of cool stuff (the other class is robotics and coding) and time to experiment and find their own intrinsic motivation and personal methods to learn best. We are intentionally setting the students up to "hack" their own education.[1]

The class began and ended the fall semester with 16 students, 6 girls and 10 boys, grades 10 to 12. Native languages included Chinese (4), English (3), Portuguese (2), Russian (2), Arabic (1), French (1) Italian (1). Kazakh (1), Spanish (1). Adults from the school were invited to attend as well. Two adults attended regularly, two or three others came from time to time. Their role was to learn language independently for their own enjoyment. Two of them used Duolingo. All of them were native speakers of English.

Two major projects

The students in Linguistics & Languages were asked to take part in two major activities.

All students were required to use Duolingo to begin or to continue learning a language (or more than one language) on their own. They were often given time in class, particularly in the first half of the semester. For those for whom Duolingo wasn't interesting, I created a process to allow any student to research a different online language learning tool, present the tool to class, and then use the new tool exclusively or in conjunction with Duolingo. During the first semester, only one student moved away from Duolingo.

---

[1] A student in the coding activity signed up because the name led him to believe we would be illegally hacking into computers. When he found out no illegal activity was planned, his face registered deep disappointment.

The second major product is the creation of a book called "Language Awareness." The book is composed of two major sections. One section is a review of online language learning sites, using the same template that students can use to move away from Duolingo. The goal is to have twelve good reviews in the book.

The other section is a collection of activities to raise awareness about language, serving as an introduction to the study of linguistics. Students help finish activities I have started for them, and with time, students will initiate and create activities from the beginning. They work in groups of four using a specialized approach to project based learning (see below), piloting the activity after approximately three classes of work time. This "beta testing" occurs either within the Linguistics & Languages class or with another language class on campus. The goal is to have twelve to sixteen activities in the book.

Sample activities, and the linguistic topic they introduce, are in Table 1.

TABLE 1: Some sample language awareness activities

Activity ...	... serving as an introduction to
What does "the" mean?	Translatability
Introduction to Arabic writing	Writing systems
The first word	Origins of language
Basic word order	Syntax
Formal and informal "You"	Sociolinguistics

The connection between the two projects

As I work on languages with Duolingo, I notice now and again something interesting about how a particular language works. These "noticings" are one source for new ideas for the language awareness activities. An overarching goal for the class is that students begin to "notice" what they haven't noticed before as well, perhaps leading to self-initiated ideas for new language awareness activities. I'd like to think I'm providing an environment in which they can develop an inquisitive stance toward language, and toward learning in general.

Project Based Learning

A complementary piece of action research that was not part of the original plan arose from the need to structure the group work on the reviews for online language learning and the language

awareness activities. With the advice and help of colleagues from our school's IT office and research center, I began using ideas from eduScrum.[2] The Dutch developers of eduScrum would no doubt say I have far to go before I can say I'm *doing* eduScrum. For our purposes here, it suffices to say that I'm supporting self-driven student group work with what I understand at the moment as their process. This has become a research project in itself and a colleague and I will address it in the future.

Grading

Each week the students received a pass (4.0) or no pass (0.0). There were 12 total graded weeks in the first semester. The final grade was an average of the passes and no passes.

I did not fix a required number of earned points to reach a certain grade (more on this below), but I did require adequate progress from each student each week. I frequently communicated with students using the activity stream in Duolingo itself, giving encouragement and commenting when I could in the languages the students were learning. I also emailed reminders when I felt a student was not doing enough, or if a student was manipulating Duolingo in a manner to get lots of points but sidestepping serious learning (more on that below, too).

I did not require that students stick with a particular language. They were free to work on any language, or language pair, since Duolingo is based on translating from one language to another. Students could work from their native language to another language, or from English to another language, even if their native language was a third language. Thus, a Chinese speaker might be learning French through English, while her colleague was learning French through English as a native speaker of English. This discrepancy explains in part my unwillingness to fix a certain point total for a grade - any one point total can represent significantly different amounts of effort depending on the student.

