ENGLISH PRONUNCIATION DEVELOPMENT THROUGH THE *FLOWCHASE* APP: AN EXPLORATORY STUDY

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INTRODUCTION

- Sensitive or critical period: 12 months as far as pronunciation is concerned (Ruben, 1999) → Further support needed
- However, in English as a foreign language courses and textbooks: scarce presence of pronunciation practice and teacher led if available (drilling exercises):

  Hardly any active role played by learners
- Alternative practice sources: apps, which can be used in class and extramurally → *Flowchase* (Broisson & Guérit, 2020)
- Pronunciation practice using technology promotes learners' agency, autonomy and self-perception, regardless of pronunciation gains (Calvo Benzies, 2017; Gkonou, 2014)
- Customised feedback on pronunciation impacts accurate phoneme production (Cucchiarini et al., 2009), although some issues concerning AI feedback remain (Rogerson-Revell, 2021)
- Time-on-task also positively linked to learning (Godwin et al., 2021)

INTRODUCTION

- *Flowchase* designed to practice productive skills, although receptive competence is also trained → Receptive pronunciation skills prior to productive skills (Flege, 1995)
- Productive skills more noticeable, easily perceptible and objectively measurable as compared to receptive skills, which are more difficult to ponder on, especially without explicit instruction and little metalinguistic awareness.
- Improvement to be expected as a result of explicit instruction and immediate feedback:

  Especially in learners' receptive pronunciation skills (Wallace & Lima, 2018), which tend to be more easily mastered than productive competence (Richards, 2015)

- Previous studies integrating *Flowchase* and explicit focus on pronunciation led to a significant impact on L2 secondary school learners' accurate pronunciation (Cordier, 2022).

AIMS AND PARTICIPANTS

Objectives

- To investigate whether *Flowchase* (Broisson & Guérit, 2020) can contribute to improving English receptive pronunciation skills.
- To contrast if additional pronunciation practice may influence learners' self-perception of improvement in this skill.

Participants

32 first-year university students from two intact classes enrolled in the Primary Education degree:

- Experimental group (EG; *n*=19), who interacted with *Flowchase* extramurally and did in-class pronunciation practice
- Comparison group (CG; *n*=13), who did not interact with *Flowchase* and followed the regular textbook-based curriculum (without a clear focus on pronunciation)

Proficiency ranging from A2 to C1; mean level: A2-B1

METHODOLOGY

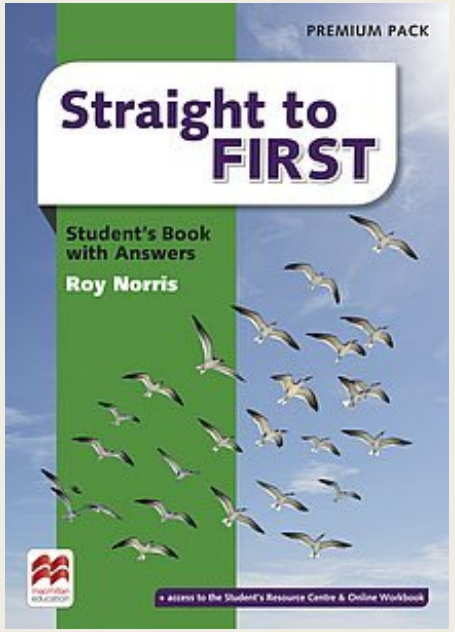
<u>Coursebook – *Straight to First*</u> (Norris, 2016)

- Same textbook followed by both the EG and the CG
- FCE-aimed textbook (B2 level)
- Strongly oriented towards passing the FCE exam:

  - Grammar-focused
  - Exam-like exercises
  - Writing bank
  - Wordlists

- But… no clear focus on pronunciation unless provided by teacher
- Alternative ways of practicing pronunciation needed:

Flowchase



METHODOLOGY

Flowchase (autonomous pronunciation learning)

Six units targeting three sets of phonemes (/i:/ and /ɪ/; /t/, /d/ and /ɪd/; /ɔ:/ and /əʊ/)

For each unit:

Tutorials

1. /i:/ and /ɪ/ — An important contrast

Mixing up the sounds **/i:/** and **/ɪ/** is a mistake made by **many learners** from **various first language backgrounds**.

What's tricky is that the two vowels are frequently found in English, and more particularly in similar, also frequent words — such as **sit** and **seat**. Therefore, learning to hear and pronounce the difference between them is important **and** productive!

