Affordances of digital technology for English pronunciation teaching: The perspective of Brazilian teachers

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RESUMO

Este estudo examina a visão de professores brasileiros de inglês sobre as possibilidades da tecnologia digital para o ensino de pronúncia. Foi realizada uma pesquisa online com um grupo de 42 professores. Todos eles possuíam graduação em um programa de formação de professores de inglês e tinham experiência em ensino. Os participantes responderam a um questionário elaborado para reunir informações sobre sua formação educacional e perguntas que buscam identificar: (a) o que os participantes reconhecem como recursos digitais relevantes para o ensino e aprendizagem da pronúncia; (b) o papel desempenhado pelos recursos digitais em suas práticas de ensino de pronúncia e (c) suas perspectivas sobre as possibilidades e limitações dos recursos digitais para o ensino de pronúncia. Os resultados trazem insights sobre as possibilidades da tecnologia digital para o ensino de pronúncia e sobre as lacunas na formação de professores em relação ao ensino de pronúncia auxiliado por recursos digitais.

PALAVRAS-CHAVE:

Ensino de pronúncia. Tecnologias digitais. Formação de professores. Ensino de inglês.

ABSTRACT

This study examines the view of Brazilian teachers of English on the affordances of digital technology to teach pronunciation. An online survey was conducted with a group of 42 in-service teachers. All of them held an undergraduate degree from an English Teacher education program. The participants completed a background questionnaire that also included questions that aimed at identifying: (a) what the participants recognize as relevant digital resources for pronunciation teaching and learning; (b) the role played by digital resources in their pronunciation teaching practices, and (c) their perspectives on the affordances and limitations of digital resources for pronunciation teaching. The results bring insights about the affordances of digital technology for pronunciation teaching and about gaps in teacher education regarding pronunciation teaching aided by digital resources.

KEYWORDS:

Pronunciation teaching. Digital technologies. Teacher education. English teaching.

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Introduction

The English language has been present as one of the additional languages taught in regular schools in Brazil since the 19th century (CHAGAS, 1957). Still, the number of hours dedicated to its teaching has changed over the years. As Pereira and Lopes (2017) explain, currently the legislation requires that the curriculum of the final years of primary school offer 80 hours of English language teaching, and, in secondary school, the number of hours is reduced to 40.

Tílio (2014) explains that defining what to teach in the English classes has been a source of controversy in public schools. The curriculum has moved from a focus on the teaching of decontextualized grammar rules to a focus on reading comprehension. Nowadays, some professionals are likely to adopt the principles of the Communicative Approach to teach English or a Critical Literacy perspective, which means that their classes focus on the development of oral and written skills.

With the launching of the BNCC (*Base Nacional Comum Curricular* - National Common Core Curriculum) (BRASIL, 2018), new orientations concerning what to teach emerged. The BNCC assumes that English should be approached as a lingua franca (JENKINS, 2015; SIQUEIRA, FIGUEIREDO, 2021), and learning this language is important due to its social and political functions worldwide. Thus, the BNCC advises that English teaching in regular schools should aim at promoting multiliteracies, critical thinking, in addition to helping learners interact with people from other countries, join mobility opportunities, and further knowledge. Proficiency development is not a goal for the teaching of English in regular schools, and it should not be indeed, considering the limited number of hours dedicated to the teaching of additional languages in the regular school curriculum. The document proposes that the teaching of English should cover *oral skills* (at the comprehension and production levels), *reading* and *writing*, in addition to the development of *linguistic* and *intercultural* knowledge. It is emphasized that these five axes are interconnected and should be developed together.

With these new regulations, the teaching of pronunciation is expected to gain some importance in the regular school language classroom. Furthermore, pronunciation teaching is one of the curriculum components that can benefit from digital technologies development (ROGERSON-REVELL, 2021; BALDISSERA; TUMOLO, 2021). This article is intended to examine English teachers' perspectives regarding the affordances of digital technology to teach

pronunciation, and to achieve this goal, a survey was conducted with a group of in-service Brazilian teachers. The following section reviews literature regarding teachers' beliefs and practices about pronunciation teaching, as well as previous studies on the affordances of technology for pronunciation teaching. The third section presents the method, thus reporting on the participants' background, and the instruments and procedures used to collect and analyze data. The final considerations bring a reflection about the affordances and limitations of digital technologies for pronunciation teaching, based on the perspective of the Brazilian teachers who contributed with the present study.

This study was guided by the following research question: According to a group of Brazilian teachers of English, what are the affordances of digital technology to teach pronunciation?

1.1.   Review of literature

English pronunciation in language teaching is subject to a pendulum effect, with long periods of absolute absence in the curriculum and some moments of excessive presence (CELCE-MURCIA ET AL, 2010; LEVIS, 2005). In Brazilian schools of regular education (elementary and high school), pronunciation teaching has been notably absent in the last three decades (LEFFA, 2016; PAIVA, 2003). This situation is not surprising when we consider the official document that regulated additional language teaching policies in Brazilian schools from 1998 to 2017 (e.g., BRASIL, 1998), which highlighted the importance of reading skills, and as explained by Paiva (2003), considered teaching oral skills in regular schools unviable or irrelevant. The BNCC presents new policies for additional language teaching (BRASIL, 2018) which are likely to renew interest in the oral component for teaching English in regular schools in Brazil and a demand from teacher preparation to teach pronunciation components.

In the field of pronunciation teaching, Derwing and Munro (2015) reviewed a series of studies that show that many teachers are hesitant about pronunciation teaching, or that they do so sporadically and incidentally (error correction). The situation is similar in Brazil, as revealed by some studies that have examined English teachers' beliefs and classroom practices with regard to English pronunciation teaching. Studies such as Buss (2016), Costa (2016), Haus (2018), and Camargo (2020) showed that teachers generally report that they feel uncomfortable and unprepared to teach pronunciation. They also report that they need specific training to learn how to teach pronunciation. Faced with this scenario, teachers who contributed to previous studies reported that they are guided by intuitive notions of speech intelligibility in the teaching of

pronunciation.

