The vowel matrix: Enhancing literacy development through an innovative approach to teaching pronunciation

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The development of effective oral communication skills is a high priority for beginner-level, adult English language learners, and clear pronunciation is an essential part of this development. The perception and production of English vowel sounds can be a particularly challenging area of pronunciation for beginner-level learners. If adult learners are also preliterate, this aspect of pronunciation may require explicit teaching, as phonological awareness can be linked to literacy development. However, relatively little has been documented on teaching pronunciation to lower-level proficiency learners. Inspired by haptic (movement + touch) pronunciation instruction, this paper describes the Vowel Matrix, an innovative means used to teach aspects of pronunciation to a class of preliterate adult learners from Arabic-speaking backgrounds in Australia. We discuss how the Vowel Matrix can support learners’ literacy development by drawing their awareness to short vowel sounds in newly learned vocabulary using gesture, movement, and touch. Following this, practical teaching suggestions are made to enhance literacy development.

Introduction
In Australia, newly arrived adult migrant and refugee-background learners can develop foundational English language skills through participation in English language and settlement programs offered in regional and urban areas. As a result of forced migration and interrupted schooling, some of these learners may not have had opportunities to develop literacy skills in either their first language (L1) or English. However, acquiring both the English literacy and spoken communication
skills necessary to negotiate ways through new educational, employment, and social settings is a high priority for adult learners seeking to integrate into new communities (Yates, 2011).

One important aspect of oral communication skill development is pronunciation, which has links with phonological awareness and hence, literacy. There is evidence to suggest that literacy in either an L1 or a second language (L2) affects how oral input is processed (Heuttig et al., 2018). Second language acquisition research with preliterate adults has also noted that some learners may not have developed the strategies needed to link letters with their sounds (Tarone, Bigelow & Hansen, 2013). Teachers of this cohort may be better equipped to assist their students to improve both L2 English pronunciation and literacy skills if they develop a deeper understanding of how students with little exposure to print literacy process oral language.

The present paper seeks to expand the currently scarce classroom-based literature on pronunciation teaching with beginner-level learners of English (Echelberger et al., 2018), by describing a pronunciation teaching technique used to teach adult preliterate students pronunciation of English vowel sounds. This is an area which many L2 English learners typically find challenging (Thomas, Knowland & Rogers, 2020). Inspired by haptic pronunciation teaching (Acton et al., 2013), the Vowel Matrix was adapted and used by the first author (Skye) to support her learners’ literacy development, raise their awareness of how vowel sounds correspond to spelling in English, and increase their understanding of the relationship between word stress and vowel clarity.

**Context and Learner Needs**

The teaching context in which this paper was situated was a vocational training institution in Australia. Enrolments in the English language program offered at this college had grown as refugees continued to settle into the area. Families from Syria and Iraq formed the largest proportion of the current beginner English language learner cohort. At the institution, the class of three male and 17 female preliterate refugee-background Kurdish and Arabic speakers participated in a government-funded English language program which enabled them to receive over 500 hours of English language tuition soon after their arrival in Australia. The students were aged between 18 and 24, and had 1-7 years of formal education in Arabic. As all the students were over 18 with low English language proficiency and literacy, their educational pathway in Australia would not include participation in a mainstream high school. Instead, the focus for these students was to become confident users of English in order to transition to further training and employment on completion of their English language course at the college.
Some of the challenges of teaching oral communication skills with the young adult class described in this paper included the students’ apparent lack of confidence or willingness to speak in English. Factors contributing to this could have been cultural expectations of individually speaking up in class, backgrounds of trauma, unfamiliarity with new teaching styles and teacher expectations (DeCapua, 2018), or being in a class of learners who spoke their L1. These factors diminish the learners’ perceived need to practise speaking English in order to be understood by their peers. However, students were highly engaged in activities which involved movement and singing, often spending break times in the classroom dancing and singing to familiar Kurdish music. Skye, their teacher, also used short English songs to teach phrases or vocabulary each lesson, and students could sometimes be heard singing sections of these songs at other times, to remind themselves of a particular word or phrase. Given that song, dance, and oral teaching of historical and religious texts were important in the students’ community (Allison, 2001), it seemed reasonable to assume that learning which connected with their cultural backgrounds increases their engagement and confidence to speak in English (Farrelly & Fakhrutdinova, 2020).