Fact: Studies by **Brown (1991)** and **McAndrews & Thomson (2017)** showed that substituting vowels such as /i:/ and /ɪ/ is a common mistake and leads to misunderstandings due to the high frequency of those vowels in the English language.

Example:

sheep vs. ship
seat vs. sit
leave vs. live
eat vs. it

2. Copy of Flowchase tutorials A to B

A. This sheep has sailed

The English language has **6 vowel letters**: **a, e, i, o, u and y**
But each of them can be **pronounced in more than one way**... This means there are many different vowel sounds.

When speaking, learners of English often get mixed up between similar sounds.

Example:

sheep ≠ ship

METHODOLOGY

Flowchase (autonomous pronunciation learning)

For each unit:

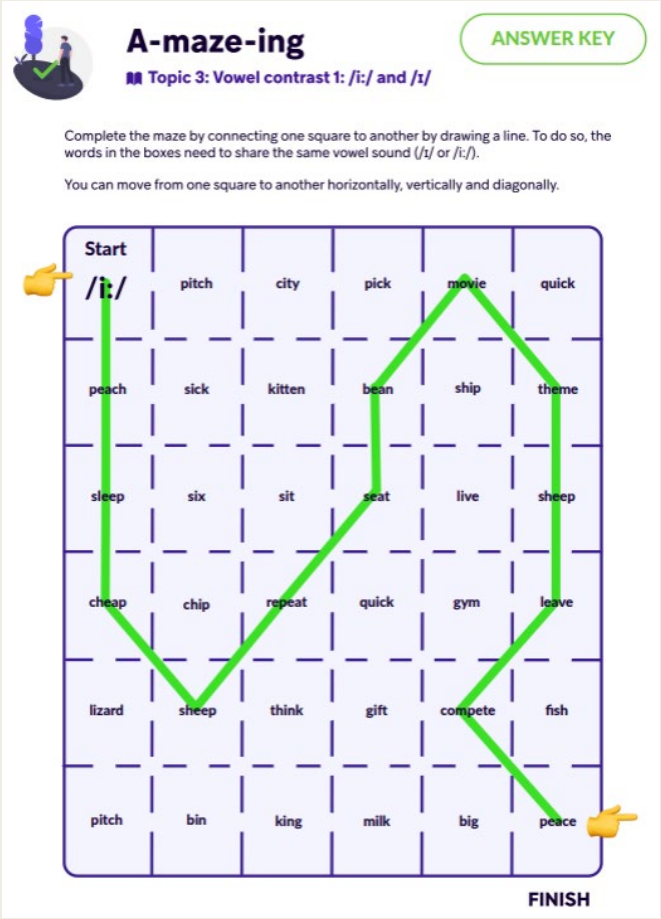
Learning activities

- Listening activities (e.g., the odd one out, multiple-choice questions, etc.)
- Speaking activities (e.g., imitating target phonemes, etc.)

METHODOLOGY

In-class pronunciation practice

Receptive skills (e.g., classifying activities, identifying phonemes, Kahoot!, phonetic transcription, pronunciation maze, etc.)



