**PRODUCT AT A GLANCE**

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<td>Website: <a href="https://bluecanoelearning.com">https://bluecanoelearning.com</a></td>
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<td>Price</td>
<td>A free “basic” version of the app that the user may access indefinitely is available in app stores; users may upgrade to a fully featured Premium version for $49 per year (price as of August 2020). Schools and organizations can purchase licenses for students, an option that also provides content customization and access to an educator’s dashboard. Detailed pricing for this package can be obtained via direct communication with Blue Canoe</td>
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General Description

Blue Canoe is a mobile application developed in 2018 by Blue Canoe Learning, a team of ESL (English as a second language) educators, machine learning scientists, software engineers, and entrepreneurs. The app incorporates the Color Vowel® System and artificial intelligence (AI) technology to help non-native speakers of English improve their pronunciation. More specifically, by introducing English vowel sounds through a system of colors and symbols and providing a training practice routine, the app aims to increase learners’ comprehensibility by enhancing their ability to remember, recognize, and produce the stressed sounds of English words.

Blue Canoe offers users an individualized daily learning plan and a detailed report of their progress. Once registered, a user completes a set of introductory tasks that familiarize them with the app while diagnosing the areas they need to improve. The app then generates a personalized 90-day learning plan, which includes 10 minutes of daily pronunciation practice consisting of lessons, games, and video resources. Today’s Plan is a handy feature that shows users the tasks they need to do in order to complete the learning path.

The Color Vowel System serves as the underlying methodology for the instructional activities. Built around a color-based chart of 14 essential vowel sounds, the app uses iconic images to cue the use of specific sounds, such as “red pepper” as the stressed sound in the word “educate” and “green” for the stressed sound in “teacher.” These images and phrases appear in each app activity and in the feedback users receive when an error has been detected.

The app features two word-level games. Color It Out is a virtual card game in which the user’s goal is to match cards to those played by the computer according to the stressed vowel sounds of the target words. The user receives explicit pronunciation feedback after each spoken turn. Once a user has completed three games of Color It Out, they gain access to Sort It Out, in which the user sorts a series of words by their stressed vowel sound.

Blue Canoe’s Lessons are the app’s main learning activity and consist of a variety of sentences that touch on a number of topics such as Life, Language, Work, Industry, and School. Within each topic, there are four to six smaller subtopics. For example, in the Work theme, the user will find a collection of related lessons such as Business meetings, General workplace, Jobs and interviewing, and Reporting. Each lesson consists of six sentences.

On their product website, Blue Canoe states that the app will help both individual learners, language institutes, and businesses. They offer customized content to schools and organizations. This review will focus on the use of Blue Canoe with curriculum.
Evaluation

Technological Features

The app’s simple structure and pleasant interface make for easy navigation. When opening, users can get right into the learning plan for the day and simply click on the activity to practice. Users can scroll down to see the general topics and slide to see the subtopics before selecting a specific collection of phrases to practice. Other technological features such as videos, graphics, and sounds are also easy to use. The videos are short and attractive. The tutorials explaining the Color Vowel System are easy to follow, and they contain no intimidating linguistic jargon.

With Blue Canoe, the user’s experience with automatic speech recognition is quite pleasant. The voice recognition system is sensitive, rarely having any problem in receiving input. In addition, in the version on both iPhone and Android reviewed, the reviewer never experienced a waiting time of longer than 15 seconds for AI feedback. It takes from 5 to 15 seconds for each recording to be processed before a score and feedback is sent back to users. Figure 1, from left to right, shows three screens representing the three steps including recording, receiving feedback, and reviewing.

The stopwatch icons in the second image of Figure 1 indicate that there were long pauses in the response, while the highlighted parts indicate that the vowels in those words were not pronounced accurately. It is important

Figure 1. Screen shots of Blue Canoe’s three-step process: (a) users record themselves—in this case with color-coded vowel hints; (b) the app gives them feedback; and (c) the user reviews the feedback.
to note that the app prioritizes feedback on vowel quality and stress errors. When the user’s stress and vowel sounds are evaluated as being on target, the app provides explicit feedback on some consonant mistakes, including /r/ versus /l/, /b/ versus /v/. Other errors, such as missing final consonants, are identified more generally, and for these, users can compare their speech to the recording by the native speaker that accompanies each phrase or sentence. To compensate for the limited feedback on consonants, the developers have added a component called Extras, which is a message box that shows what has been recognized by the app. When clicking on the Extras (as shown in the image in the middle), users can view what the AI has “heard” (as shown in the image on the right). With high score results, there is no such extra feedback. In the sentence lesson, users have only three attempts for each sentence. After three tries, they have to move on to the next sentence. Based on the score, mistakes highlighted, recording comparison, and sometimes extra feedback, users can decide to try two more times or go on to the next question.