In addition to increasing student engagement, confidence, and connection with students’ cultural backgrounds, Skye’s decision to explore pronunciation teaching techniques which focused on the perception and production of English vowels stemmed from observations of the students’ challenges with vowels. They struggled to differentiate between vowel sounds in listening texts, confused these sounds when reading words, and often left out or inserted incorrect vowels when writing familiar vocabulary. The students’ confusion seemed consistent with research suggesting links between literacy and oral language (Tarone, Bigelow & Hansen, 2013). A lack of literacy affects phonological awareness (i.e., the understanding that discrete sounds make up spoken language) (Gillon, 2018), with research suggesting that even a little exposure to print literacy offers adult learners ‘a strategy for visualising encoded oral language’ (Bigelow & Watson, 2012, p. 463). The preliterate students in Skye’s class were not linking the new English vowel sounds they were hearing to previously established visual codes, and this made the pathway to English literacy challenging for them. Research on adult literacy has suggested that kinesthetic (i.e., body-based) learning can support visual recognition (Thomas, Knowland & Rogers, 2020), and so exploring this connection in relation to pronunciation instruction was an area that Skye was keen to explore with her class.

Finally, any formal schooling the learners had received had been in Arabic, and, therefore, developing proficient sound-spelling awareness of English vowels proved challenging for them. Arabic has fewer vowels than English, and vowels may be omitted in written Arabic with readers not needing to rely on ‘vowel information’
(Saigh & Schmitt, 2012, p. 26) in order to understand what has been written. Instead, readers rely on other contextual and morphological information to comprehend the text. Some studies have suggested that, when reading English, Arabic L1 speakers may develop a ‘mental representation’ (Saigh & Schmitt, 2012, p. 27) of a word that relies more on its consonants rather than vowels and therefore readers could be processing English words in ways that overlook the vowels in the word (Abu-Rabia, 2002).

In this paper, the focus is on monophthongs (i.e., short vowels) most relevant to the learner group discussed (even though the English vowel system is more comprehensive than just monophthongs). The decision to introduce these short vowels was made for two reasons. Firstly, they are introduced in single-syllabic words found in high-frequency word lists commonly taught in beginner-level adult classes to assist literacy and vocabulary development (Nation, 2013). Secondly, from a pronunciation teaching perspective, explicitly teaching vowels to beginner-level students is supported in literature which emphasises the need to teach ‘the clarity of the vowel in the stressed syllable of the most important word in a phrase, the focus word’ (Chan, 2018, p. 3). It was against this backdrop that the decision was made to draw on haptic pronunciation instruction, described in the following section, in order to develop the students’ awareness of English vowels. In doing so, it was hoped that students’ attention would physically and cognitively be drawn to spoken text, and this would then assist them to link spoken to written text.

Haptic Pronunciation Teaching and the Vowel Matrix

Haptic pronunciation teaching uses a systematic combination of movement, touch, and gesture to introduce and enhance retention and production of phonological features (Acton et al., 2013). Research into haptic pronunciation teaching is growing, especially in the area of L2 teachers’ uptake of haptic instruction in teacher education programs (Burri & Baker, 2019), and classroom usage of haptic pronunciation teaching has been described in teaching contexts with mostly advanced learners of English (Burri, 2014; Burri et al., 2019; Kielstra & Acton, 2018). Yet, little literature to date has described the application of haptic teaching with classes of beginner-level L2 learners.

Pedagogical movement patterns (hereafter PMPs) in haptic pronunciation teaching refer to systematic hand gestures which move across an individual’s visual field. These PMPs are then ‘anchor[ed] with touch’ (Acton et al., 2013, p. 237) through hands contacting each other at the same time as the peak vowel (and stressed syllable) of a word. Touch – perhaps the least explored of all the senses in language teaching – has been shown to produce and enhance memory and learning (Hutmacher & Kuhbandner, 2018; Shaikh et al., 2017). The types of touch involved in haptic PMPs
vary as they are intended to highlight different aspects of pronunciation (e.g., a short, sharp hand tap corresponds to a single, short vowel sound). This paper introduces the PMPs for eight monophthongs and a framework in which the vowel PMPs are situated. This framework is termed the Vowel Matrix and, as shown in Figure 1, is represented as a clock-like figure to aid the process of students learning the eight monophthongs.