Student use of Duolingo

During class

I offered time to work independently at least 50 percent of class time in the first half of the semester, and then increasingly less once the students were working in teams on either the online language reviews or the language awareness activities. Once those projects were underway, in class time for Duolingo was generally limited to:

- times when teams finished their work early;
- days on which I evaluated projects with each of the four teams - the three teams not being evaluated had time for Duolingo;
- a class day or two between projects; and

---

[2] See eduScrum.nl/en

- as the emergency plan for a substitute teacher, which I didn't use.

As homework

Whether or not there was time to work on Duolingo in class, adequate progress (determined by me subjectively, by individual student), was required weekly. I had thought, apparently incorrectly, that students would be more readily intrigued by Duolingo than they were, and because it is so easy to access for short bits of learning, that students would register at least a few points most days.

Instead, when I offered time in class, I saw less attention to Duolingo outside of class, and probably the reverse was also true: if a student logged points outside of class, the effective time on task during any independent class time was probably less.

As an instrument to teach self motivation

By the end of the semester, if a visitor to class had asked the students what the principal and secondary goals of the class were, almost all students would have answered:

(1) to learn to be self-directed learners, and (secondarily)
(2) to learn something about languages and linguistics.

I started the semester modeling my own interest in learning with Duolingo by being at my laptop, at a student table, learning, when the students arrived. Without my active monitoring, a significant number of students spent a significant amount of time online … but not on task. I tolerated this behavior far longer than I would have if the goal of the class was anything but learning to be self-directed learners, because the amount of wasted time - at least, time not spent on learning language via Duolingo or any other online platform - was large. While I felt that the students would need to be free to waste a certain amount of time in order to learn how it felt to be productive, over the course of the semester I grew less patient waiting for intrinsic motivation to kick in.

Perhaps the students were having time to learn intrinsic motivation, perhaps they needed better scaffolding from me. Perhaps I had set my expectations for them unrealistically high - or more probably I just have much still to learn about the blended classroom environment I am trying to build with Duolingo and online language learning in general.

Indeed, that is one reason to share my semester with you and others via this paper.

As an addition to a traditional curriculum

Students in the Linguistics & Languages class responded to questions from time to time in a personal journal. Toward the end of the semester, I asked if they thought that an online learning

platform should be used as a complement in our traditional language classes. Fourteen of 16 students responded to the prompt: 11 said yes, two were noncommittal, one said no.

Developing independence, self-pacing.

A bilingual student studying advanced French wrote:

"I think this way of learning could sometimes be even better than being taught by a teacher all class. It gives the student independence and some may learn more by themselves than in class with other students and a teacher."

A bilingual friend agreed:

"Self-learning is important for self growing, being more independently. … It is a training for them, preparing them to college."

And a third notes that independent work allows students to work at their appropriate level:

"Another point is that the entire class may allow those who can advance easier to go further and learn more."

Additional time on task

Self-pacing is related to having additional time to practice. In class, not having to wait for less advanced students may erode time on task for advanced students. Out of class, simply having access to another way to get more practice should have a positive effect on learning.

"As an example let's take myself. I learn French at [school] but I also do it on DL. Duolingo somehow improves my skills, maybe because I have more practice."

Interest and motivation

Further, having additional ways to access modern language learning supports learning by providing novelty, which plays into learner interest and motivation. Just the fact that the learning is online may be enough to peak the interest of some students:

"And like the word 'online' should be more interesting to students."

One student felt that online learning was more interactive than classroom instruction, but note the counterpoint provided by the one student who thought adding online learning to classes was not a good idea (see Counterpoint below):

"... online curriculum can help improve the students way of learning in that it will make it more interactive, something less dull."

Teacher monitoring

Finally, one student approached her answer from the teacher viewpoint as well, noting that:

"... this is a way for the teacher to monitor progress in a class."

And in the spirit of the comments about independent learning, we might want to add that it is a way for students to monitor their own progress.

Counterpoint

One student was not in favor of adding an online component to traditional classes (though he may have understood the prompt differently than the other students, answering instead whether or not it was a good idea to replace a traditional course with an online course, rather than complementing a traditional course with an online component).

"No … I believe this because the best practice is when you practice in the real world so if you make online courses required then there will be less time for real world practice."