However, it is important to note that in some cases, the score and AI recognition do not seem to match, which may cause confusion for users. Figure 2 shows another user’s recording with a score of 19%.

In both Figure 1 and Figure 2, according to the feedback, the user mispronounced the target vowels; however, AI was able to figure out what the speakers tried to say except for the “-ed” after the verb. Looking at this feedback, learners may be confused as to why they were rated low while they were “understood” in

Figure 2. Screen shots of Blue Canoe’s three-step process: (a) users record themselves—in this case without the color-coded vowel hints; (b) the app gives them feedback; and (c) the user reviews the feedback.
the transcription. This is where an instructor’s support is needed. It is important that users understand the meaning of each component in the feedback, including the score, the symbols, AI recognition, and their own judgment.

**Pedagogical Features**

In terms of instruction, Blue Canoe provides brief and visually appealing tutorials and videos. Users that are new to the Color Vowel System may find it useful to go through the videos in the Additional Activities section. One supplementary resource that can be a great help for students during and even after the training period is the dictionary. Each word in the dictionary is “colored” according to the stressed vowel. An example of some items in the dictionary can be found in Figure 3.

Additionally, the two games also help to diversify the types of activities in the app. Figure 4 shows a user’s turn when they pick a card and record themselves saying: “purple shirt—term, purple shirt—learn.” As shown in the image on the right, when users do not say the target sound correctly, they will receive instant feedback.

Perhaps the greatest contribution that Blue Canoe can make to a class comes through its automated feedback. The individual report presents total and categorical scores with color vowel proficiency. When words with target sounds are mispronounced, they are pointed out and color-highlighted, which can guide the learners to adjust their voice and make a new recording. This process

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**Figure 3.** Blue Canoe categorizes different vowel sounds according to 14 different codes; here, the rose color is for the vowel sound in “corn” and “cone.”
can take the students away from simply listening and repeating. Since users are provided with different types of feedback, it is important that instructors help learners to understand the benefit of each type of feedback and make suggestions to learners on how to best utilize the app. For example, they can choose whether to turn on or turn off the hint that shows the color of the vowels; to listen to the recording before making their own recording or not; to reattempt or just move on after receiving feedback. Teachers can encourage the students to use the hint during the beginning weeks of the training session, and then after a while they can try to say the phrases without hints. Teachers can also suggest to students to keep a record of words which virtual listeners do not recognize.

A number of businesses have selected Blue Canoe for their employees and the app was also built to target this group of learners; therefore, it can be a good supplementary resource for ESP (English for specific purposes) classrooms. The app has a sizable collection of vocabulary and phrases in several fields, including business, customer service, finance, medical, travel, academic discussions, etc. Although Blue Canoe has a variety of sentences and phrases, they are just individual utterances that are not linked in to a conversation. A simple variation that teachers can try is to let students come up with a response to the given sentences in the app. Teachers and learners may welcome more interactive and communicative activities in the future versions.

Figure 4. In Blue Canoe's *Color It Out* game, users record themselves speaking the matching pair (left) and then receive feedback (right).
Teacher and Materials Developer Fit (Approach)