On the other hand, students often express their desire to learn about pronunciation (DERWING, ROSSITER, 2002; COUPER, 2003; BAKER, 2011; BORGES, 2014; DERWING; MUNRO, 2015; COSTA, 2016; MARTINS, 2019) and often complain about the lack of practice in comprehension and oral production and pronunciation teaching in English language classes in regular schools (BORGES, 2014; MARTINS, 2019). In Brazil, there are studies describing the pronunciation difficulties that Brazilian learners of English face (cf. SILVEIRA, 2019; SILVEIRA, 2017; ALVES, 2016; ZIMMER et al., 2009). The results of these studies are not always incorporated into English language classroom practices, possibly due to the absence of courses that address pronunciation and the basics of English phonetics and phonology in the curriculum of English Language undergraduate programs at many universities in Brazil.

As Hinks (2015) explains, the field of pronunciation teaching is known for making frequent use of technologies, from ancient phonographs and gramophones, to the most recent recorders, CDs, computers and mobile devices, which added the possibility of self-recording, more opportunities for oral and auditory practice, and ample contact with different English varieties and accents. In this study, technological options will be often referred to as digital resources. Tumolo and Finardi (2021) broadly define digital resources as "any materials created digitally or converted to digital format, or any platform, application or program available digitally" (p. 11) and that can be used for pedagogical purposes.

The American Office of Educational Technology proposes a more detailed definition when discussing the use of digital resources to support language learning. According to them, "Digital Learning Resources (DLRs) refers to digital resources such as applications (apps), software, programs, or websites that engage students in learning activities and support students' learning goals." (Creating Educational Technology for English Learners, 2018, p. 1). They also propose categories of digital learning resources: "digital academic content tools, digital productivity tools, and digital communication tools" (p. 1). Chart 1 summarizes these three types of resources and provide examples for each of them having in mind pronunciation teaching and resources that are familiar to Brazilian teachers.

Chart 1 – Digital Learning Resources Classification

Digital Learning Resources	Affordances	Examples
Digital academic content tools	Displaying academic content	Websites, blogs, tutorials, video-lessons, databases
Digital productivity tools	Allowing content production	PowerPoint, Word-processing tools, Mindmapping tools, Padlet, Jamboard, Canva.
Digital communication tools	Allowing communication, collaboration, and presentation	Word-processing tools, Google suite tools, WhatsApp, Conference tools, e-mail

Source: Authors, based on information from Creating Educational Technology for English Learners (2018)

The American Office of Educational Technology website adds that digital learning resources include various "support features", which are defined as "specific embedded features in digital learning resources (DLRs) that assist students in understanding or communicating the content and/or activities provided in the DLR" (Creating Educational Technology for English Learners, 2018, p. 2). The features are classified into four categories: visual, auditory, translation and collaboration support features. Among these four categories, the first two are particularly relevant for pronunciation teaching. Visual support features are found in many websites, apps and blogs that offer word transcription using some sort of phonetic alphabet, or vocal tract images, ultrasound images or different types of animation showing sound articulation, or even closed captions present in videos. Furthermore, auditory support features are also found in digital resources that allow clicking on words to listen to their pronunciation, or soundtracks, and resources that include text-to-speech or speech-to-text tools, or even sound player and/or sound recorder tools.

Although the contributions of digital resources for pronunciation pedagogy are a consensus among researchers (HINKS, 2015; CUCCHIARINI; STRIK, 2018), a question remains as to how much in-service teachers are ready to employ these resources to teach pronunciation. There is already a reasonable amount of international research on the use of technological resources for pronunciation teaching (e.g., CUCCHIARINI; STRIK, 2018; HARDISON, 2007; HAN, 2012, HINCKS, 2015; FOOTE; MCDONOUGH, 2017). As Pennington and Rogerson-Revell (2019, p-235-236) explain, pronunciation teaching assisted by digital technologies "offers endless opportunities for repetition and imitation, instant responses and exposure to a wide variety of speech in the target language", in addition to providing automated feedback and enabling individualized learning. But these authors also caution about how "technology often takes precedence over pedagogy" (PENNINGTON, ROGERSON-REVELL, 2019, p. 238), which often means that digital resources

designed for pronunciation teaching and learning such as applications and websites have limitations regarding pronunciation components, English varieties, type of activities and feedback, and integration with other language curriculum components.

Figure 1 is our attempt to illustrate important affordances of digital resources for pronunciation teaching and learning, as highlighted by authors such as Rogerson-Revell (2021) and Baldissera and Tumolo (2021). First, digital resources can contribute to pronunciation teaching and learning by allowing room for individual work for learners who lack time to attend classes or who need additional time to practice. Second, digital resources may offer a less stressful environment for language learning in the case of learners who feel uncomfortable interacting with others or when there is pressure for them to speak in public, for example. Third, digital resources also allow learners to concentrate on pronunciation components that are more relevant and/or more challenging for them, as well as define how often and when they want to study a specific pronunciation component. Fourth, one major contribution for both learners and teachers is that digital resources offer limitless access to pronunciation supporting materials and speech samples from a wide variety of accents, age groups, and educational background. Fifth, it is undeniable that digital resources present both teachers and learners with multimodal information to develop speech perception and production, which make it easier to illustrate sound articulation, intonation patterns, and acoustic properties such as sound duration and aspiration. A sixth contribution is that digital resources enable learners to receive immediate feedback, especially for activities that focus on speech perception, as it is easier to point out accurate and inaccurate responses for speech perception than for speech production activities. For production activities, speech recognition and ultrasound applications can be used to provide immediate feedback, but the former still faces limitations regarding, for example, the assessment of L2 accented speech and length of utterance, while the latter requires a high level of expertise on the part of the user to understand the output and make pedagogical use of it (PENNINGTON, ROGERSON-REVELL, 2019). Seventh, both educators and researchers agree that a major contribution of digital resources to pronunciation teaching and learning is how it facilitates access to endless samples of spoken language spoken by a variety of users in a variety of contexts. Finally, digital resources provide a number of possibilities to have learners record their speech to monitor their production, as well as interact with other language users from all over the world in synchronous or asynchronous activities.