It would be interesting to tease out what "real world" practice means, since one could argue that any classroom context is not the real world, but that some classroom activities and materials try very hard to emulate real world situations, where online learning may not. On the other hand, online learning platforms may also try to emulate the real world, depending on the design of the program.

I had an opportunity to introduce Duolingo for a few weeks when I filled in as a substitute Spanish teacher for two weeks. Some students liked it, others less so. I particularly enjoyed learning from the roommate of one of the students in the Spanish class, that the student was hooked on Duolingo - for German.

While one teacher (of five) in our modern world language department encourages Duolingo currently, the other four do not, and two of them seemed quite unconvinced of its utility. One teacher expressed hesitation for using an online tool that felt like it might, to some extent, replace the teacher.

Progress in Duolingo

One obvious, but unreliable, way for a teacher to measure student progress in Duolingo is by accumulated point totals.

Table 3 shows the total point scores over 14 weeks for the 16 students enrolled in the class. Eliminating the highest and lowest scores (see the notes under the table as to why), the

average point total is 4161, of which six scores are higher and 9 scores are lower. You could imagine that a score near 4161 might be near the average letter grade for our school (a B), with As and Cs perhaps on either side.

TABLE 3: Duolingo point totals for 16 students in one semester (14 class weeks)

Student	1*	2	3	4	5	6	7	8
Total	15335	8955	8115	7695	4901	4293	4166	3955
Student	9	10	11	12	13	14	15	16**
Total	3896	2747	2075	1949	1844	1831	1828	457

*Student often deleted a specific language course and re-tested out of multiple skills again - in his native language - adding artificially to his point total

**Student switched to Fluencia early in the semester.

This turns out to be too simplistic, however. The amount of effort expended, and presumably the amount learned, by Student 2 for his 8,955 points compared to Student 12 with his 1,949 points is not equivalent. Knowing just a little of their backgrounds - and a little about how Duolingo works - highlights how slippery these point totals are.

Student 2 is a native-like speaker of English and at least two European languages. Student 12 is a native Chinese speaker and a low-intermediate ESL student.

In Duolingo, there are options to learn many European languages as an English speaker. For Chinese native speakers the only option is English.

Student 2 earned points in Spanish, Italian and French. Two of these languages are native or native-like for him, in the third he is at an advanced level. He likely tested out of several language lessons, earning many points in one 10 to 15 minute session.

Student 12 earned points in French and English. To learn French, he had to work with the language pair English-French. He is a pure beginner in French. He had no way to test out of lessons to earn points quickly, and each individual lesson was probably quite difficult.

At the end of the semester, Student 12's Duolingo levels were Spanish (11), Italian (10), French (9), Portuguese (6), Dutch (1), Irish (1). Students 2's Duolingo levels were French (6), English (?) - he had perhaps deleted English from his record.

Teaching with Duolingo, Paul Magnuson, December 2014

During the two weeks that I substitute taught the intermediate Spanish classes I asked all students to spend some time on Duolingo each day. Because Duolingo keeps track of use by consecutive days in a row, I imagined I could easily convert the individual student user history into a grade.

This worked well at the end of the week for students who had scored points each day of the week. Their user streak was an unambiguous five or more days. However, a student who had missed just one day that week might have a streak on Friday of one, two, three, or four days, depending on what day the student did not score any points. I could still grade student use, but really only with a yes or a no, a pass or no pass, for getting some points every day for five days or for not getting some points every day for five days.

Further, it is possible to spending time doing Duolingo without getting any points. At the time I was subbing the Spanish classes, Duolingo still used a three strikes and you're out system of passing each lesson. Students would tell me they worked on Duolingo, trying one lesson several times but failing to pass, thus failing to get any points, thus losing their streak of consecutive days. Using the recorded streak for grading was not effective.

Progress in written language

Self-reporting

I asked students to self-report if they thought Duolingo was helping them progress.