A-maze-ing

ANSWER KEY

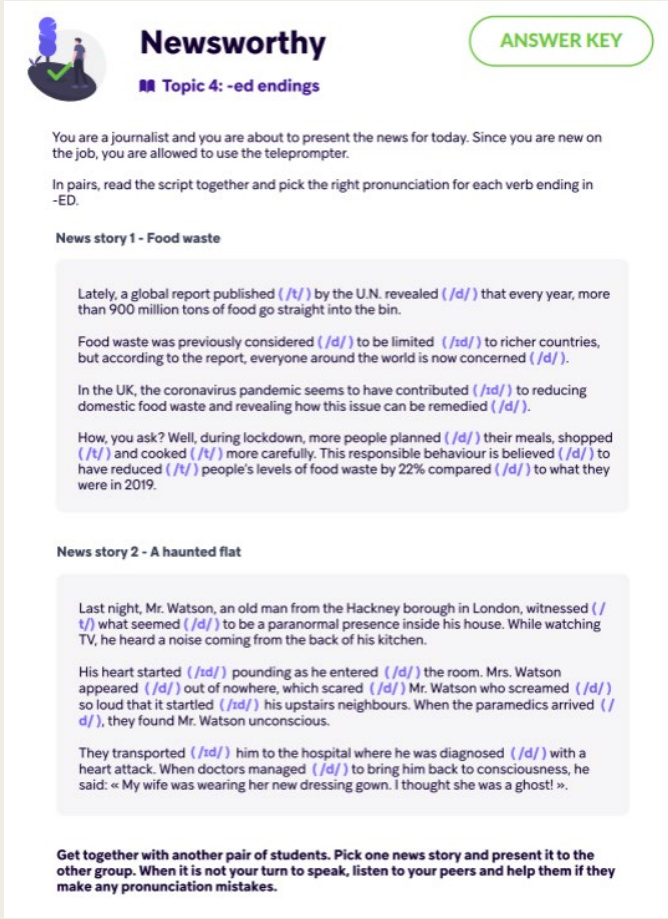
Topic 3: Vowel contrast 1: /i:/ and /ɪ/

Complete the maze by connecting one square to another by drawing a line. To do so, the words in the boxes need to share the same vowel sound (/ɪ/ or /i:/).

You can move from one square to another horizontally, vertically and diagonally.

Start /i:/	pitch	city	pick	movie	quick
peach	sick	kitten	bean	ship	theme
sleep	six	sit	seat	live	sheep
cheap	chip	repeat	quick	gym	leave
lizard	sheep	think	gift	compete	fish
pitch	bin	king	milk	big	peace

FINISH



Newsworthy

ANSWER KEY

Topic 4: -ed endings

You are a journalist and you are about to present the news for today. Since you are new on the job, you are allowed to use the teleprompter.

In pairs, read the script together and pick the right pronunciation for each verb ending in -ED.

News story 1 - Food waste

Lately, a global report published (/t/) by the U.N. revealed (/d/) that every year, more than 900 million tons of food go straight into the bin.

Food waste was previously considered (/d/) to be limited (/ɪd/) to richer countries, but according to the report, everyone around the world is now concerned (/d/).

In the UK, the coronavirus pandemic seems to have contributed (/ɪd/) to reducing domestic food waste and revealing how this issue can be remedied (/d/).

How, you ask? Well, during lockdown, more people planned (/d/) their meals, shopped (/t/) and cooked (/t/) more carefully. This responsible behaviour is believed (/d/) to have reduced (/t/) people's levels of food waste by 22% compared (/d/) to what they were in 2019.

News story 2 - A haunted flat

Last night, Mr. Watson, an old man from the Hackney borough in London, witnessed (/t/) what seemed (/d/) to be a paranormal presence inside his house. While watching TV, he heard a noise coming from the back of his kitchen.

His heart started (/ɪd/) pounding as he entered (/d/) the room. Mrs. Watson appeared (/d/) out of nowhere, which scared (/d/) Mr. Watson who screamed (/d/) so loud that it startled (/ɪd/) his upstairs neighbours. When the paramedics arrived (/d/), they found Mr. Watson unconscious.

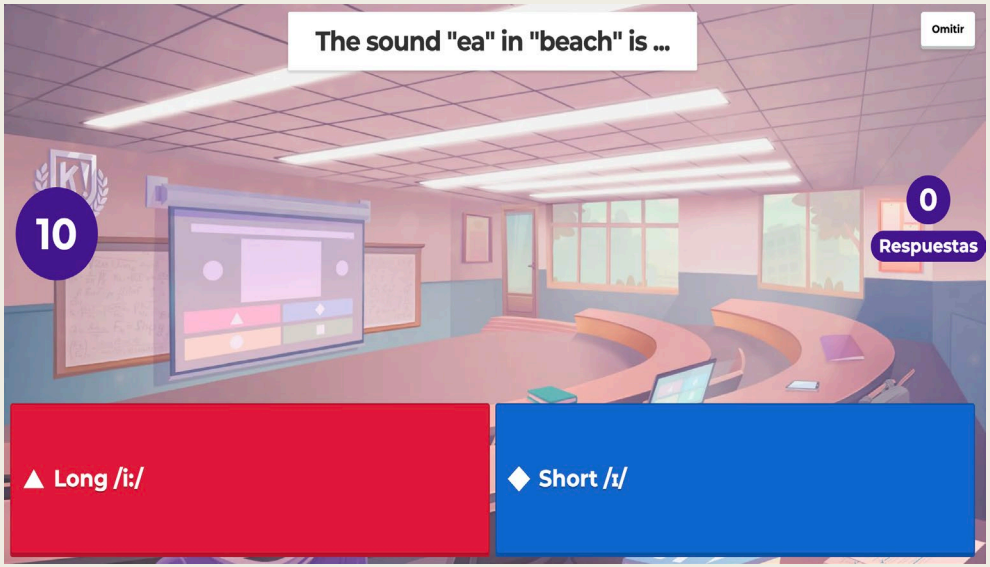
They transported (/ɪd/) him to the hospital where he was diagnosed (/d/) with a heart attack. When doctors managed (/d/) to bring him back to consciousness, he said: « My wife was wearing her new dressing gown. I thought she was a ghost! ».