Figure 1 – Affordances of Digital Technology for Pronunciation Teaching
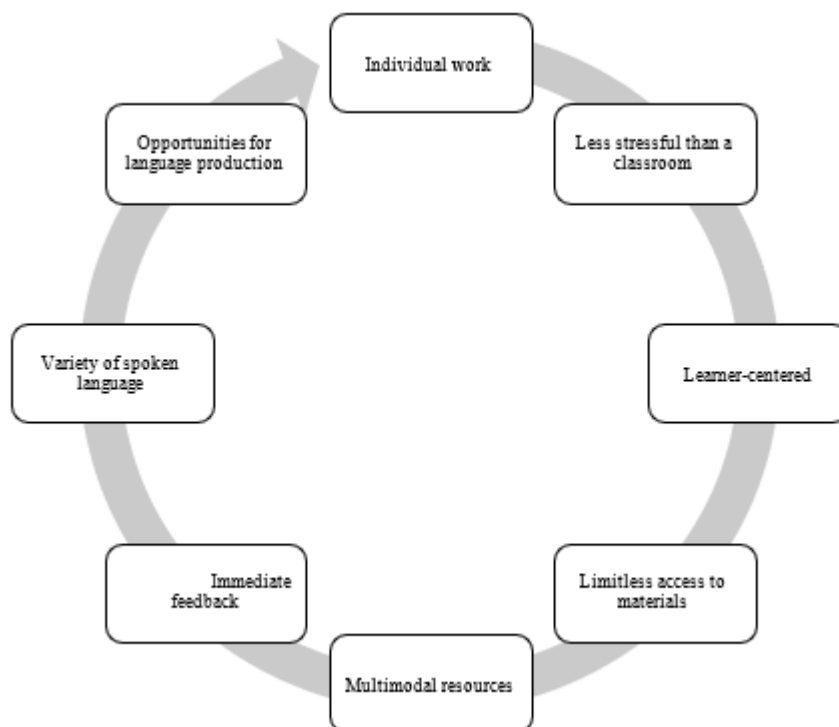
Source: Authors

But when we think of pronunciation teaching in the regular school classrooms in Brazilian contexts, what are teachers' perspectives on the use of digital resources for pronunciation teaching? In an attempt to answer this question, we conducted a survey with a group of in-service English teachers to examine their uses and practices regarding digital resources for pronunciation teaching. The following section provides details about the method employed for data collection and analysis.

2. Method

2.1. **Participants**

Data from 42 participants were considered for analysis. Initially, a group of 49 participants contributed data to this study on a voluntary basis. These participants were recruited over the internet, with the help of social media. The criteria to participate in the study was being an in-service English teacher in Brazil, and holding at least an undergraduate degree from an English teacher education program. In Brazil, this degree is generally called *Licenciatura em Letras Inglês*, occasionally offered as a double major by some universities (*Licenciatura em Letras – Português-*

Inglês). Six participants had to be removed from the study either for lacking teaching experience or for lacking the required major.

Table 1 summarizes the background information of the research participants. Their ages ranged from 23 to 53 (m = 33, sd = 7,8); 31 were female and 11 male. All of them reported holding an undergraduate degree from an English Teaching undergraduate program in Brazil, 24 of them from *Licenciatura em Letras – Inglês* programs, and 18 from *Licenciatura em Letras – Português-Inglês* programs. Almost 50% of them (20) reported having some sort of graduate degree: 5 of them are holders of both MA and doctoral degrees, while 15 hold an MA, a specialization degree, or both.

Table 1 – Summary of Participants' Background

Age	Sex	Undergraduate degree	Graduate degree
Mean: 33	Female: 31	*Letras Inglês*: 24	MA + DO: 5
Standard Deviation:7,8	Male: 11	*Letras Port.-Inglês*: 18	MA / Espec.: 15
Min: 23 - Max: 53			None: 22

N = 42
Source: Authors

The participants were recruited online, and as the whole study was conducted remotely, we gathered data from teachers of 13 different states in Brazil, thus having representatives of the five regions of the country[4]. Most participants (37%), though, come from Santa Catarina, which is the state where the researchers' university is located.

2.2. Instruments

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[4] Alagoas: 2, Bahia: 3, Ceará: 1, Espírito Santo: 1, Minas Gerais: 2, Paraná: 2, Rio de Janeiro: 3, Roraima: 1, Rio Grande do Sul: 6, Santa Catarina:15, Sergipe: 1, São Paulo: 4, Tocantins: 1.

Participants completed two questionnaires. The first one included 10 questions to gather information about their background (see Table 1). The second one was a longer questionnaire that was used to collect data for a larger project regarding pronunciation teaching and teacher education, coordinated by the first researcher. In this study, we will analyze the questions for the second part of the second questionnaire, more specifically, the questions from Section 4, which inquired about pronunciation teaching and the use of digital resources. This section contained eight questions which intended to examine: (a) what the participants recognize as relevant digital resources for pronunciation teaching and students' learning; (b) the role played by digital technologies in their pronunciation teaching practices; and (c) their perspectives on the affordances and limitations of digital technologies for pronunciation teaching.

