

## EVERYONE CAN MASTER MUSICAL INSTRUMENTS: IKEDIMMA OKEKE'S PROPOSED THEORY OF ADAPTIVE MUSICOLOGY IN PERSPECTIVE

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### **Abstract**

'Adaptive musicology' is a novel theory proposed by the author in the quest for solution to the challenges of learning musical instruments among children and young learners. It posits that, 'for a meaningful and fulfilling musical experience, learners should be guided through musical specialties which they are adaptable to by virtue of their respective native endowments'. This theory is drawn from the 'theory of adaptation' in the field of Animal Biology which sees adaptation as 'the development of physical and behavioral characteristics that allow organisms to survive and reproduce in their habitat'. For instance, the possession of gills, fins, scales, cold blood, and streamlined bodies by most fishes represent their adaptive features which aid breathing, swimming, balance, body temperature, and moving with minimum resistance in water respectively. Fishes do not find it difficult to breathe and swim in water because it is most natural and native to them. Lions, tigers, and cheetahs develop specialized dentition, sharp vision, and speed which enable them to adapt in the wild. It follows that by nature the fish is programmed to live in the water just as the lion in the wild. The fish cannot survive on land neither can the lion adapt successfully in the water even though it can manage to swim through occasionally. The adaptive features of these animals come from their respective genomes. Relating this to humans we also discover that human features regarding height, dentition, body shape, tongue size, lip structure, finger and toe size, lung capacity, musculature, intelligence, temperament, voice timbre, etc., are basically a function of their genome for various adaptations in life. Applying this theory to the learning of musical instruments, it becomes interesting to argue that the potentiality to excel in a given musical instrument is traceable to the individual's adaptive features. That is, the capability to adapt successfully to the learning and mastery of a given musical instrument is native to the individual. Because every musical instrument poses peculiar challenges in learning, it becomes necessary for the learner to be prepared for such peculiar demands and to choose the musical instrument/s that he or she can naturally adapt to. The piano demands long, thin, and strong fingers and learners with shallow and short breaths, under-bite, and cleft tongue should be guided away from the brasses and woodwinds because of their demands for good breathing, tonguing, and embouchure.

**Key words:** *adaptive musicology, adaptation, adaptive features, genome, musical instruments*

### **Introduction**

#### **Background to the theory**

Musical instruments come in various shapes, materials, and mechanisms of tone production. Some are tubular, some are conical, while some do not have conventional shapes. Some are blown, some plucked, and some struck, while some are manipulated with the fingers to produce sound. These peculiarities present challenges in learning the instruments. By virtue of their shape and mechanism of sound production, musical instruments demand certain physical and physiological soundness from the learners as criteria for learning and mastering them.

An analogy with sports elucidates the point: just as the human physiological and physical build form the basic criteria in sportsmanship, music also presents a similar situation. Football

requires people with strong limbs, and stamina for a ninety-minute active engagement, while swimming requires flexible legs and hands with good lung power to sustain its demands in the water. Every sport, as it were, presents the 'adaptive features' it requires from the enthusiast. Musical instrument playing is even more complex owing to the fact that they are numerous and each one appears with its peculiar features and difficulties. As a result, the physiological and physical preconditions for learning them are many and these are the concerns of this theory.

### The Case of Vocal Music

This theory has been subtly operational in vocal/choral music but unfortunately has been neglected in instrumental music and as a result has created much frustrations for musical instrument learners. In vocal music, people are grouped as soprano, alto, tenor, or bass depending on the ambit or range of their voice which is demonstrated on the musical scale with middle C as the focal point.