Nine of 12 students (four students didn't address the question at all, for a total of 16 students in the class) reported that they were happy with their progress, many of them literally used the word "happy" as is evident in their quotes below. Two students felt that their progress wasn't fast enough. One student felt he had made no progress and that he does not know "the purpose of this class" and he already knows "the languages that I need." It may be no surprise that he exhibited challenging behaviors in class, which probably arose in part due to his belief that he has nothing to learn from the class. His challenging behavior also contributed to missing out on opportunities to learn. Without telling him, I asked the academic office if there was an option for him to switch to another class (the Linguistics & Languages class is a non-required elective), but as may often be the case in a small school, there was not a class at the same period that is a good fit for him. I'll take it as a personal challenge to elicit a more positive self-report next semester.

Excerpts from the responses of all twelve students who answered the prompt follow. They were asked to self-report their progress in Week 12 of class.

Progress

"I think I have made a lot of progress. I know that because I've been practicing my Spanish with my Mexican friends and they say I speak very well …"

"I am very happy. I feel very proud of my progress. Love this language learning stuff."

"My progress made me feel happy and excited. I want to learn more and more. I thing that I did pretty good job."

"My progress make me feel happy …"

"My progress makes me feel confident when I go to talk to other people using a foreign language."

"I felt pretty good of my prograse. Espacialy when I have a really quiz then I passed it. But it hard to use what I learnd in daily life."

"My progress makes me feel happy … It makes me feel great."

"I feel proud of myself, how I can write with full sentences …"

"My progress is stable and I'm happy with it."

Not enough progress

"I think that I should improve more. Because when I hear friends is much easier but writting it is till very hard."

"I know more verbs, but the vocabulary is very difficult to me, they are complete new words to me, but I'm happy I did some progress, but I need to do much more progress."

No progress

"I don't feel like I have made any progress."

While the self-reports are positive, students are to a degree writing what they think their teacher wants to hear, and since they know I'm a Duolingo enthusiast, they may have been currying favor a bit.

Student writing samples

Occasionally during the semester I also asked students to write for five minutes in the language they had chosen to study. Some of the students wrote word lists at the beginning of the semester and with my encouragement moved to sentences by the end of the semester, many

students switch between languages. While there isn't a manner to judge progress due to Duolingo (many of the students also have a French or ESL class in addition to the language class with me), students may be able to see their own growth, particularly after another semester.

Sample A

This student speaks English and Spanish. She began French in Week 1 of the semester. At the end of the semester her Duolingo levels were Portuguese (9), Spanish (9), French (8), Danish (1), Swedish (1). She was also enrolled in the first semester of French.

Week 5 entry

J'aime mon chain. Je parle espagnol, angle, et un peu petit francais.
Legumes
Chien
Chat
enfants, avez-vous enfants.
elle/il
es, est, sont.
Nous sommes, vous avons….
viande, riz, rouge, noire, mange une pomme. cafe au lait. :)

Week 12

Toward the end of the semester she had made good friends with Portuguese speakers and added Portuguese.

Oi. Bonjour, je m'appelle [name] mais……. je ne sais pa. Mon classe de langue c'est tres facil :). Aujourd'hui c'est vendredi vingt-huit de novembre. Je porte un t-shirt blanc, une jupe noire, et bottes beige. La noite e muitto linda. essa linguagem é muito lindo. muito fácil para mi ...mas às vezes acho que é muito difícil. pronúncias são irritantes. Eu sou muito bom com a escrita.

Sample B

This student speaks Russian and one additional language from the former Soviet bloc. He is in the most advanced ESL level.

Week 5

Hello my name is [name], I'm from [country]. I'm studying in the Switzerland.
In the future I want to be a businessman. I really like to play tennis, my favourite player is Novak Djokovic. I'm sixteen years old and I have a big family.

I love my family
In the future I want to make [country] more better and famous. I will be the most richest person in [country]

Week 12

Hello Everyone I will tell you one more story from my life. My life is really interesting and exciting. Yesterday i went to the tennis match in France. It was really awesome match, my two favourite players were playing against each other. I never saw like this games in my whole life. My father and I love to watch tennis matches on the TV, but today we went with to the real match. I didn't expect that it will be so cool. I was so excited about match. Match started at 10:00 and ended at 5:00 the game was really long, my father and I sat there for 5 hours. I didn't know to whom I am because my 2 favourite players are playing. My father told me we will go more and more to the matches like this in the future.