Questions 1, 4, 7 and 8 were closed, but question 1 allowed selecting multiple items, while the others forced the participants to choose one of the response options or type an alternative response. Questions 2, 3, 5, and 6 were open questions intended to provide the participants with more freedom to express their perspectives regarding affordances and uses of digital resources for pronunciation teaching.

Question 1 listed digital resources and asked the participants to select the one(s) they considered to be relevant to teach pronunciation, and they could also type the name of other resources that they considered relevant. Question 2 asked whether the participants found it easier to teach pronunciation with the support of digital resources. On the other hand, question 3 inquired if the participants considered that digital resources facilitated pronunciation learning. As for question 4, it inquired whether the participants used digital resources to teach pronunciation in their classes, and provided them with four response alternatives: *yes*, *sometimes*, *no*, *I don't teach pronunciation in class*. Questions 5 and 6 were made available so that the participants could provide further details about their answer to question 4, which, as explained previously, was a multiple-choice question inquiring if the participants used digital resources to teach pronunciation. Question 7 was also multiple-choice, and it asked the participants to explain how much their undergraduate degree had prepared them to use digital resources to teach pronunciation. There were five response options: *yes*, *no*, *partially*, *I don't use technological resources to teach pronunciation*, *I don't teach pronunciation*. Finally, question 8 inquired about how often the participants recommended the use of digital resources for their students to learn about pronunciation. Here they had three response options: *always*, *sometimes*, *never*.

2.3. Procedures for Participants' Recruitment and Data Collection

This study is part of an umbrella project coordinated by the first author and it was approved by the Ethics board of the university where the research took place[5]. The participants were recruited over social media advertisement offering the opportunity to participate in a free online pronunciation teaching workshop and to contribute to the study by completing online questionnaires. The ad included a link to a Google Form where they could read a consent form providing details about the research. If they agreed with the terms of the research, they clicked on a specific button in the form and were directed to complete the Background Questionnaire. In this questionnaire, they entered their email address, which was used later to contact them and provide information about the free pronunciation workshop and their participation in the study.

Prior to beginning the pronunciation workshop, the participants received a link to another Google Form containing a four-section questionnaire that aimed at gathering information about (a) how their education background had prepared them to teach pronunciation, (b) their cognitions, beliefs, and practices regarding pronunciation teaching, and (c) their perspectives on pronunciation teaching with the support of digital resources. In the present study, we analyzed data from the background questionnaire and questions from the section about digital resources (c) only. It is important to explain that the participants' provided further data by completing activities during the online workshop and a final questionnaire that was administered after the workshop finished. However, these data will not be analyzed in the present study. Participants took their time to answer all the questionnaires without any supervision. Their participation in the study was expected to take about 17 hours, with 15 hours dedicated to attending the pronunciation workshop and a maximum of two hours to complete all the three online questionnaires.

2.4. Data Analysis

The data were previously inspected to verify that all the respondents of the questionnaires fulfilled the requirements for this research. At this stage, we found six participants who did not meet all the requirements and their data had to be discarded. The next step was to organize all the dataset in Excel spreadsheets, creating categories of analysis whenever possible, assigning numbers to categorical variables that could later be analyzed with the help of descriptive statistics,

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[5] CAAE 30855120.0.0000.0121, Review: 4.194.816.

and copying and pasting open responses for the open questions provided by the participants. The relevant data for this study were retrieved from two spreadsheets and were then imported to the statistics package SPSS to run descriptive statistics. To obtain the graphs that summarize the results, we used Excel.

The background questionnaire data were used to generate descriptive statistics and frequency tables to provide us with an overview of the education background, the teaching experience and personal data from the participants who contributed to the study (see Table 1). The eight questions that inquired about digital resources and pronunciation teaching were analyzed quantitatively and qualitatively in order to answer the research question guiding this study. Closed questions were coded with numbers and frequency tables for each response option and graphs were obtained to summarize the results. Open questions were analyzed to search for response patterns, which were then displayed in charts in order to summarize the responses provided by the participants.

5. Results and discussion

This study aims at examining the affordances of digital resources to teach pronunciation from the perspective of in-service Brazilian teachers of English. The results of the survey administered to 42 teachers are organized into two main sections. In the first one, we examine what participants regard as relevant digital resources for pronunciation teaching and learning, how often they use these resources to teach pronunciation, and how their use of digital resources for pronunciation teaching is based on information received while they were pursuing their undergraduate degree (Q1, Q4, Q5, Q6, Q7, and Q8). The second section reports on the results regarding teachers' perspectives on the efficacy of digital resources for pronunciation teaching and learning (Q2 and Q3). We finish the section by discussing the results and providing a thorough answer to the research question.

5.1. Digital resources for pronunciation teaching

Question 1 listed a number of resources and asked the participants to select all the items they regarded as being relevant for pronunciation teaching, and they were also able to type the name of other resources. Table 2 Displays the number of participants who selected each of the resources listed in Question 1.

Table 2 – Digital Resources Listed by the Participants

Computer	Cellphone	Apps	Software	Blogs	Podcasts	Video
35	34	39	26	22	35	36

N=42

Source: Authors

As shown in Figure 2 from the seven resources listed, most participants selected apps (92,9%), videos (85,7%), computers (83,3%), podcasts (83,3%) and cellphones (81%). The least selected resources were software (61,9%) and blogs (52,4%). Note, however, that the seven types of resources are used by at least about 50% of the teachers. Two participants added information in the "others" option, specifying that they use movies, music and TV series as important pronunciation teaching resources. The items listed by some teachers are actually common visual and auditory support features that are embedded in many digital resources (see Chart 1).