The four basic vocal groups or parts named soprano, alto, tenor, and bass, along with the variants, mezzo-soprano and baritone, are distinguished by specific ranges which are illustrated below:

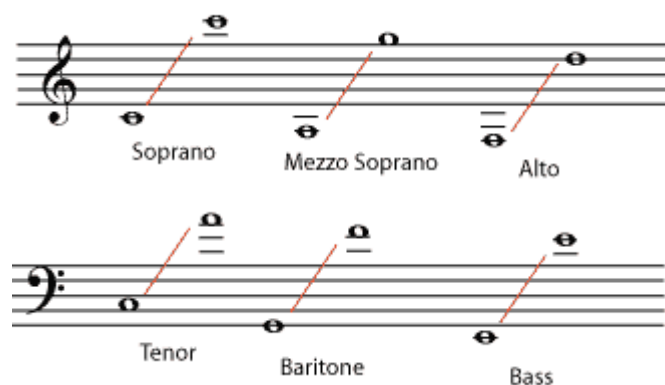


Image 1. Human Vocal Ranges

Some people will manifest the vocal features for soprano and some for other parts and this is based on the principle of adaptability. Requesting a natural bass voice to attend to soprano lines would be frustrating because he lacks the vocal capability to adapt to that part. This principle has been ignored in instrumental music where learners are asked to pick at random any musical instruments of their choice or by the assignment of the teacher and this haphazard approach appears to be the reason for the frustrations experienced by musical instrument learners for ages. The random approach has been accommodated in instrumental music pedagogy because an empirical research on 'adaptability' for musical instruments is lacking and this is the focus of this theory.

### Statement of the Problem

Musical instruments by virtue of their varied shapes and complex mechanism of sound production require certain physical and physiological preconditions from the prospective learners. Teaching and learning musical instruments is always a tasking adventure for both the teacher and learners owing to the challenges posed by the nature of the instruments. Some of the challenges and preconditions for learning the instruments are good dentition, thick lips, firm tongue, and healthy lungs for blown instruments; long and slender fingers for the keyboards and strings; strong body musculature for the percussions, among many others. Many

learners, after some time, become frustrated in learning some musical instruments because of improper guidance or choice of instruments they cannot adequately adapt to.

### **Expounding on the Theory of Adaptive Musicology**

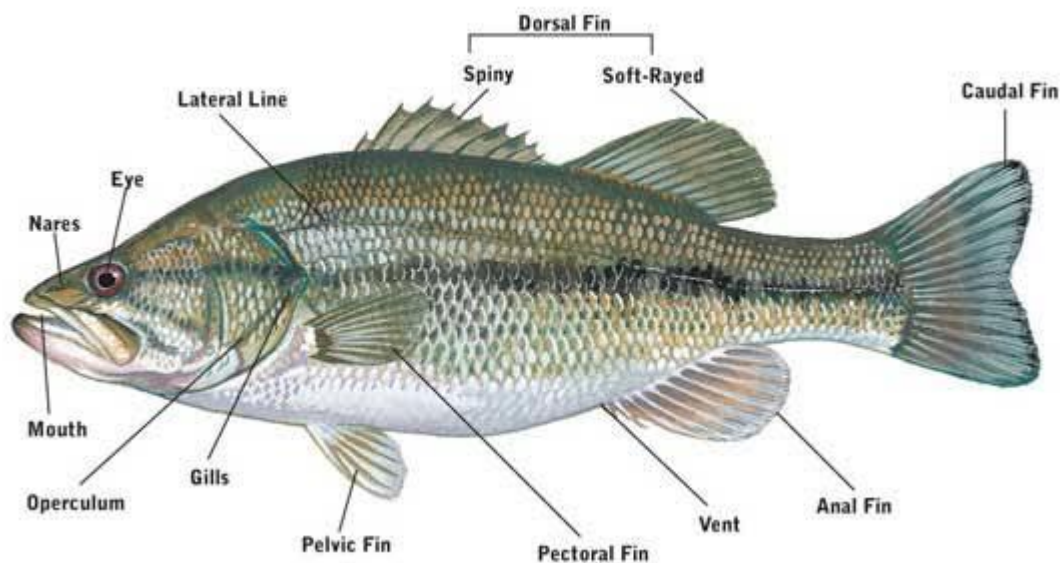
Naturally every living organism has features it engages in surviving in its environment or habitat. Just as the fish has adaptive features for the water; the lion has peculiar adaptive features for the wild; the same way human beings have peculiar adaptive features that sustains them in engaging in all their human activities of which playing musical instruments is one of those peculiarities.

