

## ГУМАНИТАРНЫЕ НАУКИ



UDC 81

### Development of Phonetic Simulator as the Prevention of Muscle Dysfunction and Improvement of Pronunciation of Sounds in the Russian and English Languages

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**Abstract.** The article discusses the problem of muscle dysfunction of people of any age category, which affects the incorrect pronunciation (articulation) of sounds both in Russian and in any foreign language (in this work English is considered). The development of a special phonetic simulator, which can be used as a mobile application, will help to solve this problem, based on the introduction of artificial intelligence and a set of basic verbal and sound combinations.

**Keywords:** muscle dysfunction, pronunciation, articulation, phonetic simulator, mobile application, artificial intelligence, sound combinations, foreign language.

### Разработка фонетического тренажера для улучшения произношения в русском и английском языках, а также для профилактики артикуляционной дисфункции

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**Аннотация.** В данной статье рассматривается проблема артикуляционной (мышечной) дисфункции людей любой возрастной категории, которая влияет на неправильное произношение (артикуляцию) звуков, как в русском, так и в любом иностранном языке (в данной работе рассматривается английский). Решить эту проблему поможет разработка специального фонетического тренажера, который можно использовать в качестве мобильного приложения, основанного на внедрении искусственного интеллекта и набора основных словесных и звуковых комбинаций.

**Ключевые слова:** мышечная дисфункция, произношение, артикуляция, фонетический симулятор, мобильное приложение, искусственный интеллект, звукосочетания, иностранный язык.

**Introduction.** The problem of incorrect articulation of sounds is quite common for both adults and children. Modern medicine quickly and effectively helps to eliminate this disadvantage, and experienced speech therapists choose the right set of exercises that will help to adjust the articulation of sounds and relieve, for example, hissing, burr and swallowing sounds. There are people who do not pay attention to their speech shortcomings and do not think about their improvement. There are a number of reasons for it, such as: lack of time to visit a speech therapist, unwillingness to spend extra money on consultations with a specialist and the process of improving speech itself will take some time, at least six months. If a person does not experience any problems having certain articulatory disorders, then there is no need to eliminate these violations, but it must be remembered that a violation of articulation in the native language leads to incorrect articulation when learning a foreign language. That is why very often people encounter phonetic difficulties of a foreign language, for example English. Without knowing how to "use" properly the organs of speech (the position of the tongue, lips), it will be extremely difficult to master articulatory nuances. Therefore, the development of a phonetic simulator to eliminate or at least facilitate articulatory dysfunction is a useful and necessary innovation.

**Main Part.** This simulator consists of three main parts, which are important to learn sequentially. The first part studies the most common speech dysfunctions and different ways how they could be solved. The second part refers to the Russian sound system, main peculiarities of its phonemic system and the third part studies the sound system of the English language and comparative analyses between two sound systems. This comparative analysis helps to understand all the differences between English and Russian sounds what gives a learner a very clear idea how they should be pronounced to sound more or less like a native speaker. Visualization in the use of this simulator takes the main role. Articulation of every sound has a video and audio file and a learner has an opportunity to watch and listen to it as many times as needed until he pronounces a sound correctly and the system approves it. By means of AL more than

1000 English words are recorded by native speakers what helps the system to make corrections every time when a user mispronounces sounds, words or word combinations.

To make the process more efficient, the simulator divides all sounds according to their principles of similarity, for example, alveolar sounds, labio-dental, bilabial, plosives, affricates etc. After every sound combination a user gets a task with a text reading. In case of making mistakes, AL will show them on the screen and a learner will be able to reread the mistaken part.

Let us consider the content of the simulator's first part devoting to prevention of speech dysfunction. There are a set of exercises to improve diction that include strengthening the muscles of the speech apparatus, working on the pronunciation of vowels and consonants, developing the speed of reproduction of individual words and phrases.

A large number of effective exercises have been developed for adult men and women to improve diction. All classes in this category are aimed at the comprehensive development of the speech apparatus, increasing the level of internal self-esteem, the quality of diction and self-confidence during a conversation with other people.

#### Exercise 1. Articulation charging

This exercise is aimed at the development of articulation, strengthening of the muscle tissues of the speech apparatus, clear pronunciation of the most complex words and phrases. Articulation exercises are recommended to be done 1-2 times a day [1].

The order of charging for the development of articulation

Step 1. Strengthening the muscles of the tongue root.

Step 2. Fast movement of the tongue inside the oral cavity.

Step 3. Rotating movements with the tongue.

Step 4. Training the facial muscles of the lower part of the face.

Step 5. Rotation of the tongue with the mouth open.

Step 6. Stretching the cheeks.

Step 7. Comprehensive strengthening of all facial muscles.

Articulation exercises are recommended to be carried out before starting all other exercises aimed at developing diction, voice production and training of the speech apparatus.

#### Exercise 2. Pronunciation of explosive sounds

During the performance of this exercise, a better sound of consonants and vowels is practiced, due to which the distinctive and semantic function of individual words is provided. We pronounce the following sounds [2]:

Pp, bb, tt, dd, gg, kk, kp, pk, bg, gb, dt, td, tg.

