

Dr. Charles R. Jackson

Assistant Professor of Music
Kennesaw State University

Author: *The Band Directors Book of Secrets*,
available as an eBook through Amazon Kindle, Barnes and Noble, and iBooks

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SESSION - AVOID ALLOWING THE PANDEMIC TO BECOME A BANDEMIC:

An alternative to mouthpiece testing as a method of guiding student instrument selection

With the current environment focused on increasing awareness of spreading germs, band directors have a heightened concern surrounding current systems for assessing students for instrument selection/assignment in the fall. Many band directors still use a method involving students trying mouthpieces for the various instruments. Some use a rotation system moving from one table to the next where guest-clinicians or other band directors give students a score based on immediate success or failure on each mouthpiece. The coordinating band director receives the data from this rotation process and makes the final decisions. The problem is that most students can make a sound on every mouthpiece. Consistency and consensus among a large panel of clinicians involved with the assessment process are difficult, if not impossible, to achieve. This session focuses only on an alternate strategy for assessing wind players without the use of a mouthpiece. This session does not include a discussion about the assessment process for percussion.

During this unprecedented pandemic, band directors are justifiably concerned that their recruitment will be adversely impacted with parental concerns over the spread of germs, especially when recognizing that no such danger exists when students decide to join the choir or orchestra. At least in band rehearsals throughout the school year, students' mouths are covered (or plugged) while playing wind instruments, which significantly reduces the chance of spreading germs compared to singing in a choir or breathing into the open air in a strings class.

The purpose of this session is to offer an alternative method for band directors to consider when progressing through the instrument selection/assignment process. I formulated this technique based on research conducted by a University of Illinois student, combined with some of my research, and does not involve mouthpiece testing. I have successfully used this system for assigning instruments since 1981 and throughout my 34-year career as a Director for Bands at the middle school, junior high school, and high school levels.

Several concerns served as my motivation to develop this "new" system. First, I wanted the process to require as little time as possible so that I could promptly begin instruction. Other methods take up to a full week or more to complete as all students try every mouthpiece for all woodwind and brass instruments. This new system takes three days to complete. My next concern is for the many students poorly matched with an instrument leading to frustration, failure, and ultimately discontinuation of membership in the band program. This new system takes advantage of research to more accurately predict immediate and continued success on the assigned instrument and guides students to avoid instruments that are less compatible with their physical attributes. This instant success has a direct impact on retention of students. Lastly, I was concerned about the spread of contagious diseases that could occur as a result of multiple students trying the same mouthpiece even after the use of a cleaning solution. Research suggests that ethylene oxide, a powerful and dangerous chemical, is the only chemical solution that can control the germs found in band mouthpieces. Long-term exposure to ethylene oxide can irritate the eyes, skin, nose, throat, and lungs, and damage to the brain and nervous system. The EPA has concluded that ethylene oxide is carcinogenic to humans by the inhalation route of exposure. **YOU WILL NOT FIND THIS CHEMICAL SOLD IN A SPRAY BOTTLE IN YOUR LOCAL MUSIC STORE.** By eliminating the need to use mouthpieces, this method is safer for students and teachers and less likely to spread germs from one student to another. Please review a copy of the posted article titled "Evaluation of the microbial flora found in woodwind and brass instruments and their potential to transmit diseases" from 2011. The use of anything other than ethylene oxide does more for cleaning our conscience than it does for cleaning the mouthpiece.

No method is perfect. My experience, however, has only fortified my opinion that the process described in this session produces more desirable results than many I have encountered over the past 41 years, which includes seven years of teaching at the collegiate level.

Issues Encountered with Mouthpiece Testing

- The mouthpiece testing system usually involves a panel of musicians involved in assessing students. Consistency among these individuals is difficult to achieve and is affected by their experience and expertise.
- All students can make a sound on all mouthpieces. Assigning a score is highly subjective and inconsistent among assessors.
- Each assessor is unaware of the results from other assessors during the process. It is highly unlikely to achieve a balanced instrumentation for your band, not to mention the balance considerations in the future for the high school band program.
- Some assessors check the mouthpiece but do not attend other critical issues such as hand size and ankyloglossia. The assessor needs to consider a student's hand size before assigning a student to the alto saxophone. Hands that are too small to reach around the instrument will bump the side keys while attempting to properly place the pads of the fingers in the proper place.

Background on the Research that Inspired my System

While at the University of Illinois (Urbana-Champaign) pursuing my master's degree in 1981, I stumbled across a computer program created by a student as part of their research. The program described the physical features of a potential band student. It directed me to select which band instrument would provide the student with the most predictable chances of success based on research. If I chose the correct instrument, then the program would congratulate me, followed by a list of information from research that supported the instrument selection. If my choices were incorrect, then the program would provide supporting information explaining why the student would experience difficulty either during the initial months of instruction or at some future point as the physical demands increase for each specific instrument. In 1981, the computer was not capable of presenting me with an image of the student because Al Gore had not yet invented the internet. The only description of the student's physical attributes was in a written format.