### **Seeming contradictions**

This theory appears contradictory if taken from the perspective of natural adaptation drawn from the theory of evolution where adaptation refers to the ‘process or state of adjusting or changing to an environment; the trait as a result of the process’ (Wikipedia, 2021). Here evolutionists try to explain that organisms with eyes or hands had not these features at a certain point in their evolutionary chain but developed them in the course of trying to fit into their habitat. For instance, it has been reported that ‘before snakes slithered, they had limbs similar to those of lizards. To better adapt to their environment of small holes in the ground, they lost their legs’ (Wikipedia, 2021). Even though this aspect of adaptation may help explain the adaptability of multi-instrumentalists and polyglots but adaptation has also been explained as ‘a heritable physical or behavioral trait that serves a specific function and improves an organism’s fitness or survival’ (Wikipedia, 2021). From this second perspective came the notion of ‘adaptive feature(s)’ which is defined as ‘an inherited feature that helps an organism to survive and reproduce in its environment. Adaptive features are the inherited functional features of an organism that increase its fitness and survival in its environment (Wikipedia, 2021).

The second perspective is the basis of this theory and shall form the working definition of the theory. Relating to this music we can see that the organism’s ‘environment’ mentioned shall be taken as the learner’s prospective musical instrument.

- **Adaptive features of tilapia fish to live in water (Image 2.)**



1. It has fins that help it swim in water
2. It has gills that help it breathe in water
3. It has specialized eyes for viewing objects in water
4. It has scales and streamlined body to make its body slippery for easy movement in water

▪ **Adaptive features in lions to survive in the wild**

1. The brownish skin color of the lion enables it in hunting for prey as it camouflages in dry grass which is also brownish in color of the grass
2. They have a strong sense of smell which helps them to detect their prey with ease
3. They have sharp vision that permeates the darkness of the night and their surroundings.
4. They have strong leg muscles which help them to run very fast to catch their prey.

**Objectives of the theory**

The objectives of this theory are to address:

- The relationship existing between human physiology and musical instruments
- Why learners fail in some musical instruments and succeed in others
- The actual demands of musical instruments on learners.
- To identify the ‘human adaptive features’ for various musical instruments.
- To establish standard physical/physiological checks of adaptability for learning various musical instruments

**Scope of the theory**

The theory is applicable to various aspects of musicology but currently the emphasis is on instrumental music which is a highly demanding and challenging aspect of musicology. Both Western and non-Western musical instruments are under study. Instruments of the various families of woodwind, brass, stringed, percussion, keyboards, membranophones, chordophones, idiophones etc., are all within the scope of the study.

**Methodology**

The methodology for the application of the theory for reliability is presented here in detail. The procedure shall be experimental in nature. Children and young learners shall form the samples for the research experiment. The population will be sampled in groups of about four for learning musical instruments from four families of Western orchestral instruments which will include the keyboards, strings, brass, and woodwind. Every group will start as ‘beginner class’ and will receive rudimentary lessons on the given instrument for a period of time. The

groups will also be monitored for progress or regress within the period. Careful observation will be sustained for each group throughout the experiment to record levels of progress, regress, challenges, difficulties, and adaptability. The samples that showed improvement on their instruments within the period would be moved to the intermediate class and used as the control sample while the samples that showed little or no improvement would be retained in the beginner class and monitored again for the purpose of ascertaining the factors responsible for their little or no progress. If the sample completely showed no progress afterwards, it would be moved to another group of instruments as beginners to see if there would be any level of progress in the new group. This will apply to all the groups while the control model/sample is kept stable in all the respective groups. The data from the progress/regress chart will be reviewed periodically and subjected to analysis for the inferential deductions on adaptability