Figure 2 – Digital Resources Regarded as Relevant for Pronunciation Teaching by Participant-Teachers
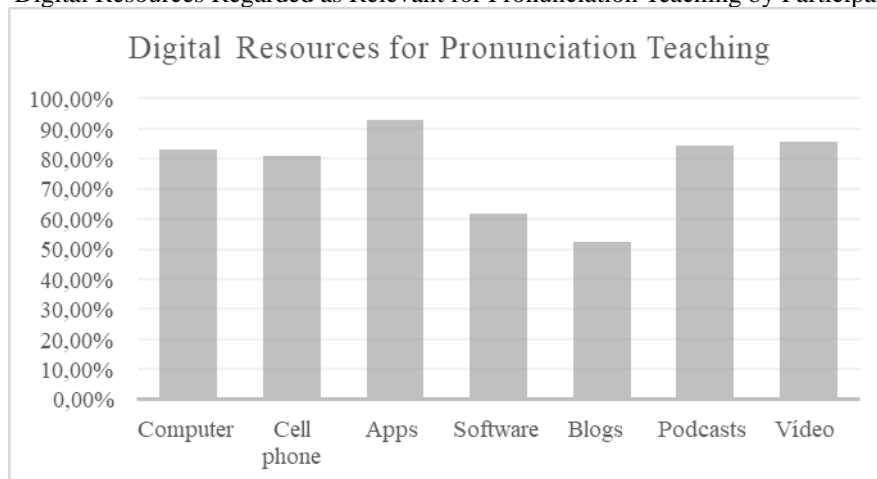
Source: Authors

Question 4 asked how often teachers use digital resources to teach pronunciation. As Figure 3 shows, nearly all teachers (41) use digital resources to a certain extent, with 21 of them (50%) reporting always using these resources, 20 (47,6%) affirming they use them sometimes, and only 1 (2,4%) reporting not using digital resources to teach English.

Figure 3 – Participant-Teachers' Use of Digital Resources for Pronunciation Teaching
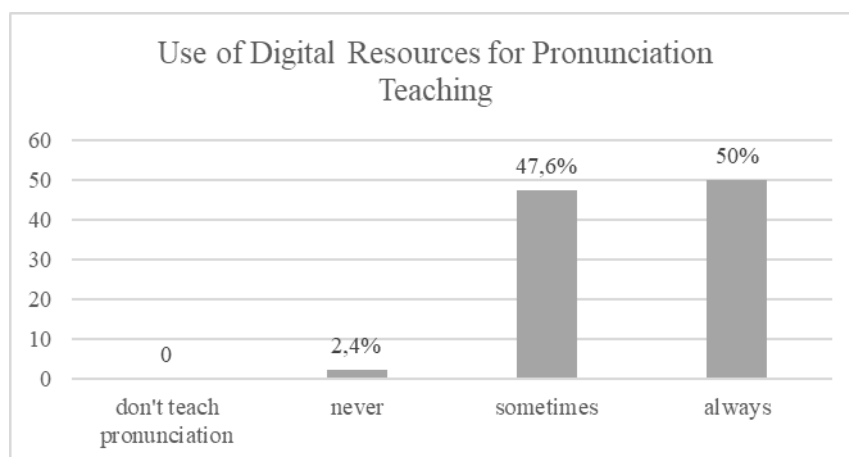
Source: Authors

Questions 5 asked the participants who answered 'sometimes' or 'never' to justify their answers regarding the frequency of use of digital resources for pronunciation teaching. We also asked them to explain what prevents them from using digital resources and/or provide examples of digital resources they use for pronunciation teaching. As these were open questions, not all participants provided answers. Among the 20 teachers who answered 'sometimes', 18 provided answers, and the only participant who answered 'never' also presented reasons for not using digital resources for pronunciation teaching. Thus, for this analysis, the sample size equals 19 participants.

Among the explanations about why digital resources are not used, or are used sometimes in class, we would like to highlight some responses provided by the teachers, summarized in Table 3. As can be seen, the most common reasons mentioned by the participants are that pronunciation teaching is not necessary in their teaching context (8 teachers), that they lack access to technology in their teaching context (7 teachers), or that they lack knowledge about how to use digital resources (5 teachers).

Table 3 – Participants' Justification for not Using Digital Resources for Pronunciation Teaching

Not necessary	8 (42.1%)
Lack of access to technology in the classroom	7 (36.8%)
Lack of knowledge about resources	5 (26.3%)
Lack of time to work with pronunciation	3 (15.7%)
Lack of knowledge about pronunciation	1 (5.2%)

N=19

Source: Authors

Question 6 was open and asked all 42 participants for examples of digital resources used to

teach pronunciation. A total of 38 participants provided answers. We organized the responses using the three categories of digital learning resources proposed by the Creating Educational Technology for English Learners (2018) website, namely, digital academic tools, digital productive tools, and digital communication tools.

Table 4 shows that, within the digital academic content tools, teachers refer very often to supporting features that contain video and/or auditory information that contribute to pronunciation teaching (videos (50%), audio tracks (21%), and songs (13%)). Additionally, they mention using resources such as websites (45%), apps (32%), software (16%), podcasts (16%), blogs (8%), online dictionaries, Google Translator, and textbook digital companions (5% each). Turning to digital productivity tools, teachers often refer to their use of notebooks and computers (21%), sometimes specifying the use of some tools such as browsers, word-processing, slide presentation, media players, or even an interactive board. Finally, for digital communication tools, teachers report using smartphones (14%), and only one mentioned the use of WhatsApp (3%).