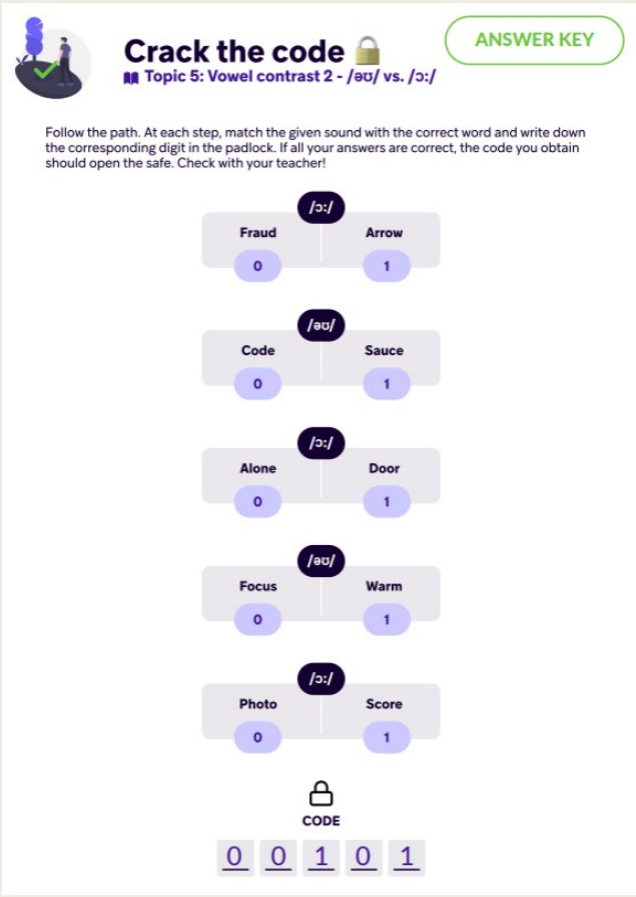
Get together with another pair of students. Pick one news story and present it to the other group. When it is not your turn to speak, listen to your peers and help them if they make any pronunciation mistakes.

METHODOLOGY

In-class pronunciation practice

Receptive skills (e.g., classifying activities, identifying phonemes, Kahoot!, phonetic transcription, pronunciation maze, etc.)





METHODOLOGY

Pre- and post-test

28 target words (TW) containing the target phonemes (seven per phoneme); all appeared in the app:

- 14 correctly pronounced by an L1 English speaker
- 14 mispronounced by an L1 English speaker

+ 44 distractors (not including the target phonemes)

Aural form recognition (receptive pronunciation):

"You are going to listen to some words. Please, tick "YES" if a word is pronounced accurately and "NO" if it is pronounced incorrectly."

	YES	NO
1. BRAIN	X	
2. SWAN		X
3. SMOOTHED	X	
4. PLATED	X	
5. WARM		X

METHODOLOGY

Critical reflection task

- Only completed by those in the EG, who had interacted with *Flowchase*
- Essay format; 140 and 190 words long
- Aimed at enquiring about:

