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Intelligent system in sensory and cognitive development for the pre-reading stage

Sistema inteligente en el desarrollo sensorial y cognitivo para la etapa prelectura

FOKIN, Sergei Konstantinovich†*, ARICEAGA-PAREDES, Rafael and PÉREZ-PÉREZ, Tomás

Escuela Normal No. 3 de Toluca
Universidad Autónoma del Estado de México, México
Centro Clínico de Oído, Nariz y Garganta
Instituto Tecnológico de Toluca

ID 1st Author: *Sergei, Konstantinovich-Fokin* / **ORC ID:** 0000-0001-8975-9678

ID 1st Co-author: *Rafael, Ariceaga-Paredes* / **ORC ID:** 0000-0003-1079-5380

ID 2nd Co-author: *Tomás, Pérez-Pérez* / **ORC ID:** 0000-0002-8156-2325

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Abstract

The article is dedicated to the problem of acquiring knowledge and skills for the pre-reading stage in basic education. It examines the reciprocal relationship between the development of the cognitive and sensory system of the subjects in school classroom and knowledge formation. It is shown that the notion "tonal ear" is an ability to differentiate by ear the sound complexity in the ratios of sounds by height. At the same time, "the balance" of the ear is determined as a need for the development of the listening of the educator and the student. It will be granted that the game, as one of the valuable pedagogical strategies, must be the distinctive part of the intelligent system, represented by software's TOTEM 1.1, 1.2 and NOMOS 1.0. Objectives are to develop the tonal ear and its balance for the pre-reading stage in phonetic-phonological training through the realization, creation, and implementation of programs; to strengthen auditory knowledge of tone for the balance of the hearing system in school classroom subjects. Methodology: theoretical-experimental. Considerations: it is mentioned that the pre-reading stage is important in the development of phonetic-phonological knowledge and skills and inevitable in the communication between school classroom subjects.

Game, Software´s, Tonal Ear

Resumen

El articulo está dedicado al problema de la adquisición de los conocimientos y habilidades para la etapa prelectura en educación básica. Se examina la relación reciproca entre el desarrollo del sistema cognitivo y sensorial de los sujetos en aula escolar y formación de los conocimientos. Se muestra que la noción "oído tonal" es una capacidad para diferenciar mediante oído la complejidad sonora en las relaciones de los sonidos por altura. Al mismo tiempo, "el equilibrio" del oído se determina como una necesidad del desarrollo de la escucha de la educadora y el estudiante. Se concederá que el juego, como una de las estrategias pedagógicas valiosas, tiene que ser la parte distintiva del sistema inteligente, representada mediante softwares TOTEM 1.1, 1.2 y NOMOS 1.0. Objetivos son: desarrollar el oído tonal y su equilibrio para la etapa prelectura en la formación fonética-fonológica a través de la realización, creación e implementación de programas; fortalecer el conocimiento auditivo del tono para el equilibrio del sistema de audición en los sujetos de aula escolar. Metodología: teórico-experimental. Consideraciones: se menciona que la etapa prelectura es importante en el desarrollo de conocimientos y habilidades fonético-fonológicos e inevitable en la comunicación entre los sujetos de aula escolar.

Juego, Softwares, Oído Tonal

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* Correspondence of the Author (Email: fokin.sergei.19@normal3toluca.edu.mx)
† Researcher contributing as first author.

Ludendo discimus
Leibniz, Gottfried Wilhelm (1646-1716)

Introduction

Boy hears but doesn't understand

At the same time something happens with one of our senses, with hearing: we hear everything, when we want and do not want to, when we can give an account and when we cannot, when we can pay attention and when we cannot: breaking the wind, piousness of a mosquito, noise of the mechanical workshop, hoarseness of the grandfather, cry of the teacher ... Poor ear! The teacher said something, but her squeaky voice was as low as that of a lady in her third age, which the student, although characterized as very considerate, could not hear. But he still heard and didn't understand what the teacher was about. It is a problem of the formation of the knowledge and teaching of the teacher, the expected and significant learning of the student in basic education. Listen or hear? Hear or listen? The "listening" process, unlike the "hearing" process, is a cognitive process, which develops for the most part in education. Cognitive development is the development of mental processes: perception, memory, imagination, formation of notions and logic.