Table 4 – Digital Resources Used by in-Service Teachers

| Classification of Digital Resources	Type cited	Percentage
Digital academic content tools	Apps	32%
	Software	16%
	Websites (IPA tools, YouTube, online games)	45%
	Blogs	8%
	Podcasts	14
	Online dictionaries	5%
	Google Translator	5%
	Textbook digital companion	5%
Supporting features	*Videos (films, TV shows, animations)*	50%
	Songs	13%
	Audio tracks	21%
Digital productivity tools	Notebook/computer (browser; word-processing software; media players; slides presentation, interactive board)	21%
Digital communication tools	Smartphones	16%
	WhatsApp	
		3%

N=38

Source: Authors

Based on the results displayed in Table 4, we can see that the participants of this study resort more often to digital academic tools to teach pronunciation, with an emphasis on resources or features that provide pronunciation-related content to their students, especially in the form of video and auditory supporting features, and practice with phonetic symbols and target sounds.

Complementing this question, we asked teachers whether they recommended digital

resources for their students to learn pronunciation. Three response options were provided: *never*, *sometimes*, *always* (Q8). Figure 4 shows that 55% (19) of the participants stated that they always recommend digital resources to their students, followed by 45% (23) who reported doing so sometimes. These results seem to mirror those obtained for Question 4 (see Figure 3), in which teachers reported their use of digital resources for pronunciation teaching.

Figure 4– Participant-Teachers' Recommendation of Digital Resource for Pronunciation Self-Study
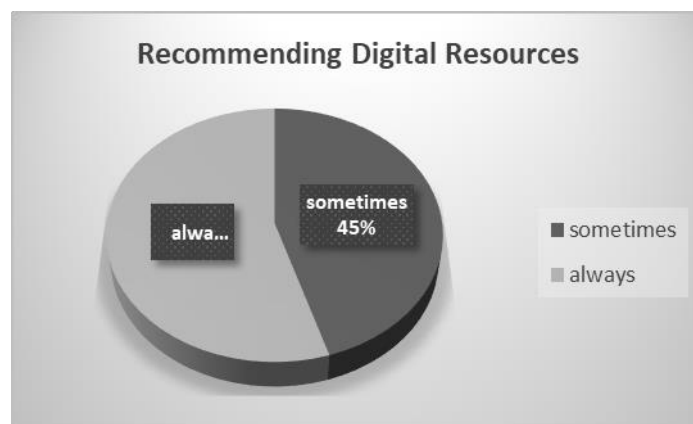
Source: Authors

Question 7 inquired whether the participants' use of digital resources for pronunciation teaching is based on information received while they were pursuing their undergraduate degree. Five response options were provided: *yes*, *partially*, *no*, *I don't use technology*, *I don't teach pronunciation*. As displayed in Figure 5, from the 42 participants, most reported basing their pronunciation teaching with digital resources on information gathered from their experience as *Letras* majors, with 16 (38,1%) of them selecting the 'yes' response and 16 (38,1%) selecting the 'partially' response. On the other hand, 8 (19%) of the participants reported they do not base their pronunciation teaching with the support of digital resources on what they learned as undergraduate students, which we might interpret as an absence of discussion of the role of digital resources in connection with pronunciation teaching in the curricula of their undergraduate/graduate degrees. Two teachers (4,8%) reported not using technology at all.

Figure 5– The Role of Participant-Teachers' Education in their Use of Digital Resources for Pronunciation Teaching
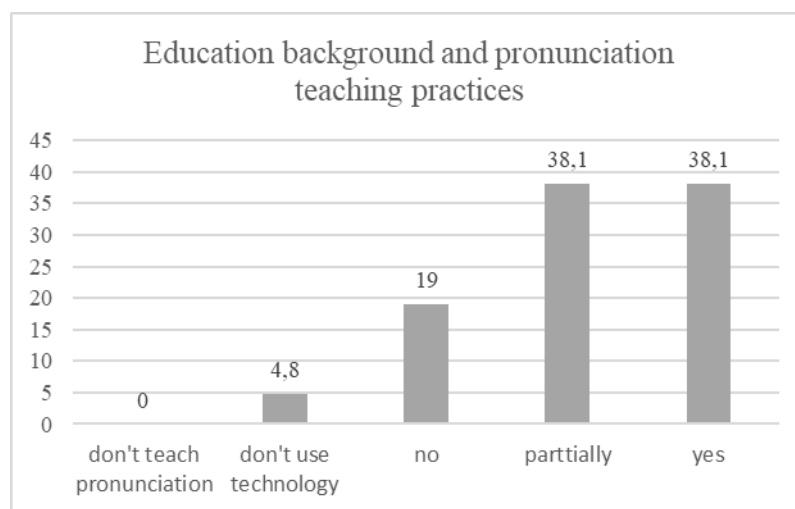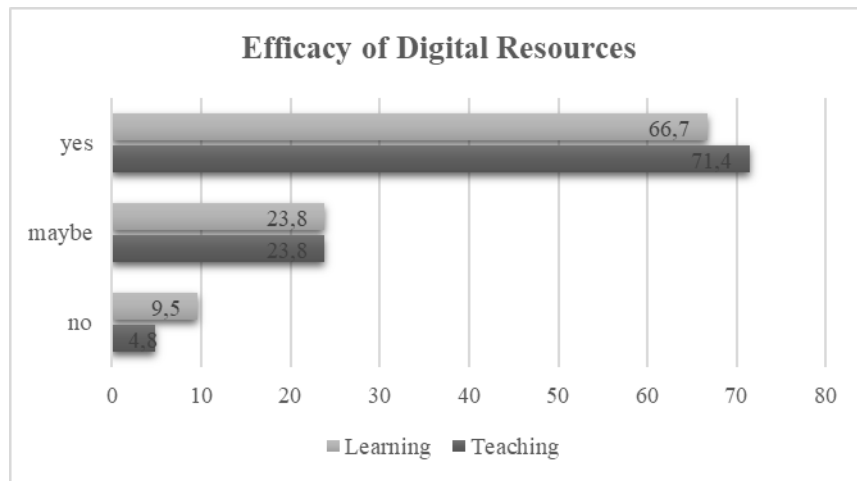
Source: Authors

To understand better why a few participants stated that they do not use technology in their teaching practices, we returned to the open responses provided by these participants to Questions 5 and 6. According to one of these teachers (T20), the context where she teaches does not require using technology or teaching pronunciation (entrance exam preparation course), while the other (T41) stated that she lacks knowledge of relevant digital resources to employ them in her practice.