Before beginning my coursework at the University of Illinois, I had just completed my first two years as a band director at the junior high level. I was amazed by this information provided by this computer program and became obsessed, spending endless hours of my free time working with the program. From the information gleaned from the research presented in the program, combined with additional research of my own, I developed a checklist that I used when assigning instruments to my newly recruited students. I realized that some physical features were compatible with more than one instrument. There were also "red flags" that indicated specific instruments students should avoid.

It became apparent that if I were going to make this system work, I would need to educate both my students and their parents in the process. I presented parents and students with information from the research predicting success on the various instruments. This information explained the impact of the embouchure, dental structure, and other physical aspects of the tongue, hands, and fingers on the development of a characteristic sound and the development of technical skills. I presented a performance demonstration on each instrument to help students become familiar with the instrument options available and to familiarize them with the characteristic sound of each instrument. During the latter part of my career, I had an assistant who would assist with the demonstrations. Students and parents were encouraged to conduct a self-evaluation at home. Students submitted a list of no less than three instruments that they would consider as a choice after they experienced the performance demonstrations and received instruction on the best physical features for success.

After students officially registered for the band class, I would use my checklist and begin my assessment of each student. This process usually took no more than three consecutive class days. Students worked on worksheets and other content-specific activities to occupy their time while I worked through the individual assessments. At the end of the three-day process, I would take all assessment checklists, along with the list of three options from the students, and create my instrument assignment list, establishing my balanced instrumentation. In my early years

of teaching, all students in the band program attended the same high school. Later in my career, I taught in a school system that divided my middle school students between two or more high schools. It became necessary to add another item to the checklist to identify which high school students would attend. I used this information to help guide my decisions toward building balanced instrumentation for the high school programs as well. This information served as an essential consideration because my middle school students would not enjoy a rewarding high school experience if those ensembles did not also have a balanced instrumentation.

Rarely, if ever, did I assign a student to an instrument not included on their list of choices. Students created their list with the knowledge of the requirements for success. This system provides the student with the feeling that they had critical input into the instrument selection process. I am convinced that the main factor that encourages students to continue enrollment in the band program year after year, along with their parental support, is their perceived feeling of success.

A student assigned to an instrument based solely on the fact that they "like" the instrument, with no consideration for their chances of success, is more likely to experience frustrations and discouragement, leading them to drop band before they experience success. There is always a chance the student could have selected the correct instrument by chance. Leaving success up to chance usually results in half the band performing well and the other half in the same grade level needing extensive remediation. Success should be built into the process and not left to chance. When teaching in situations where there were two bands for each grade level, I structured those groups with equal instrumentation, equal size, and equal ability. This equal division into two groups was possible because I did not train or prepare students to become members of a lower-level band.

Pedagogical Responsibilities

Assigning students to the instrument providing the least resistance to success does not excuse the band director from following an effective pedagogical process for each instrument. For example, the trumpet player with the perfect physical setup for success on the trumpet will not experience success if the mouthpiece is the wrong size or improperly placed on the embouchure. Likewise, the clarinet player with the perfect physical setup for the clarinet will not experience success by holding the clarinet at an improper angle, using a reed that is not compatible with the mouthpiece, or failing to use proper air support.

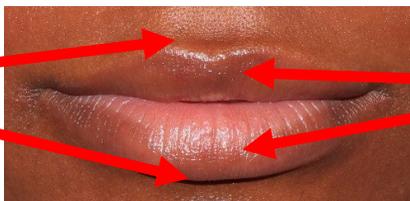
One of my favorite quotes is from Philip Farkas in his book titled "The Art of Brass Playing" (page 32): "...there are so many other soul-satisfying musical instruments available that it does seem most logical to consider your physical assets and liabilities before choosing anything as important as the instrument to which you may very well devote thousands of hours (not to mention dollars!) during the course of your lifetime."

Assess for Success

Sit directly in front of the student, face-to-face, during the assessment process. Unless otherwise noted, assess the student's face while it is relaxed (neutral), and the teeth are slightly separated. Eyes need to remain open, and the upper and lower lips need to make gentle contact. Avoid squeezing lips tightly together. Have the student look straight ahead with a relaxed face.

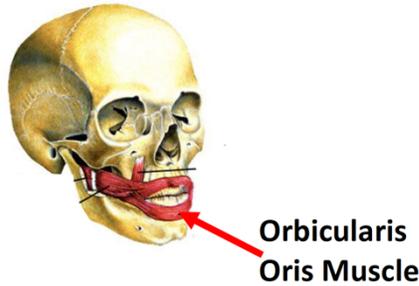
Assess the vermilion: Based on how much of the vermilion is visible within the vermilion border, identify it as very thin, thin, moderate, or full. For brass instruments, you want the bite (inside edge of the rim) of the mouthpiece to touch the skin of the face ABOVE and BELOW the vermilion border. Low brass players use a higher mouthpiece placement, and trumpet players use more of a 50/50 placement. The outer area of the vermilion is dry, and the inner surface of the vermilion is wet and shiny. The moist, shiny area of the vermilion should not be visible outside of the mouth while a student is playing—the only exception being for the flute.