Figure 1. Australian monophthongs on the Vowel Matrix

A demonstration of the eight vowel sounds described in this article is found in the following video: https://youtu.be/533FdYUiS5Y. As can be seen in the video, one hand remains open in its position in the teacher’s visual field (i.e., the area that can be seen while the eye is focused straight ahead on one point). The opposite hand moves across the body towards it and gives the open hand a sharp tap with the second and middle finger. Visually, the process of anchoring sounds to memory is facilitated by linking them to positions arranged in a clock-style formation (Acton, 2012; Burri, 2014). The numbered positions on the clock correspond to positions on the body. So, for example, when demonstrating the PMP for 2 or 10, the stationary hand will be set at the eyebrow level; for positions 4 or 8, at the deltoid level; for 5 or 7, at the level of the solar plexus; and for 6, at the level of the navel.

Students will observe and then follow the teacher’s PMPs in mirror-image, so teacher practice of the positions in the Vowel Matrix is needed to develop confident
modelling of the PMPs (e.g., for /ɪ/, the teacher uses the right hand near the right eyebrow level, but students facing the teacher mirror this and use their left hand near the left eyebrow, making sure their PMP corresponds with the Vowel Matrix in Figure 1). This mirroring allows the teacher to guide the students in moving their hands to the correct positions within the Vowel Matrix. It is important for a teacher to consistently and accurately model and draw students’ attention to the position and type of touch of the target PMP demonstrated. Once the class is familiar with a PMP, corrective feedback using a PMP to draw students’ attention to a difference in vowel production can become a positive aspect of the learning process for students, as they begin to engage in noticing similarities and differences between English vowel sounds and those in their L1. For example, if a word is mispronounced, students can receive a visual and auditory cue from a teacher demonstrating the PMP of the correct vowel sound, thus offering a quick non-verbal opportunity for self-correction.

**Practical Teaching Suggestions**

The introduction and building of new vocabulary, and then connecting it to pronunciation, is an essential step for preliterate adult learners, with some researchers positing that learners who have developed strong word-recognition skills show more success in their development of reading comprehension skills (Kurvers, 2015). High-frequency word lists can be used to introduce beginner-level L2 adult learners to new words which will assist their ability to produce spoken language and comprehend reading texts (Nation, 2013). The list Skye used with her class aligned with word lists used by other teaching colleagues in the educational facility (see, e.g., https://sightwords.com/sight-words/fry/). Students in this class were introduced to vocabulary progressively throughout each teaching term, reviewing each word, its meaning and the relevant vowel PMP weekly. Nation (2013) emphasises the need for students to engage in explicit learning of high-frequency vocabulary through the use of teaching resources such as word cards. As new words were introduced to the class, they were placed on a class Word Wall (see Figure 2). The Word Wall was then kept in place throughout the term, as students referred to it during various activities. It was a useful teaching tool to draw their attention to the spelling or pronunciation of words encountered in listening and reading texts. The Word Wall
list also provided a useful resource for classroom games and other activities, as described in the section below.

![Word Wall example](image)

**Figure 2. Example of high-frequency words compiled in a ‘Word Wall’ list**

While the use of high-frequency word lists is not uncommon in beginner English language classes, words on these lists have been ordered according to frequency of usage and are often taught with rote memorisation strategies as ‘sight words.’ From a pronunciation teaching perspective, an initial phase of accurate awareness of sound differences is essential (Chan, 2018). With this in mind, therefore, the Word Wall vocabulary was introduced and ordered according to the monophthongs which formed the peak vowels of each word (Gilbert, 2008). This aimed to visually reinforce the vowel sound in each word, and facilitate students’ awareness of vowel contrasts. PMPs of vowels which matched front and back vowel sounds (e.g., /ɪ/ and /ʊ/) were introduced in the same teaching session to highlight the contrast between the two vowels. One reason for this was that the learners found it difficult to differentiate between /æ/, /ʌ/, and /ɑː/. By introducing and highlighting how the PMPs for these vowel sounds corresponded to different sides of the visual field (i.e., left and right sides), the teacher aimed to draw students’ awareness to these differences. Once familiarity with the Word Wall had been established, it became a helpful classroom resource and reference list. For example, during a guided reading session, the teacher drew students’ attention to Word Wall words which were encountered in class reading texts. Students also worked with a partner to find Word Wall words in similar reading texts, and say these aloud to each other.
Other activities which drew students’ attention to the peak vowel in words on the Word Wall or in different reading texts containing known high-frequency words included those which used a PMP as a prompt to identify a word. This was initially a teacher-directed activity. The teacher modelled prompting word recognition through a PMP as a whole-class activity and asked individual students to identify which word in a target sentence, for example, contained that sound. As a class game, students took turns to guess which word the teacher had secretly chosen, using the PMP and peak vowel to guide their choices. With large classes, this can be effective as a small group game, where students quietly discuss their choice as a group, and the teacher allows a spokesperson from each group to offer their group’s choice before revealing the answer to the whole class. One of the advantages of this style of group guessing game is that it minimises a focus on an individual student choosing a right or wrong answer; hence, reducing the risk of student embarrassment or pressure. Once students are familiar with the activity, those who are more confident can take the place of the teacher in this guessing game. It is important to encourage a sense of fun rather than competition in any games with beginner-level adult learners, and to give students the opportunity to opt out of participating if they feel uncertain or embarrassed. Pressure to perform in front of peers and a teacher can cause unnecessary stress (DeCapua, 2018), and students who feel vulnerable and pressured do not need to be put in the spotlight until they express a desire to do so.