5.2. Efficacy of digital technologies for pronunciation teaching and learning

Aiming at gathering teachers' opinions about the use of digital resources for pronunciation teaching and learning, we included two open questions in the questionnaire. Question 2 asked the participants whether they considered that pronunciation teaching becomes easier with the help of digital resources and why. Similarly, Question 3 inquired whether they believed that students learn about pronunciation more easily when they are taught with digital resources. Based on what the teachers wrote, we classified the responses as being affirmative, negative, or indecisive (in Figure 6, these responses appear as *yes*, *no*, *maybe*, respectively). All 42 participants provided answers to these questions. As can be seen in Figure 6, 30 (71,4%) participants believe that digital resources facilitate pronunciation teaching and 28 (66,7%) believe it facilitated pronunciation learning, while 10 (23,8%) believe that these resources may facilitate teaching and learning. Conversely, only 2 (4,8%) participants seem to be more skeptical about the efficacy of digital resources for pronunciation teaching, and 4 (9,5%) doubt the efficacy for pronunciation learning.

Figure 6 – Participant-Teachers' Opinion about Efficacy of Digital Resources for Pronunciation Teaching and Learning

Efficacy of Digital Resources

	Learning	Teaching
yes	66.7	71.4
maybe	23.8	23.8
no	9.5	4.8

Source: Authors

In order to understand better both the positive, the indecisive, and the negative responses, we examined some of the answers provided by the participants. We attempted to summarize the content of the open questions by selecting recurrent words and phrases used by the participant-teachers with the purpose of illustrating their positive, indecisive, or negative responses, as displayed in Charts 2 (teaching) and 3 (learning).

Starting with the answers about the efficacy of digital resources for pronunciation teaching, Chart 2 shows that most comments highlight positive aspects of digital resources for pronunciation teaching, even if we look at the column with indecisive responses, that is, those teachers who see both qualities and limitations of digital technologies regarding pronunciation teaching efficacy. Among the positive responses, the teachers use words such as familiar, attractive, engaging, practical, dynamic, diverse, also emphasizing the fact that digital resources intensify the contact with the language and with diverse pronunciation models. Among the negative responses, some teachers ponder that despite the affordances of technologies, they still lack possibilities for real interaction and are highly dependent on teachers' knowledge and students' commitment to the learning process to be effective, not to mention that in some teaching contexts, access to technology is still limited.

Chart 2 – In-Service Teachers' Comments about Digital Resources Efficacy for Pronunciation Teaching

Positive comments	Indecisive comments	Negative comments
Familiar; attractive; diverse pronunciation models; easier to approach intelligibility; practical, further contact with L2; diverse resources and activities; engaging; dynamic; entertaining; motivating; multimodal resources; easier to access information; feedback, practical; contact with native speakers; correct pronunciation; self-study.	Further contact with L2; more effective with teachers' guidance; guided practice but lacking interaction; lack of students' practice; enhancing explanation; useful and attractive but not essential; teachers' knowledge required; diverse resources, but not necessarily better.	Time-consuming content selection; limited familiarity and access.

Source: Authors

Turning to the comments about the efficacy of digital resources for pronunciation learning, Chart 3 shows that there is a similarity in the responses displayed in Chart 3. However, we see some different responses that are more connected with learners' individual differences, especially regarding learning styles, attention, and emotions experienced by L2 learners, such as anxiety and motivation. Varied learning styles and the need for teachers' guidance or mediation are highlighted by the teachers who provided indecisive responses for the question about the efficacy of digital resources in pronunciation learning. The negative responses were complemented with comments on how technology can be distracting for young kids and demands mediation by a teacher, how the limited feedback it provides can hinder motivation, how it differs from real language use, and how some learners have limited access to digital resources.

Chart 3 – In-Service Teachers' Comments about Digital Resources Efficacy for Pronunciation Learning

Positive comments	Indecisive comments	Negative comments
Higher motivation; lower anxiety; attractive; engaging; enhanced contact; self-study; extended practice; ubiquitous; different accents; dynamic interaction; clear model; practical; audio quality and access; students' autonomy; familiarity; authentic learning.	Varied learning styles; requiring teachers' guidance and expertise; not essential; complementary practice.	Distracting for young kids; limited feedback; not real language use; limited access.

Source: Authors

5.3. Digital Resources Affordances – In-Service Teachers' Perspectives

Different from previous studies investigating Brazilian teachers of English (Buss (2016), Costa (2016), Haus (2018), Camargo (2020), most participants in the present study reported they teach pronunciation in their classes and that they feel prepared to do it. We can speculate that the 42 teachers who joined the present study are professionals that were already willing to include the pronunciation component in their classes, different from the teachers investigated in the previous studies. Notably, the recruitment of the participants for the present study might have attracted teachers who were highly interested in pronunciation teaching, given the fact that they were offered the opportunity to attend an online pronunciation workshop as well.

Most teachers reported making use of digital resources, thus indicating that these resources are clearly present in the English classrooms in Brazil. This introduction or maybe consolidation of digital resources use might have been favored by the pandemic that has impacted the teaching practices of the research participants, given that this study was conducted in the second semester of 2021, that is, over one year after the Covid-19 pandemic has forced educators around the world to implement remote learning. Nonetheless, a reasonable number of participants reported that their education background has not provided them with sufficient information about how to integrate digital resources in their pronunciation teaching practice.