Again, it is difficult to say in these and the rest of the student examples to what degree there is any improvement, and impossible to say if any perceived improvement is due to Duolingo, since the students are learning in other classes, through the lingua franca of the school in the case of ESL students, and by living with speakers of the language, assuming they are interacting at least sometimes in the languages of their friends.

Progress in spoken language

After selecting a language to study at the beginning of the semester, each student made a 60 second oral recording with the instructions to say as much as they could. There were some written prompts on the whiteboard where they recorded. One of the students acted as the recorded, saving their audio file using Quicktime.

I did not make recordings at the end of the semester, but will at the end of the next semester.

Things that students did that surprised me

I didn't expect students to switch from one language to another, but I am glad that they did. Many students looked a bit at languages new to them, or climbed through seven to ten levels in at least two languages.

Nor did I expect students to work in their own native language, but this was fairly common. Sometimes it was curiosity or pride, sometimes it was to earn points quickly.

Because I work on Duolingo alongside the students, for a few weeks I was in competition with one student to have the most points. When he got ahead of me I increased my point total, usually to just within reach of his. When we saw each other we joked about who was going to

win. I felt like I was being very tricky by continually catching up to him and pushing him forward, but …

The student was deleting his progress in French, and then retaking the placement test, which awards lots of points for all the levels passed, all at once. It turns out the student was pushing me to get more practice more than I was pushing him, because he could earn a few thousand points in ten to fifteen minutes, it probably took me a few hours of translating articles to catch up to him. Even worse, his limited practice was in French … which was his native language.

While not quite a surprise, there were times when students passed out of levels in a language that I am fairly sure they could not have accomplished on their own. In other words, there was some cheating from time to time. It is virtually impossible to verify, but there are of course indicators to a teacher who knows a student's ability fairly well and is suddenly confronted with results that far exceed what seems possible.

Finally, I did expect at least some percentage of students to get hooked on doing Duolingo, which doesn't seem to be the case for any of them. I remember when Stephen Krashen was on campus a few years ago and someone asked him what he thought of Duolingo. His answer amounted to doubt that learners would stick with it. While I've encountered plenty of users on Duolingo who are definitely sticking with it, from the pool of millions I suspect the majority do not. Anecdotally, several staff members here that were initially very interested have slowed down or stopped using Duolingo. At this point, I don't expect the students to have much staying power either.

Things students didn't do (or didn't do more often) that surprised me

I made it clear a number of times that students could switch away from Duolingo, yet only one did over the entire semester. Unfortunately, this is due in my estimation more to a lack of self-motivation than to a love for Duolingo. Moving to another system would require some intrinsic drive, a bit of work. It is easier to just slog along with what is given you by the teacher.

I also made it clear that any sort of language learning was okay, but in the first semester I only saw one student watching cartoons, for example, in French (the student was a native Russian speaker). Here is a class in which the teacher is saying to the students to sit down and watch movies in a language they are studying, but they don't, or at least rarely did.

It took awhile for students to look up from their computer and ask a native speaker in the class for help. There are two native French speakers in the class, and most students were learning French. But few asked the native speakers for help.

No student asked another student to set up some sort of conversational exchange, even though many were learning languages that others speak as native speakers.

No student brought a book to class, or a magazine, newspaper, printed article, etc. One of the adults modeled book reading in the first few weeks of class. I'm not sure any of the students would even remember that he was there or what he was doing.

A strangely silent classroom

The head of the modern language department visited class one afternoon. After she observed for awhile, she remarked, "This is the quietest language class I've ever seen." I looked around at the students, spread around our large room, most of them wearing earbuds, working with laptops or smart phones, the only sound the short bursts of tap tap tap on a keyboard. It was very quiet.

Which led me to ask: where is the noise of a regular modern language class coming from? Because if it's mostly from the teacher, that same noise - or better said, language input - is coming from Duolingo. Were the silent students of this class radically different from students in other modern language classes?

I designed and piloted a way to observe the language production of students in modern language classes.