The reproduction of the above sounds should be carried out quickly, but at the same time with the preservation of the clarity of the sound of each letter. This exercise allows to improve the quality of diction in a short period of time. All letters should be pronounced on the explosion and sound sonorous. This lesson is held daily with a duration of 10 to 15 minutes.

#### Exercise 3. Proper breathing

The statement of breathing is an important stage in the overall process of developing diction and improving the sound of the voice. The implementation of this exercise, aimed at improving the functions of the speech apparatus, provides for the following actions: open the mouth, and then perform 10 breaths and exhalations through the nose. Put your right hand on your stomach in the solar plexus area. After that, take a deep breath through the nasal passages and inhale air through a small hole formed by the lips. Repeat this action 6 times. Close the left nostril with your finger, and then perform 5 short breaths with the right nasal canal. After that, open the left nostril and exhale air. Then similar actions are performed with respect to the other nasal canal. For 5 minutes, breathe exclusively through the nose, but at the same time create pressure with your fingers on the surface of the maxillary sinuses. Take a deep breath through the nose, tighten the abdominal muscles inside the abdominal cavity, and then make a sharp exhalation through the nasal channels [3].

#### Exercise 4. Pronunciation of tongue twisters

Diction (exercises to improve diction should be performed regularly) is developed only if you constantly work on the clarity of your speech. Pronunciation of tongue twisters is classic and one of the most effective ways of setting a good intonation, ringing voice and articulate pronunciation of every word. This exercise can be performed an unlimited number of times throughout the day [4].

During the pronunciation of tongue twisters, it is recommended to follow the following rules:

1. every word and syllable must be pronounced slowly;
2. as the diction improves, the pronunciation of the tongue twister should be accelerated;
3. it is better to break long tongue twisters into 2-3 parts;

Betty Botter bought some butter  
But, said she, the butter's bitter.  
If I put it in my batter,  
it will make my batter bitter.  
But a bit of better butter  
will make my bitter batter better.  
So she bought some better butter,  
better than the bitter butter,  
put it in her bitter batter,  
made her bitter batter better.  
So it was better  
Betty Botter bought some better butter.

Using this method, it is possible to assess the progress in the development of articulation, clarity of words and reproduction of sounds.

Exercise 5. Training of the muscles of the pharynx and soft palate.

The following exercises are recommended [5]:

1. Yawning with your mouth open;
2. Arbitrary coughing, coughing with your tongue out;
3. Simulate gargling with your head thrown back;
4. Gargle with a thick edible liquid: jelly, yogurt, juice with pulp;
5. Swallow water in small sips;
6. Inflate cheeks with a pinched nose;
7. Imitate moo, moan, whistle.

All mentioned above exercises first times should be performed under speech therapist control who may correct inaccuracies if needed. The speech therapist monitors the following criteria [6]:

1. accuracy;
2. smoothness;
3. pace;
4. sustainability;
5. the transition from one movement to another.

Criteria for the quality of exercises performed [7]:

1. precision of movements;
2. the ability to hold a pose;
3. duration of holding the articulation pose;
4. execution rate;
5. smoothness of the exercises;
6. symmetry of exercise performance;
7. scope of movements.

**Conclusion.** The given number of exercises may help people with speech dysfunction to improve their articulation what will help not only to make the articulation of Russian sounds better but also to learn foreign languages and their most difficult part as Phonetics. To avoid mistakes in a foreign language is very difficult making them in your own one, that is why this phonetic simulator is a very suitable option for those who face the problem of incorrect pronunciation.

#### Библиографический список

1. Айзман Р.И. *Медико-биологические основы дефектологии*. Москва: Юрайт; 2020. 225 с.
2. Аксенова Л.И. *Абилитационная педагогика: учеб. пособие для академического бакалавриата*. Москва: Юрайт; 2018. 377 с.
3. Галасюк И.Н., Шинина Т.В. *Основы коррекционной педагогики и коррекционной психологии. Кураторство семьи особенного ребенка: учеб. пособие для СПО*. Москва: Юрайт; 2019. 179 с.
4. Айзман Р.И., Иашвили М.В., Лебедев А. В. [др.] *Медико-биологические основы дефектологии: учеб. пособие для академического бакалавриата*. Айзман Р.И. (отв. ред.). 2-е изд., испр. и доп. Москва: Юрайт; 2018. 224 с.
5. Рипа М.Д., Кулькова И.В. *Лечебно-оздоровительные технологии в адаптивном физическом воспитании: учеб. пособие для академического бакалавриата*. 2-е изд., испр. и доп. Москва: Юрайт; 2019. 158 с.

6. Шашкина Г.Р. *Основы коррекционной педагогики и коррекционной психологии: логопедическая ритмика*: учеб. пособие для СПО. 2-е изд., испр. и доп. Москва: Юрайт; 2019. 215 с.

7. Шевцова Е.Е., Забродина Л.В. *Технологии формирования интонационной стороны речи*: учеб. пособие для бакалавриата и магистратуры, 2-е изд., перераб. и доп. Москва: Издательство Юрайт; 2017. 189 с.

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