As we know, the principle of educational processes is in the communication between the subjects of the classroom: the educator and the student. Among them is constantly developing the change of information, basis by which knowledge is constituted. The communication process follows not only in one direction, that is, from the educator to the student, but vice versa (Figure 1). Verbal relationships between classroom participants are direct and retroactive (Saussure, 1968–1974).

Figure 1 Communication
Source: Saussure F. Course in general linguistics

On this basis it is necessary to consider that the information with which the subjects of communication are exchanging with each other is not yet knowledge. For some knowledge to be true, the student must perceive the information that is a knowledge of the educator, then feel it, reason it, and return it to her. The educator perceives the student's information, reasons, verifies, and verifies the knowledge. We are faced with processes that come from the consciousness and mind of the educator and the student. Since then, perception, sensation, feeling, and reason are the constitutional powers of human consciousness and the state on which depends on the development of the skills and abilities of the latter.

Problem

Everyone hears, but not everyone listens! Verbal communication, which has a direction vice versa in school classroom between teacher and student, can be positive only in this, when and nothing else, only in this there is a tuning in the speech and listening of the subjects in the classroom. The principle of auditory attunement is a simultaneous differentiation of speech tones in the listening process. Guessing a tone, you hear is a skill of great importance in the communication process between teacher and student in Basic Education, since tone is the basis of the word. The word, which depends on the tone, can have any meaning, different understanding and be pleasant or offensive. The question: Do educational actors can differentiate tones?

The labyrinths of science

The medium of sound and hearing is so complex that, from very distant times to the present day, intellectuals seek answers in the fields of philosophy, science, medicine, and psychology. Sound is investigated by acoustics, which has thousands of years of discoveries. Hearing is explored by psychoacoustics, the basis of which are acoustics and psychology. In other words, psychoacoustics, which is a part of psychophysics, is dedicated to studying the quantitative dependence between the sound stimulus and the sensation it evokes.

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Speaking, it shows the interest in the perception of pure tone through the two different procedures of the nervous system of the human being. It is undoubtedly that hearing is presented by two processes: one is hearing and the other is listening. It is important to clarify that to describe the cognitive process "listening" it is not enough to apply the knowledge and theories of acoustics, psychoacoustics, psychophysics, neurolinguistics, and music. Obviously, the explanation of listening, in the common, also determines as a cognitive process in its definition as a process of attention. Process of hearing (to hear) is well investigated and analyzed. It is based on the following scientific theories, from: microphone, electromechanical, string theory by Hermann von Helmholtz and current wave theory by Georg von Bekesy.

The process of listening (to listen) is little studied, some approaches prevail for the definition and revelation of specific characteristics, such as: modes of hearing by Pierre Schaeffer, who established a four of hearing modalities depending on the relationships between sound perception and sound attention: hearing, listening, understanding and comprehending (Schaeffer, 1966); by Ernst Schachtel, who described the hearing process according to where the hearing itself was focused: on the subject or on the object, the *auto centric mode of hearing* is a mode of subjective hearing based on the feeling of satisfaction or dissatisfaction of the subject before the sound stimulus (Schachtel); by Denis Smalley, who clarified the modes of indicative hearing, reflective and interactive, which describe the process of sound perception centered on the object and consider sound as a message and as a sign to be decoded (Smalley). The basis of the theories mentioned is in psychoacoustics, particularly, in the perception of a sound thing through the sense of hearing.

To the common state of hearing as a natural phenomenon are dedicated the searches of Casey O'Callaghan (O'Callaghan, Object Perception: Vision and Audition, 2008), (O'Callaghan, Sounds: A Philosophical Theory, 2007), and Matthew Nudds (Nudds, 2001). Different theoretical research on hearing defines the process of "listening" as "paying attention", but this can be incorrect and confusing. No theory of hearing that did not manage to oppose this phenomenon could be considered as a theory of listening.