Pilot Design

As the data collector, I arrived at the language class (I observed one French and one Spanish class, beginners and intermediate students, grades 10-12) ahead of the students and kept track of the order in which students arrived in order to have a quasi-random sample. For the rest of the 50-minute class period, I observed students 2, 5, and 8 (in arrival order). Each time the student produced language (the "noise" I was interested in), I estimated the length of the student's production as best I could. While inexact, I felt the results would give a reliable estimate of the amount of time any particular student produces language during a regular class, with which I could then make comparison to my class of learners using Duolingo, whose language production time was close to zero.[3]

Pilot Results

The data from the two classes in which I piloted the study may seem surprising. Of the six students I observed, the range in spoken language production was 4 to 110 seconds, mean of 51 seconds. For these six students, the mean language production time was less than a minute.

TABLE 2: *Student production time in two modern language classes*

---

[3] Duolingo exercises can include speaking exercises. The user has the option to turn on or off speaking and listening both. Most students in my class, however, did insignificant amounts of speaking while using Duolingo.

	Class 1 (11 students)			Class 2 (12 students)		
	Student 2	Student 5	Student 8	Student 2	Student 5	Student 8
Time in seconds	51	66	52	23	4	110

While at first gloss surprising, a class taught in a traditional manner, in which the teacher initiates an interaction, gets an answer from one student, and then comments on that student's answer[4], the result is less surprising. Let's look at the math in a highly simplified example.

In a 50 minute class, when the communication pattern is Teacher, Student, Teacher, the teacher speaks two-thirds of the time, or 33 minutes. There are 50 minus 33 minutes left for the students, or 17 total student minutes. However, there are multiple students. In the classes I observed, there were 11 and 12 students. There are than 17 minutes divided by 11 or 12 students for each individual student, or , or 1.4 to 1.55 minutes per student, which is approximately 90 seconds per student.

This approach to observing language classes is likely another good action research project, particularly for someone in the modern language department. If language production is valued in learning language (and I think we would find plenty of support for this in the literature!), then the teaching method needs to provide space for student production of the language. Anecdotally, at approximately the same time as the second pilot observation I observed a class that was set up specifically to emphasize students producing oral language and the numbers here would be much different if I had piloted the same study in that class.

However, besides stumbling on a nice action research project for a modern language teacher, the main point here is that assuming the strange quietness of the Duolingo class is vastly different from a noisier traditional language class may be misguided, at least if the measure is the amount of time a given student is producing oral language.

Another interesting comparison for a future study is language input. For Duolingo, assuming the student is actively working, there is instant input (complete with adjustable volume and two available speeds). In the language classrooms I visited, there are often times when the teacher is working with one student or with one group of students during which the rest of the students may not be receiving any input, as they either wait for the teacher, discuss the groupwork in English, or are otherwise off task. Of course, this isn't to say that students using Duolingo don't struggle with being off-task as well.

---

[4] This is the Initiation-Response-Feedback (IRF) model prevalent in classroom settings.

Recommendations for Duolingo if pursuing classroom use

Progress Quizzes

There are adaptive quizzes available in each language which the user can purchase for 25 lingots, Duolingo's gamified currency. A teacher using Duolingo with a class could have all students use the built-in quiz feature (which produces a score from 0 to 5 and can be retaken as many times as the user "buys" the quiz). However, the current lingot price means not all students have access - nor want to spend their lingots in this way.

Also, it would be interesting to know what the progress quiz results mean beyond Duolingo. Perhaps future progress quizzes can be benchmarked with an established test of written language proficiency.

Rewards

Duolingo awards the user by showing progress toward completion of a particular skill and two lingots for completing a skill, as well as bonus lingots for completing streaks, measured by days in a row. There is also a certificate awarded when the user completes the entire set of grammar and vocabulary skills (the skill tree). All of these are motivational for some students.

Additionally, it is possible to give one's own lingots to other other users, usually as thanks for a good answer or suggestion in the Discussion feature. Designers, if developing Duolingo for classroom use, might like to consider how a teacher can use lingots to signal good student work, and how students might trade lingots with each other.

Measuring progress

I ran into difficulties when adapting Duolingo for tracking student progress and, even with my very relaxed grading structure (pass or no pass for the week for showing subjective, individualized progress), it was hard to translate Duolingo use into adequate or less than adequate progress and it would be even harder where an A-F grading system were required.