Among the categories of digital resources investigated here, and that were proposed by the American Office of Educational Technology Website (2018) to implement the use of educational technologies for language learners, the participants highlighted the use of supporting features containing visual and auditory information (videos, movie scenes, TV shows, animations, audio tracks, and songs). Equally relevant for the participants was the use of digital academic content resources that allow access to content related to English pronunciation, such as websites, apps, blogs, podcasts, software, and dictionaries. Conversely, digital productive tools and digital communication tools were less often mentioned by the teachers, as these participants seem to

emphasize the use of digital resources that promote access to pronunciation content aided by visual and auditory supporting features. Apparently, these teachers are more likely to select materials that are suitable for pedagogical purposes, such as websites, apps, blogs, and software containing information about pronunciation or perception-level activities with immediate feedback options, as well as materials containing visual and/or auditory features that can be easily adapted to help them provide students with examples and extended comprehension, perception and production practice.

Most teachers show awareness about affordances and limitations of digital technology for pronunciation teaching and mention important ones highlighted in the literature (HINCKS, 2018; CUCCHIARINI; STRIK, 2018, PENNINGTON; ROGERSON-REVELL, 2019; ROGERSON-REVELL, 2021); BALDISSERA; TUMOLO, 2021). Among the affordances, Brazilian teachers explain that digital resources can contribute to pronunciation teaching and learning because they can immerse students in activities that are already familiar to them, given the frequent use of digital technologies outside the classroom. This fact means that teaching pronunciation with digital resources can make the classes more attractive, boost students' motivation to learn about pronunciation, in addition to favoring opportunities for autonomous learning (BALDISSERA; TUMOLO, 2021; ROGERSON-REVELL, 2021). From the teaching point of view, the teachers highlight the fact that digital resources make it easier to have access to and present diverse pronunciation models and emphasize the role of speech intelligibility and variation when teaching pronunciation (LEVIS, 2005; 2020). Furthermore, teachers regard digital resources as allies to make their classes more engaging, dynamic, and entertaining, as they allow easier access to content with multimodal resources. A few teachers also commented on the fact that digital resources help provide feedback to students' pronunciation when teaching specific sounds and using activities focusing on speech perception or introducing the phonetic alphabet. A small number of teachers mentioned that digital resources allowed them to provide the 'correct' pronunciation of words to students, which may be interpreted as a sign that these teachers may feel insecure about their command of English pronunciation and about using their speech as a model in the classroom, or even that they still have accuracy as their guiding principle for pronunciation teaching, rather than intelligibility (LEVIS, 2005; 2020).

Conversely, some teachers also emphasized important limitations of digital resources. On the one hand, taking into consideration the students' perspective, they noted that digital resources can be distracting for young kids, offer limited feedback and do not equate to real

language use. Besides, they highlighted the fact that, in the Brazilian context, limited access to technologies is still a reality in many classrooms and households, a fact that is corroborated by a survey carried out by *Centro Regional de Estudos para o Desenvolvimento da Sociedade da Informação* (CETIC, 2020), which shows that only 61.8% million Brazilian households have access to some type of network connection. Further evidence of the limited access to technologies is provided by the report published by the Censo da Educação Básica (Brasil, 2021), which brings data about the availability of technological resources and internet access at schools all over Brazil in 2020 and shows how the situation differs across regions and types of school.

On the other hand, when considering teachers' practice, a few participants pointed out that using digital resources can represent an extra burden to the teacher, who needs time and knowledge to select relevant content. This also becomes an issue when teachers themselves have limited access to technological resources and familiarity with their use. Thus, a number of participants stressed the fact that digital resources are highly dependent on teachers' skills and that their efficacy depends on combining them with appropriate pedagogical practices for pronunciation teaching (PENNINGTON; ROGERSON-REVELL, 2019; ROGERSON-REVELL, 2021).

Conclusion

The present study examined in-service English teachers' perspectives on the affordances of digital resources for pronunciation teaching. For this purpose, a survey with 42 Brazilian teachers of English was conducted during a time when the integration of technology and language pedagogy has experienced an unprecedented increase, due to the restrictions that the Covid-19 pandemic has imposed on education around the world.

It is likely that the circumstances in which the present research was conducted may partially account for the findings of the present study. Our results show most teachers who contributed with data are aware of both affordances and limitations of digital resources when it comes to pronunciation teaching. Similarly, we found that most of the teachers contributing to this study report being willing to teach pronunciation in their classrooms, and that they very often resort to digital resources when teaching it. Notably, these teachers favor the use of multimodal supporting features that can be embedded in digital resources such as websites, apps, blogs, software, and podcasts, that is, they show a preference for selecting digital resources that contain information about English pronunciation features or supporting features that help them provide students with an array of speech samples and pronunciation models.

Although the results in general show a very positive attitude towards pronunciation

teaching with a focus on intelligibility and an appreciation for different accents, a few comments related to how digital resources allow showing the "correct" pronunciation suggest that having accuracy and a native speaker standard pronunciation as the single goal for pronunciation teaching is still an issue to be addressed in the curriculum of English *Letras* programs. Likewise, many participants' responses indicated that their education background has not prepared them sufficiently to work with digital resources when teaching pronunciation.

Due to the nature of the participants' recruitment method used in this study, we can assume that we collected data from teachers who hold a positive opinion about pronunciation teaching and that demonstrate confidence in their ability to teach pronunciation, which certainly does not represent the perspective of all English teachers in Brazil. Additionally, the fact that this study is limited to questionnaire data does not allow us to have information about how, when, and how often pronunciation teaching takes place in classes taught by the participants. Thus, we cannot make any assumptions about teachers' practice regarding pronunciation teaching.

Further studies should investigate the perceptions of teachers that hold different opinions and cognitions about pronunciation teaching and the role of digital resources, in addition to including classroom observation to gain further insight about how pronunciation is implemented in real classrooms.

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