Let's admit for the moment that listening, mentioned above, is a cognitive process and we turn our attention to this issue, considering that without hearing there is no listening. But to say something needs to be followed successively.

A tone is presented with a sound and is defined as "that attribute of auditory sensation in terms of which sound may be ordered on a scale extending from low to high" (ANSI, 1994). It is known of all, that sounds are classified: speech, musical, nature and noise. The sounds of speech and music, unlike the sounds of nature and noise, are organized into exact systems and with inherent nothing more than them, isolated, constant, and generating, being the artificial product of human creation. Sounds should be highlighted and distinguished by the individual's ear.

The difference between speech sounds and musical sounds as two distinct artifacts that are transmitted through the ear organ to the central fields of the brain, is in the following specifications: for speech sounds, the main constants are the specific timbres; in other words, the spectral characteristics of the voice, its basic frequency does not transmit the function of differential meaning and in the perception of speech we do not perceive this frequency; musical sounds have other characteristics of their constants and their emergence, their generating source is the height of the sound, and their constants are presented in the relationships of the sounds at their height.

In accordance with the above, the definition of sounds through their recognition by the ear is: the ear of speech, which is the ringing ear; the musical ear, which is the tonal ear. The tonal ear, similarly, with psychologists (Leóntiev, 1981), is an ability to differentiate by ear the sound complexity in the relationships of sounds by height, in classifications: high, medium, and low.

The ability to discriminate the tone is relevant in the process of communication in the school classroom based on understanding during teacher-student interpretation, for the formation of the necessary knowledge in teaching and learning.

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Taking as a reference the analysis of the results obtained in the experiments of the application of the tonal ear test, created with its own method in the development of the research, speech sounds and musical sounds have as a common basis through the ability of the human being, to be discriminated by his ear in the precise height of the sounds (speech recognition, the musical scales, the sung word, the vocal lyrics in the prolonged pronunciation: the ancient religious songs and the arias of the operas of the "bel canto" style. We call this ability the ability of the tonal ear.

The tonal ear known since distant times as "the absolute ear", generally in people dedicated professionally to music, is the ability of the human brain to discriminate the tone. With this ability the sounds are distinguished or differentiated in their height and in their relationship by the precise height. Thinking about the situation of Basic Education, the state of teaching and learning of teachers and the human formation of students, the requirement of the development of the auditory system through the balance of the tonal ear was specified. Thus, consequently, an idea and a model were engendered to develop and implement the guessing game: Guess what tone you listen!

Theoretical reference

Provided that we consider that the absolute ear as the tonal ear is a basis of the listening process and the ability to differentiate the tones by the explicit height, it is necessary to specify the characteristics of the listening.

Listening, and this is the common thing between hearing or listening, is characterized by the movement of sound perception, being like the auditory sensation in its first appearance in the consciousness of the human being. Then, particularly, it is recognized as a sound object, imagining it, and then begins to know giving the notion to the sound, thinking, if it is sound of the precise height that he hears, knows, and distinguishes. That is, the listener with his absolute hearing capacity can find the same sound, which he perceived, in thousands of others.

Similarly, we support Kant who describes in the "Criticisms", where a distinction is made between mind and knowledge that thinking and knowing self-object is not a similar thing (Kant, 2001-2006), considering that to know a sound there must be the notion and contemplation. To determine the process of listening you must persevere in the intervention with a method: stimulus – response, and not as in psychology: stimulus – reaction. The difference is in the discernment between action of the mind and action of the immediate opposing movement. We must continue along the path to discover the intellectual development of the agents of education, where it is important to develop the tonal ear as the basis of understanding and comprehending between the teacher and the student.

Methodological reference

In line with the essential interest of the subjects of the school classroom to learn, it is important to agree on the importance of play as one of the valuable pedagogical strategies. Since ancient times the thinkers of the world admired the game as a harmonious union between man and cosmos and discovered in the game the mechanisms of the development of the mind and ability to know the Universe.

According to Huizinga, the game is a function of the living being and is not reduced to the culture of humanity, but the culture itself has the nature of the game (Huitzinga, 2000). The game extends towards mind and cognition, logic, and sense (Heidegger, 2006), increases development (Vygotsky L., 1933) and intellectual formation (Fokin S., Aprendiendo a leer, 2008).