For the purpose of this study, I kept track of each students weekly total. It was necessary to transfer the total weekly points (which Duolingo reports) on Sunday evening before the new week started, because once the week is over the past weekly total disappears, leaving as history only the monthly and lifetime totals.

There is also no way to see how much time a student actually spent trying to earn points. Rather, there is simply the report of how many points earned. This is tricky for a teacher for at least two reasons. First, some students try hard to complete a lesson but simply don't - for which they receive no points, for which there is then no indication that they tried. Second, students

learned to trick the system by deleting their entire progress and then using the placement test feature to earn lots of points all at once (but without the benefit of actually learning). This could be fixed by not allowing students to delete their progress.

Keeping track of streaks is tricky as well. If the student scores points in Duolingo five days in a row, Duolingo reports a streak of five, which is useful information for the teacher. However, if the student scores points four out of 5 school days, not scoring any points on Wednesday, then the streak on Friday is two, with no indication that the student did score points on Monday and Tuesday.

There is an activity report that shows activity for all the users one is following. I followed my students, and required them to follow me, which is convenient to see what they are doing. This feature could be adjusted a bit for classroom use, tagging activity with a day and date instead of the number of hours ago, or the number of days ago, if one is looking to see if a student scored points with Duolingo on a given day. Realistically, designers would have to look into how a student report might be generated that included all students in a class. Otherwise, the teacher has to go into each individual students activity feed.

For awhile there was a game feature available on the mobile version of Duolingo that allowed one player to compete directly with another player. This feature was apparently disable by Duolingo before I could use it in the classroom context. The return of that feature - or similar ones that pit one student against another for fun, while earning points - would have some practical applications in a classroom context.

Summary

The Linguistics & Languages class described here is not only about Duolingo, but Duolingo has served and will continue to serve as the basis for online learning.

There certainly are elements of the class that create a unique language learning class. To list a few:

- students choose what language or languages they'd like to learn
- students begin with Duolingo but can choose their own path with time (according to just a few parameters)
- adults join students as students during class time
- the teacher learns along with students
- the students and teacher co-author a book over the course of the year
- students use an IT workflow process to structure their group work
- grades are pass/no pass by week
- the students choose their own preferred device (laptop, tablet, smart phone)

On the other hand, the methodology and learning processes seem much less unique if one simply shifts the context away from a high school modern language class.

Imagine a Starbucks on any given Saturday. Several customers are working individually on their laptop (or tablet or smart phone), white ear bud cords and all, a few folks are talking with each other, and at one table a group of people have paper and books spread out in front of them, laptops balanced on their knees, writing and talking. Now, pretend that these customers are all on their way to the vocational foreign language school next door, where they are studying various languages. They have all stopped at Starbucks for an hour of study before going to class to learn various languages at various levels of ability.

How do they study? Some are working individually online, leveraging the large number of language learning platforms, experimenting with this one or that one, settling on one or two they like and feel are beneficial to them. At one table a group is having a conversation about their weekend, in the language they are studying, for practice. At another table a group is quizzing each other on vocabulary and, between periods of laughter and distraction, discussing when a verb has to be in the subjunctive. The group with the pile of papers and books is preparing a presentation that they will give to the entire class next week.

Simply by transposing the environment from the high school classroom to Starbucks, the methodology of the Linguistics & Languages class seems normal, maybe even a little bland in its description, because we see it at a Starbucks anytime we drop in for a latte.

The main purpose of the class is for the students to learn to be self-directed learners. We are aiming to prepare them for a time after high school when they will learn much like the scene in Starbucks. In fact, they will structure their study time exactly like the scene in Starbucks, much of the time. When are we preparing them for that?

Duolingo's role in all this is as a tool, alongside many other tools. Duolingo happens to be my favorite tool, and perhaps my enthusiasm will help make it - or another suitable online platform - the favorite tool of students who can start becoming stronger self-regulated learners.

If Duolingo is considering the creation of an add-on to make the app a better fit for classroom use, perhaps the description here, and others like it, will prove worthwhile. In the meantime, though, it's back to the Irish grammar and vocabulary exercises.

Beannacht maith do anois!

Thanks

A big thanks to all of you who help out!