A final suggestion for incorporating the use of the Vowel Matrix in pronunciation teaching with beginner-level preliterate learners is in the area of corrective feedback. Providing feedback on students’ pronunciation can be challenging for teachers of English language learners at all levels (Baker & Burri, 2016). In the teaching context described, using the PMPs to draw students’ attention to vowel differences was found to be an effective approach to the provision of corrective feedback. For example, in whole-class activities which incorporated introduction or review of vocabulary, a PMP was used by the teacher to draw attention to a vowel which she heard mispronounced. The teacher can, for instance, pause during a reading passage and clarify which vowel is correct in a target word by demonstrating two contrasting sounds with their PMPs. The class can then respond with the correct PMP and oral practice of the appropriate word. Also, as the class reads the sentence aloud independently, the teacher may pause at a word she hears mispronounced and similarly draw attention to the correct pronunciation by demonstrating the appropriate PMP. In this way, the teacher is able to give feedback in the form of a recast, or ‘reformulation of all or part of a student’s utterance, minus the error’ (Lyster & Ranta, 1997, p. 46). This is also effective in one-to-one guided reading instruction with students.
Conclusion

This paper has described an innovative approach to teaching specific aspects of pronunciation and assisting beginner-level, preliterate adult learners of English to develop literacy. These aspects included vowel perception and production, the development of an awareness of English word stress, and the relationship of vowel sounds to their spelling. The connection between English sounds and their spelling has been recognised as an important teaching point in pronunciation pedagogy (Brown, 2018). There is also evidence that adult students developing literacy may benefit from the use of multisensory teaching techniques, which can ‘help [them] connect shapes and sounds more than just visual [teaching methods]’ (Abadzi, 2019, p. 63); a factor which was taken into consideration when experimenting with the Vowel Matrix in the class of beginner-level adult learners of English described in this paper.

The classroom application was, of course, limited to the introduction of monophthongs, and so there is a need for further work in different regions and teaching contexts to test the use and effectiveness of the PMPs in developing sound-spelling awareness of other vowel and consonant combinations. For example, teachers of young learners may also benefit from incorporating aspects of the Vowel Matrix to assist with literacy development (Shin, 2014), and teachers of more advanced learners may find elements of it useful for developing their students’ English orthographic competence (Brown, 2018). Additionally, we note that adjustments to PMPs may be warranted in different areas to make allowance for regional variance of vowel sounds, as this paper has presented PMPs relevant to a single dialect of Australian English. However, our observations thus far suggested that the PMPs were effective in drawing students’ attention to English vowel sounds and English spelling in a constructive, engaging way.

Notes

1. In this article, the term preliterate is used to describe adult learners for whom ‘first-time reading and writing occurs alongside learning a second language’ (Kurvers, 2015, p. 58).

2. A discussion of the importance of vowels, dialects, and accent and their relationships to learner identity is acknowledged, but beyond the scope of this paper.

3. This paper is contextualised to Australian English; however, the Vowel Matrix and its PMPs can be adjusted to other dialects and diphthongs relevant to the context in which they are used.
4. In this paper, we refer to Australian English vowel qualities, as this reflects the teacher’s dialect which was used as a model relevant to the teaching context described.

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**References**


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