To be more specific, the following is transferred, that the game: a reality and a treasure of the intellectual world of the player is presented; the need of man in his native perception and realization is satisfied; it lights up the way to discover the truth and its implication; it marks the difference and equality in the search for the measure of the balance of the possibilities of the human being. Learn by playing!

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Playing the child learns

In situ, with respect to the theories of speech perception and speech sounds, the priority is motor theory: identification of speech elements and their sounds by listening is based on the motor characteristics of pronunciation and acoustics. Therefore, listening (e.g., right ear) in the perception of the acoustic signal of tone "*a" define* the auditory description "*x", looks* for the driving commands "*y1", "y2"..."yj" with* the discriminated signal "*f1", "f2"..."fj"* and the variation of the reason based on the intention "*I1", "I2"*...." Ij"; this phenomenon forms an image of the tone "*c" in* the consciousness and mind of listening.

Speech: $c \rightarrow \{I1, I2, \dots I\,j\} \rightarrow \{y1, y2, \dots yj\} \rightarrow \{f1, f2, \dots fj\} \rightarrow \{x1, x2, \dots x\,j\} \rightarrow a$
Listening: $a' \rightarrow \{x'1, x'2, \dots x'\,j\} \rightarrow \{f'1, f'2, \dots f'j\} \rightarrow \{y'1, y'2, \dots y'j\} \rightarrow \{I'1, I'2, \dots I'j\} \rightarrow c'$, $a = a'$ $(c = c')$

Returning to the topic at hand, methods of the tests were created, which were applied to a population of students of the degrees in preschool and Artistic Education, baccalaureate, and preschool education, as well as to teachers of Normal Education, to create an expert system in the assessment of the state of the auditory system. Two expert systems "TOTEM 1.1" (Fokin S., TOTEM 1.1 Registration Number 03-2017-110611425000-01, 2017) and "TOTEM 1.2" (Fokin S., TOTEM 1.2 Registration Number 03-2017-110611410400-01, 2017) were created to examine the auditory system of children, youth, and adults. The results of application of the tests described the situations with the negative magnitudes: $a \neq a'$ $(c \neq c')$; $a \geq a'$ $(c \geq c')$; $a \leq a'$ $(c \leq c')$. Henceforth, in experiments with the application of the test, the situation $a = a'$ $(c = c')$ was a unique case, i.e., the subject had absolute hearing.

3.1 TOTEM

It should also be said that a unique case allowed us to begin to develop not only a cognitive model, but a physical model and implement software such as expert systems to know the behavior of the balance of the tonal ear in the process of listening. I was aware of the following circumstances and conditions:

- The objects of this procedure are the object of the notion and sensitive object.
- The cognitive model is also physical model, based on physical magnitudes.
- The basis of the model should be the particularities of absolute hearing, which are perception, auditory exposure, memory retention and recognition of pitch patterns.
- The auditory sensation depends on the height of the tone, time, and mental capacity in discrimination of this.
- The act of cognition is performed in the mind

Let's explore a little the idea that the nature of the mind is physical nature, so it is possible to establish relationships between two natures using the "stimulus-response" system (Figure 2).

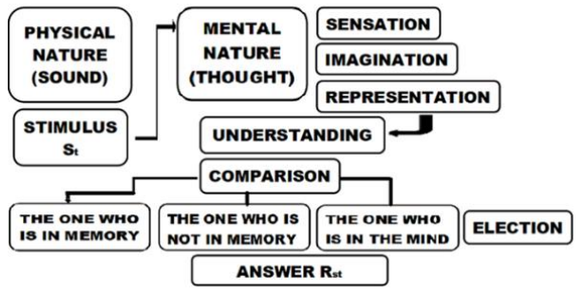

Figure 2 Stimulus (St) – Answer (Rst)

The stimulus between the peripheral auditory system and then the central auditory system, proceeds in the mind appearing as a sensation, then as imagination and then as a representation, then a cognitive work of comparison and choice is made, which represents a game like the games that accompany human beings all their lives, then the answer is given. Psychologically the answer can feel like a triumph of man's voluntary choice. There is the satisfaction and interest of playing.