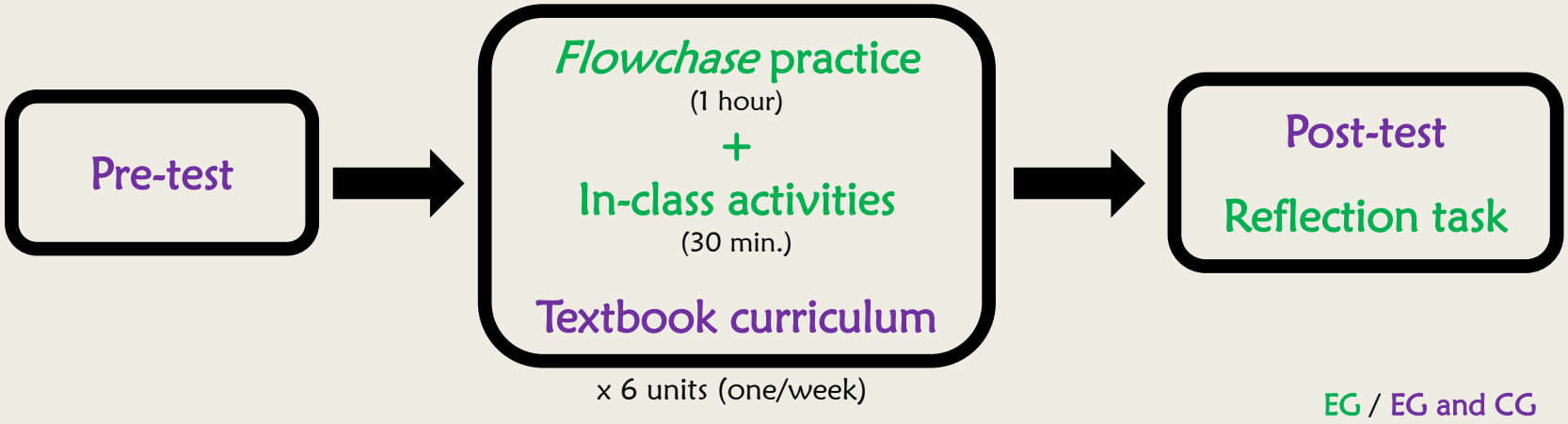
  - Perceived difficulty of pronunciation
  - Participants' views
  - Usefulness of the app / project
  - Feeling of learning
  - Comparison with previous and present pronunciation teaching approaches

After having completed all the activities in *Flowchase*, write an essay, with paragraphs, where you develop the following points:

- Which of the sections (vowel contrast /i:/ and /ɪ/, final -ed, vowel contrast /ɔ:/ and /əʊ/) have you found:
  - The most difficult?
  - The easiest?
- Overall, do you think that using the app *Flowchase* has helped you to improve your pronunciation? Why (not)? If you think it has helped you, explain how.
- Overall, have you found the materials useful (both the app exercises and the exercises done in class) to improve your pronunciation? If so, which one(s) have you found the most useful?
- You have now taken the same test twice. Once at the beginning, before having used *Flowchase*, and a second time, after having completed all the units in *Flowchase*. In your view, do you think there will be a large difference, regarding your results, between the first test you took and the second one? Do you think you learned what you expected, more, less…? Why?
- In comparison to your former teachers, *Flowchase* has helped you to learn… Why?
  - Much more pronunciation
  - More pronunciation
  - The same
  - Less pronunciation
  - Much less pronunciation
- In comparison to your current teacher at university, *Flowchase* has helped you to learn… Why?
  - Much more pronunciation
  - More pronunciation
  - The same
  - Less pronunciation
  - Much less pronunciation

PROCEDURE AND ANALYSIS

Procedure (eight-week study)



Analysis

- Only 28 TWs were analysed (those appearing in the app)
- Correct answers one point; no points deducted for incorrect responses
- Participants' relative gains were calculated
- Wilcoxon signed-rank tests and independent samples *t*-tests
- Reflection tasks were analysed *ad hoc* (positive, negative or mixed view) and compared to results across groups

RESULTS

Table 1
Descriptive Statistics, Divided by Group

	Pre-test		Post-test		Relative gains	
	M	SD	*M*	SD	*M*	SD
EG	16.47	3.27	18.47	2.76	13.68	14.55
CG	15.69	3.35	16.85	2.67	5.90	18.08

Note. Maximum score in the pre- and post-test: 28 points.
Note 2. Relative gains are shown in percentages.

Significant improvement from beginning to end of the study in the EG:

Z=128.5, p=.002 (n=19)

But not in the CG:

Z=50.5, p=.113 (n=13)

However, no differences in relative gains between groups:

$t(30)$=1.346, p=.188

RESULTS

EG participants labelled *Flowchase* as being a:

- Positive experience → *n*=9 (47.4%)
- Negative experience → *n*=4 (21%)
- Mixed experience → *n*=6 (31.6%)

Table 2

EG Participants' Descriptive Statistics, According to Flowchase View

	Pre-test		Post-test		Relative gains	
	M	SD	*M*	SD	*M*	SD
Positive	15.44	2.65	17.11	2.09	10.35	10.31
Negative	18.50	2.52	20	2.16	13.42	25.19
Mixed	16.67	4.27	19.50	3.33	18.85	12.61

Note. Maximum score in the pre- and post-test: 28 points.
Note 2. Relative gains are shown in percentages.