### **Some human adaptive features for Musical Instruments**

With regards to guiding learners in choosing musical instruments and a fulfilling instrumental experience, Hoffer (1991) cautions that:

only general guides can be offered regarding what instruments should be assigned to individual learners. If a youngster face lengthy session with braces on his or her teeth or has an underbite(lower teeth in front of upper) or crooked teeth, the student should be guided away from brasses. Generally, small students should not try large instruments. Boys who have thick fingers should be encouraged to try instruments other than violin, because notes in the higher positions are too close together to allow for thick fingers without some kind of compensatory movement, which is difficult. Whose pitch sense is below average should especially avoid stings, French horn and trombone (Pg.239-240).

Several other adaptive features for musical instruments exist and they are listed below:

1. Cognitive ability for tone recognition and discrimination
2. Well-developed hands and fingers for carrying and playing musical instruments
3. Specialized lips, tongue, and mouth for wood-winds and brasses
4. Healthy lungs for sustaining air pressure in blown musical instruments



**long, slender and firm fingers for keyboard instruments**





### **Holding and playing the trumpet**

Regarding the physiological and physical requirements for playing the brasses, Hunt and Bachelder (1994) advise that:

Before pursuing the performance of a brass instrument or selecting appropriate candidates for an instrument, consider certain requirements: (i) proper lower and upper jaw alignment, (2) straight teeth, (3) lip formation conducive to vibration, and, (4) adequate muscular development of the lips. If any one of these four requirements is not met, performance on a brass instrument will be difficult, if not impossible (p.17).



### **Image 3a. Long and thin fingers required for playing stringed instruments**

#### **Nature/Nurture Controversy**

It would be necessary at this point to rehearse the nature/nurture controversy as it concerns the present theory. Nature school argues that all that an organism needs to survive in its environment is already endowed by nature while the nurture school believes that one is born 'tabla raza' that it is the environment that nurtures up an organism. This theory has taken the position that the potential to learn a given musical instrument is native to an individual which can be harnessed through proper guidance and tutelage.

### **Some Human Physical\Physiological defects and their implications in learning Musical Instruments**

- **Underbite**

An underbite is a term for a dental condition characterized by lower teeth that extend outward farther than the upper front teeth. This condition is called a class III malocclusion or prognathism. It creates a bulldog-like appearance in the mouth and face (Wikipedia, 2019).



**Image 7. Underbite**

The person with the dental condition of underbite should be guided away from brass and wind instruments. The reason is clear: his dental structure cannot accommodate proper embouchure, lip buzzing, articulation, and tonguing peculiar to the winds and brasses.

- **Rheumatoid Arthritis**

This is a chronic inflammatory disorder affecting many joints, including those in the hands and feet. In rheumatoid arthritis, the body's immune system attacks its own tissue, including joints. In severe cases, it attacks internal organs (Wikipedia, 2019).