Central to the app is the Color Vowel System (Taylor & Thompson, 1999). Using a color-coding scheme to introduce the vowel sounds has been an instructional way developed and adapted by several ESL instructors and researchers (Celce-Murcia et al., 1996; Finger, 1985; Gattegno, 1963; Horrigan, 2006; Nicolaidis & Mattheoudakis, 2012). Finger (1985) presented a vowel color chart that includes 14 color circles representing Canadian vowels and diphthongs designed for immigrants and international students in Toronto. Celce-Murcia and co-workers (1996) gave a description of 15 colors relevant to 15 vowel sounds of English (p. 112), as well as detailed descriptions of some activities using the coding scheme. The unique characteristic of the Color Vowel System (Taylor & Thompson, 1999) is that it combines the traditional linguistic vowel chart with colors, key words, and concrete nouns (green+tea, silver+pin, gray+day, etc.), so as to provide learners with a mnemonic visual cue for vowel sounds, thereby eliminating the need for phonetic symbols that might distract, confuse, or even intimidate learners. In addition, the Color Vowel Chart is brought to life through a patented, brain-based strategy called the Open Hand, in which the learner extends their arm on the stressed syllable of the word, in order to create the necessary time on vowel. The app delivers consistent messaging around the importance of this use of gesture; for example, when the learner fails to use enough stress, the app feedback says, “You’re not using enough stress. Use your open hand to spend more time on the underlined sound.” The chart in Blue Canoe features 14 “essential” sounds, a subset of the 16-vowel Color Vowel Chart (fifth edition). Blue Canoe excludes the sounds “auburn dog” and “orange door,” which are considered less critical vowels in a learner’s English. This explains why in the dictionary incorporated into the app, the two words “corn” and “cone” (in Figure 3) are categorized as “rose” color, which speakers of different English dialects may not agree with. However, developers of the app explained that the machine learning component of the app was trained on a range of North American native speaker accents and, therefore, tolerates variation. For example, the word “aunt” can be spoken with the “black cat” vowel or the “olive sock” vowel and be evaluated as correct. Therefore, it is important for teachers to understand the Color Vowel Chart, and to help students be aware of other phonemes that can be found in other varieties of English.

Another benefit of the app is its ability to give immediate personal feedback. Second language pronunciation researchers have suggested that learning technology should give learners opportunities to have “highly individualized practice based on needs established through appropriate assessment” (Derwing & Munro, 2015). Blue Canoe is definitely an innovative attempt in this direction.
In addition, one great feature that has been added into Blue Canoe is the weekly support for registered teacher users. Most of these mini professional workshops are led by Karen Taylor, the head of education at Blue Canoe and co-author of the Color Vowel System. Here, she gives tips for a Color Vowel classroom using Blue Canoe and leaves time for general questions. Occasionally, teacher users can join a live panel in which speakers are English instructors who have integrated Blue Canoe into their classrooms. Such professional development workshops not only provide valuable resources for teachers, but also create a worldwide community connecting teachers with the same concerns and interests.

**Learner Fit (Design)**

The app can meet individual needs by providing a personalized learning plan based on a user’s performance. However, users cannot customize the amount of learning time in the daily learning plan. The learning plan is only available on a daily basis and is restricted to 10 minutes a day. After finishing Today’s Plan, learners cannot move on to the plan for the next day. Instead, they browse through the lessons or the games to work on anything they like. Thus, in order to complete the personalized learning plan, a user needs to patiently go through at least 90 days of training. It also takes users’ patience to utilize the app, because some may get distracted or frustrated during the waiting time for the feedback. With some users, looking at the screen and waiting for a response (even if it is just a five-second wait) is a negative experience. In the version 2.1 that is being reviewed, the practice time cannot be customized in order to shorten the time to complete the learning plan, and the practiced sentences cannot be skipped. Additionally, users cannot keep track of the training components of the previous day, and they need to remember the name of an activity in order to browse through the components to find it.

In terms of personal customization, the app provides a good system of notification and language settings. Users can set reminders for a specific time during the day to help them keep their streaks. In addition, besides English, other languages including Chinese and Japanese are available as the app language. This option can be an advantage for Chinese and Japanese users, because it allows users at a very beginning level to navigate the app easily.

**Summary**

Blue Canoe can be a simple and effective learning tool for pronunciation if the instructors and learners have a clear and focused purpose that aligns with what the app offers. Blue Canoe prioritizes phrase stress, lexical stress, and vowel
sounds, which is its strength and also its limitation. In terms of segmentals, it places emphasis on vowels and a small number of consonants. In terms of suprasegmentals, it provides extensive and explicit practice around lexical and phrase stress. Therefore, those students who struggle with stress and/or vowel sounds can benefit greatly from this app. As for classroom incorporation, in addition to offering an app that teachers can use with each student to measure individual improvement, Blue Canoe also provides extensive free support for teachers in pronunciation teaching and in utilizing the app in classrooms. The teacher community is an organic part of the app.

References


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Reviewer Information

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