TOTEM

Playing like a child

To better understand what I wrote above, it is necessary to deploy and concretize the guessing game, and it is not a simple game, but an intellectual game: listen, perceive, think, differentiate, and respond.

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TOTEM 1.1 software is an expert system that acquires information, analyzes, and presents results. It is divided into different screens: register, choice of sound timbre (pure or piano), stimuli for each ear separately, search field and choice of tone of the stimulus heard, a differential calculation system and two representations of results, on the one hand, is of each of the two ears separately and, on the other, is a total, the results will be checked in different mathematical applications.

The core of the stimulus system (15 st´s) is the modal attraction of tones in a tonality. In contrast to studies of psychoacoustics (Weber-Fechner empirical law, Stevens scales), the use of a characteristic of sound: intensity, manifested as unnecessarily. This situation made it possible to specify the alteration of the auditory balance that appears at the same time as negative and positive. That is, that listening, which is the perception of tone, and response, which is the movement of thought, in the left ear is altered positively, while in the right ear negatively. Graphs (10, plus a standard pattern that is time) of alterations were formed. The content of the riddle is constituted by the finding of the isolated tone as a perceived stimulus in the corresponding field of sound without the intervallic relation.

Functions of TOTEM 1.1

- Teacher perceives, then listens to the tone, guesses, looking for the same tone among others and finding the tone, confirms it (Figure 3).

- Expert system acquires the results of "Riddle", analyzes, and gives the numerical answer of the Tonal Ear Balance of the Auditory System of the teacher, presenting the positive o negative alterations in the cognitive process: mind-knowledge.

- Constant of tonal discrimination by both ear is equal to 0. 4999... Probability = 0.001851851...

Figure 3 The teacher plays like a girl. Application of the test TOTEM 1.1

TOTEM 1.2

Playing as an adult

The structure, content, and functions of the TOTEM 1.1 and TOTEM 1.2 software are similar. The only difference is the magnitudes of the stimuli. This was determined for only one reason: the difference in the field of auditory perception of the child and adult. Relationship between two software's is regulated with some constants.

The child plays with totem 1.2 software (Figure 4).

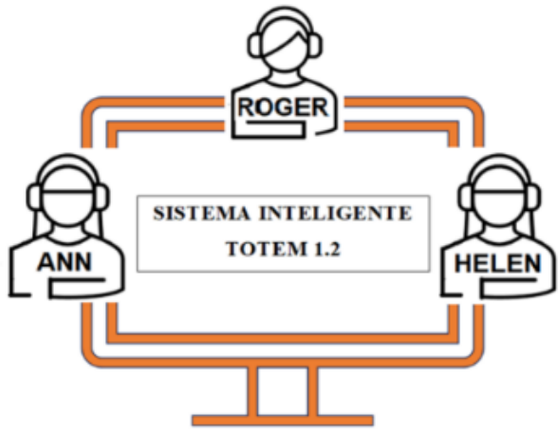

Figure 4 The child plays like an adult. Application of the test TOTEM 1.2

I would have made it a huge mistake that the listener does not hear the same as the speaker, i.e., that the auditory mechanism of the listener (the mechanism of auditory perception) is not prepared for the speech perception of the speaker, who transmits the auditory information prepared by the auditory mechanism of himself. And since the communication process is vice versa, the speaker who is a listener does not perceive something that is spoken by the listener who is the speaker.

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Imagine, a student hears, but doesn't listen to the teacher and doesn't understand, and the teacher hears, but doesn't hear it and doesn't understand either! But the reality is already sincere: playing I learn. Do I learn what he tells me? Therefore that, it is necessary to increase the capacity of the tonal ear and develop my auditory system using a set of exercises of a cognitive software.

The child thinks by learning

Oh, no! To think that I, as a child, have difficulty listening to the teacher, because I don't understand, what she is saying. I pay attention and again and again I don't understand. As a result, a displeasure arises; I think, that's an effect that caused my ear and ... of the teacher. Deafer as walls!