### **Image 8. Rheumatoid Arthritis**

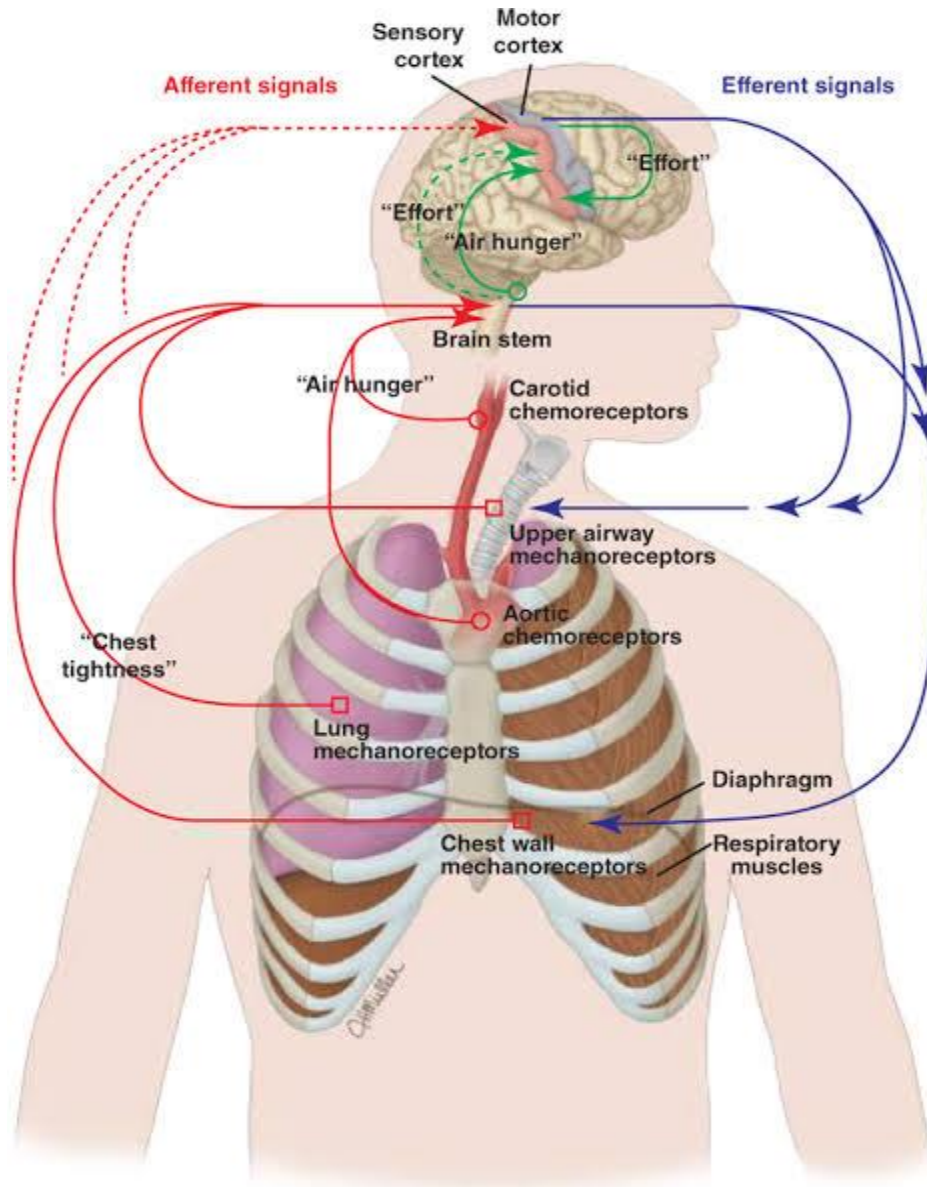
This condition creates serious impediments to learning any musical instrument because of the deformity it leaves on the fingers.

- **Dyspnea**

This is a subjective sensation experienced and described differently by patients but generally characterized by:

- Shortness of breath
- Unpleasant breathing
- Labored, difficult, or heavy breathing
- Uncomfortable sensation when breathing
- Unable to get enough air
- Breathlessness
- Air hunger
- Choking
- Suffocation





Source: J.L. Jameson, A.S. Fauci, D.L. Kasper, S.L. Hauser, D.L. Longo, J. Loscalzo: Harrison's Principles of Internal Medicine, 20th Edition Copyright © McGraw-Hill Education. All rights reserved.

**Image 11. Dyspnea (Wikipedia, 2019).**

People with dyspnea should be guided away from brass and wind instruments because of their intensive air demand. Even when one with the condition reluctantly or out of ignorance engages on the winds and brasses; he or she would never achieve mastery because of the complications that would emanate.

The problems resulting from dyspnea is not particular to instrumental music but even to vocal music because of the role of the diaphragm and lungs in producing notes.