No difference in relative gains depending on participants' view:

$H(2)=1.112$, $p=.573$; pairwise comparisons not statistically significant

RESULTS

Students pointed out the usefulness of *Flowchase*:

"The app helps you to put into practice the oral aspects that are previously worked on, and this has made my **pronunciation significantly better**."

"Consequently, has *Flowchase* helped me to improve my pronunciation? **Absolutely, yes!** This app is a tool to devote time every week and **work without realizing it**."

"To sum up, after retaking the test we did at the beginning of the course, I think *Flowchase* is a **very useful application for learning** how to pronounce correctly."

"Class activities have helped me to improve my pronunciation, but **not as effectively as the *Flowchase* app**."

Also, in-class activities were thought to promote learning:

"I have to say that the exercises we did in class, like Kahoot! and exercises in pairs, **reinforced** the things that we had learned through *Flowchase*."

"I would like to add that working on *Flowchase* topics in class has helped me to **practice more** and to **solve doubts** with my English teacher."

"Overall, the exercises done in class were the ones which helped me to learn more, as they were **more real**, and I had **direct access to the teacher**; more than those in the app."

RESULTS

Technical problems were also mentioned:

"*Flowchase* can be a good option to improve your pronunciation, but sometimes this app has **problems and can make you angry**."

"Sometimes, when I **said something wrong** or any word or sentence that did not match what the application was asking me to say, it [*Flowchase*] counted it as **good**."

"I found the exercises in the app useful, but you **have to be careful** because sometimes you didn't say anything, and it [*Flowchase*] counted it as good."

Negative views were reported, too:

"*Flowchase* has helped me to **learn less pronunciation**, because my teacher, if I pronounced something wrong, corrected me in a better way than what the app did, and did not make me repeat the same phrase many times."

"Personally, I always prefer someone real than a machine because teachers are closer to their students. In my case, I have learned **more pronunciation with my teachers than with apps**."

"In my opinion, this pronunciation app **has not helped me enough**. Sometimes, it was fun, but other times the app **did not work well**. Actually, when I finished all the units, I didn't feel any big change in my pronunciation."

DISCUSSION

- Focus on the task (EG) led to significant development during the study → More time-on-task has typically shown positive correlations with learning (Godwin et al., 2021)

- No special focus on pronunciation through textbook: grammar-focused and FCE-aimed → Little progress expected in the CG

- However, post-test > pre-test in both groups:

  Test effect? Although seven weeks apart, learners could have paid more attention to mispronounced words; weird for them if some metalinguistic awareness

- No difference in relative gains between EG and CG:

  - App's technical problems
  - Inaccurate feedback; AI drawbacks (Cucchiarini et al., 2009)
  - Mismatch between test and practice
  - Little time devoted to pronunciation practice (≈1.5 hours / week)

- Impossible to determine if at-home *Flowchase* practice or in-class exercises contributed to pronunciation development and, if any, which of the two played a bigger role → Second experimental condition needed

DISCUSSION

- Most EG participants labelled *Flowchase* as a positive or mixed experience (79%):

  - Useful to learn pronunciation; more than other traditional approaches or absence of pronunciation teaching
  - Feeling of learning from pre- to post-test; partial mismatch between participants' self-perceived usefulness of the app and actual learning potential (no differences in terms of relative gains) → Novelty of the task?
  - However, EG post-test > EG pre-test; aligned with participants' views

- No differences in scores depending on participants' views (very reduced sample)

  - However, those with a negative view had the highest scores: more aware of accurate pronunciation and spotted inaccurate feedback more easily?

- Aware of technical problems and value the in-class activities, sometimes more than the app itself → Role of teacher as an expert and guide (low-proficient learners with a strong reliance on teacher)

- *Flowchase* might have developed participants' agency and autonomous learning ability, more than metalinguistic awareness

LIMITATIONS

The study is not without limitations:

- Technical problems may have hindered pronunciation development
- Effect on learners' commitment to and motivation in the task, too
- Pronunciation practice mainly productive, while receptive skills were tested
- No questionnaire enquiring about feeling of learning administered and little monitoring of at-home *Flowchase* practice
- Reflection task may have been positively biased as participants knew it was addressed to the course practitioner
- Small sample, different results with a larger sample?

FURTHER RESEARCH

Possible future research lines include:

- Peer- and self-evaluation of one's / others' pronunciation
- Including more experimental conditions (e.g., teacher guidance on pronunciation practice, but no interaction with *Flowchase*)
- Using elicited imitation tasks to assess productive skills
- More refined versions of *Flowchase*

Thank you!

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