NOMOS

According to the results of the application of the TOTEM tests, it is stated that there is an imbalance of the tonal ear in the subjects of the school classroom. The communication process runs with difficulties.

That is why they created the blocks of integral exercises and software NOMOS 1.0 (Fokin S., NOMOS 1.0 Registration Number 03-2017-110611390300-01, 2017) for the development of the tonal ear as a basis for increasing the hearing capacity of the teacher and the student in basic education. The exercises were organized into 72 blocks with four exercises in each for left (36) and right (36) ear, time of each exercise is 0'14". The basis of the creation of integral exercises based on musical methodology were the following sources: the theories of acoustic structures of ancient Greeks, Byzantines, Italians, and Germans, employing a hypothetical structure of the attraction of sounds in different modes of the tempered musical system.

Greek scientists knew that in a string you can get several sounds not only with the entire length, but also with their parts: 1/2, 2/3 and 3/4. The sounds they obtained by oscillating the parts of the string formed the intervals with their fundamental tone: octave - 1/2, fifth - 2/3, fourth - 3/4. That formation was called the "Pythagorean Formation."

The formation of Pythagoras was done with the mathematical method. When 2/3 of the whole string gives the sound of a fifth above its fundamental tone and 3/4 of the whole string gives the sound of an ascending fourth of the same tone, for 2/3 of any part of the string must give the sound of a fifth above this part and 3/4 of any part of the string give the sound of a fourth above this part. However, if the fundamental tone is "C" and when you take 2/3 of 2/3 of the string (4/9), then you get the sound corresponding to the tone "D1". This sound is out of bounds of the octave C – C1. You take instead of D1 the tone D, which is at a distance of octave down, and you get the tone of 8/9 of the string.

Then, the tones are formed as follows:

- 2/3 of 8/9 (16/27) is tone A.
- 2/3 of 16/29 (32/81) is the tone E1, this tone is out of bounds of an octave C – C1, the tone E is going to have the magnitude of 64/81.
- 2/3 of 64/84 (128/243) is the H tone.

In this way the major diatonic scale of Pythagoras is formed (Table 1):

C	D	E	F	G	A	H	C1
1	8/9	64/81	3/4	2/3	16/27	128/243	½

Table 1. Pythagoras. The larger diatonic scale

The Pythagorean formation is an infinite formation, that is why in the sixteenth (Zarlino) and eighteenth (Werckmeister) centuries the sound magnitudes of the tempered musical system were corrected and established, which until the present day are in the utility. "International Organization for Standardization (IOS)" adopted for the tempered music system the frequency (Pitch) of note A5 which will be 440 Hz.

According to Fokine S., to distinguish the fingerboard of different musical instruments and voice, which is used in Mexico, the tempered organization, for example, of the piano contains seven complete octaves and two incomplete ones, from the beginning of keyboard to the end and is divided into indices (Fokine, 2004).

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Then, A5 belongs to the octave of index 5. In the research and application of the tests, tones of the tempered musical system of the octaves were used in different indices. In the tests "TOTEM1.1 and "TOTEM1.2", which were presented as "stimulus" the pure tones of the octave of index 5, related to grades I, IV and V in Ionic mode (Ursprung, 1940), and as "the answer" was a set of tones distributed randomly.

The integral exercises were created according to the magnitudes of the tempered musical system (the corrected Pythagorean formation of the sounds), the results obtained in the application of the auditory tests and the hypothesis of the attraction of the sounds. For each of the groups and subgroups of the subjects in the classroom, different blocks of exercises were created.

The main idea was to establish the balance of the ear you need to “go up" (ascend), "lower" (descend) and "fix" the physiological structure of the auditory system or its part. It should be mentioned that to this day in science there is no definite and clear answer of how the peripheral and central auditory system works in the process of listening in tonal discrimination.

Well, from the point of view of the problem, the following is specified, for example: that for children of subgroup I (negative alteration of the right ear) they need some exercises to "raise" the physiological structure of the ear; for children of subgroup IV, they need some exercises to "lower" the called structure.