**Significance of the Theory**

The theory is a relevant development in the field of musical instruments pedagogy owing to the awareness of the benefits of playing musical instruments and the upsurge in the zeal for learning musical instruments amongst children and people across the world. Musicologists and educators world over are increasingly becoming conscious of the place of learning musical

instruments in the holistic development of the child. It behooves music educators then to properly guide children in choosing the appropriate musical instruments which they can adapt to for a fulfilling instrumental experience. The outcome of further research on this theory would be beneficial to musicologists, educators, instrument tutors, policy makers in education, music curriculum planning, and prospective musical instrument learners. The theory will also address the usual procedure and practice of random choosing of musical instruments by learners and the haphazard assigning of musical instruments to learners by instrument tutors without recourse to physical and physiological adaptability checks on the prospective learners.

### **Limitations of the Theory**

- Children's cognitive and physical developments

The theory should take cognizance of the fact that children are still growing and as a consequence, their natural and purported adaptive features can never be set until they reach adulthood. Therefore, any claim of their adaptive features at the stage of childhood would be mere presumptions.

- Tone Deafness

Some people are naturally tone deaf- incapable of distinguishing sounds, and as a consequence, cannot adapt properly to any musical instrument learning no matter how physically adaptable they appear.

- Deficiency and Variability of some musical adaptive features in a given individual

- Multi-instrumentality

The major exception to the theory of adaptive musicology is that some people show multiple positive adaptability to various musical instruments and thereby becoming multi-instrumentalists.

### **Summary of the Exceptions to the theory**

There are some apparent exceptions and limitations to this novel theory and they are summarized below:

- The major exception to the claim of the theory of adaptive musicology regarding musical instrument learning is that certain people have the ability to learn and master so many musical instruments in their life time and this negates the idea of adaptability to a particular musical instrument.
- It is difficult to ascertain when an individual has completed his/her physiological development in order to decide which musical instrument he/she can excel in.
- Practice is a sensitive factor that can alter a presumption regarding an individual's progress or regress on a musical instrument
- Keeping 'adaptive features' constant does not always guarantee that other factors such as passion, improved practice time, motivation, adequate tutorship etc., required for mastery are in place.
- The theory appears to have taken a position of complete musical hopelessness for individuals with certain physiological dysfunctions but trends in music therapy show evidences of various types of psychological and bodily restorations such as in cases of autism in children, Alzheimer, dementia, stroke, etc. through engagement in music – singing, music listening, drumming, and clapping to rhythm, etc.

- More so, people with some kinds of physical defects can still excel in some other musical instruments they can adapt to irrespective of their defect. For instance, a child who has been guided away from blown musical instruments because of the maxilla-focal defect of underbite, can still excel in learning the guitar notwithstanding. It is on this backdrop that Campbell, P. S. and Scott-Kassner, C. (2010) argue that:  
Because there are so many different types of physical disabilities, it is important that the music teacher know the specific needs of each child in order to adapt instruction for them. The goal for all of these children is physical independence, participation, and control (Pg.415).

### **Recommendations**

The theory of ‘adaptive musicology’ is a novel one and requires time and proper application to pull through hence these recommendations:

- There is need for scholars, music educators, and musical instrument instructors to research more on the applicability and reliability of the theory regarding instrumental pedagogy.
- Further research should also be geared towards developing an empirical parameter for administering ‘adaptability checks or tests’ for learning musical instruments.
- Teachers of musical instruments should endeavor to draw a clear line between ‘learning musical instruments for fun’ and ‘learning musical instruments for mastery’. The former does not require so much regimentation because the target of the learner is music appreciation but the latter requires principled engagement, regimentation, and guidance to succeed.

### **Conclusion**

Everyone can learn and master musical instruments if they are properly guided. The guidance should basically be taking into cognizance the learners’ adaptive features for the chosen musical instrument. If there is viable passion, motivation and good tutorship for a chosen musical instrument but there is apparent inadequacy in the peculiar human adaptive features required for the instrument, the entire exercise would become futile

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