According to hypotheses of the attraction of sounds and the anatomy of the cochlea, the idea of using the small intervals (2m and 2M) in fingerboard of an octave in the voice and ear area of the child in the form of upward and downward movement with harmonic support, considering the classical harmonic laws and rules was embodied. The thing is that the use of intervals (2m and 2M) only without harmonic support has no relation to the tonal mode.

This situation causes the chaotic formation of sound structures. In this case there is a need to order the movement of the tones by means of the harmonic rules that allow the movement of the attraction between them.

The exercises were created based on the tempered musical system that is constituted by the tones formed in two fundamental structures, which were approved and determined historically and by the sound space (tonal ambitus) that is around the human being: one is the complex modal tetrachord, and another is the octave. The sounds of exercises were formed by the principle of the functioning of the aforesaid structures, i.e., by the principle of attracting stable and unstable sounds (passive and active).

For the formation of auditory knowledge and development of the tonal ear the exercises must be heard and sung at the same time, although the systems of the phonation and auditory apparatus are linked with the afferent and efferent pathways. Likewise, the control of speech and listening is carried out with these systems. The exercises are sung with the vocal lyrics (A, E, I, O and U) in certain sequences. Therefore, the exercise blocks were created with the purpose of increasing the strength of the student and the teacher in the acts of hearing and singing, at the same time controlling the tonal change and enlarging their will in the activity of listening. The increase in strength (ability) is defined and the development of tonal ear balance is demonstrated. The student and the teacher with such intelligence can discriminate the tone because their relationship in the classroom communication is attuned.

Based on the material presented through the research, software "NOMOS1.0" will be created, a program for the development of the auditory system of the student and the teacher. The word "nomos" of Greek origin means the germ of the most extensive melodic formations, an expressive turn that occurred in a certain region of the voice.

Functions of NOMOS 1.0

- Principle: to establish the Balance of the Tonal Ear for listening it is necessary to "go up" (ascend), "lower" (descend) and "fix" the psycho-physiological structure (mind-knowledge) of the auditory system or its part.

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- Student/teacher from results of Tonal Ear Balance execute through NOMOS 1.0 in the form of a game the auditory-phoniatric musical exercises, developed by the Greek, Byzantine, Italian and German theories about the hypothetical structure of the attraction of sounds (Figure 5).

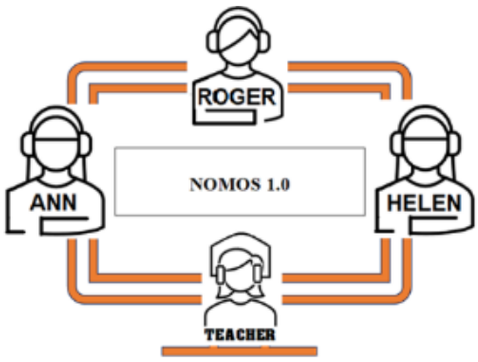

Figure 5 Learning, I think. Application of the software NOMOS 1.0

The child develops thinking

An important point of the goal of education is the formation of the Human Being who defines himself as a thinking man. Humanizing education is an objective of world politics. Pedagogy with its human essence is guided to the path of cognitive development of the faculties of man, so requested in society. Among the intelligences of the subjects of the school classroom in Basic Education is appropriated the development of the auditory system around the balance of the tonal ear.

Increasing the cognitive ability to discriminate tone in both the speaker and the listener means the development of the auditory system, the necessary condition in the pre-reading stage. For this, it is necessary to diagnose the auditory state (tonal ear) of the speaker and the listener, to later implement a program of adjustment and balance of the ear.

Conclusion

The intelligent system, cognitive and sensory software, which includes the programs TOTEM 1.1, TOTEM 1.2 and NOMOS 1.0, is a kind game in the form of guessing for children and adolescents, which allows to acquire necessary information, analyze, present results for the development of the tonal ear and its balance in the auditory system of the Human Being.

The pre-reading stage was completed with the establishment of tonal ear balance and the formation of phonetic-phonological knowledge and skills, so necessary so that the child can begin to learn to read.

EVERYONE HEARS, EVERYONE LISTENS!

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