**Vermilion
Border**



Vermilion

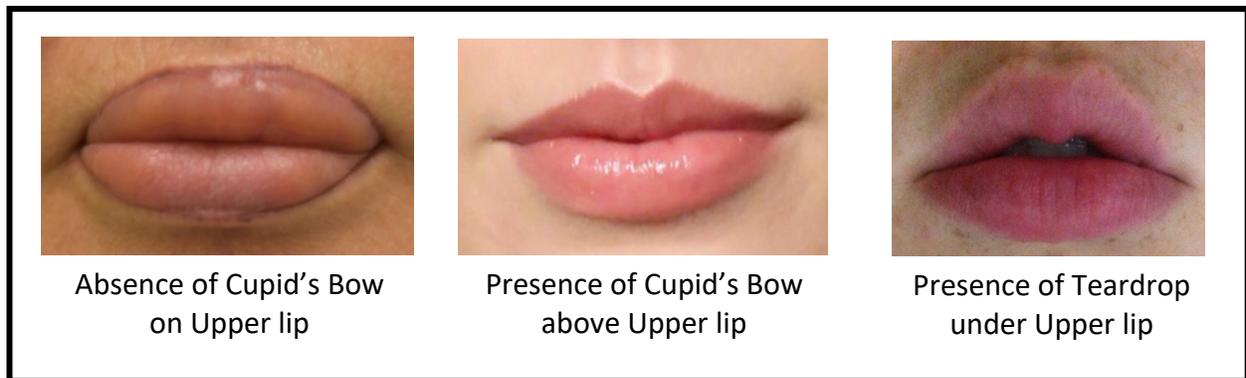
- **Assess the orbicularis oris:** With the student maintaining a neutral facial expression, assess the general thickness of the orbicularis oris muscle from front to back (outside to inside). This muscle acts much like a ligature for the embouchure. Identify the orbicularis oris as thin, moderate, or thick.



- **Assess mouth width:** Noting the width of the mouth from corner to corner, identify as narrow, medium, or wide. For brass players, you want to see the corners of the mouth extend beyond the outside diameter of the mouthpiece rim. It is easy to see the corners of the mouth in the photo below of Gene Pokorny, Principal Tuba with the Chicago Symphony Orchestra. The corners will be set and somewhat focused toward the mouthpiece while playing. Avoid assigning an excessively wide mouth to a small-diameter brass mouthpiece and avoid having the corners of the mouth covered by the mouthpiece.



- **Assess teardrop and cupid's bow:** Have the student gently separate their lips so that the upper and lower lips DO NOT touch. Note if there is a teardrop present on the bottom side of the upper lip. Note if there is a cupid's bow present on the vermilion border of the upper lip. A pronounced teardrop could be a "red flag" for flute players as it divides the airstream into opposite directions. For brass players, a pronounced teardrop could result in excessive tissue vibrating inside the mouthpiece. A cupid's bow could be a positive indicator for brass players, especially for trumpet players, because it helps to bring the upper vermilion border and orbicularis oris inside the bite of the mouthpiece.

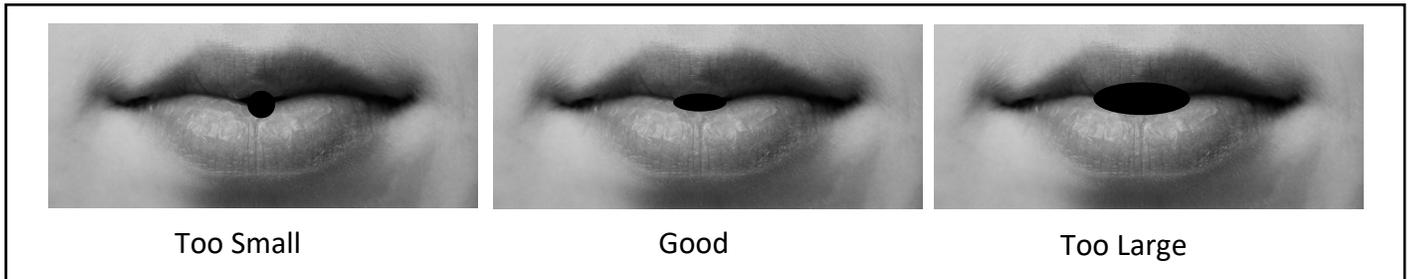


- **Assess philtrum length:** Have the student gently separate their lips so that the upper and lower lips DO NOT touch and have the student maintain a neutral expression. The philtrum is the area between the top edge of the vermilion border upward toward the bottom edge of the nose (anterior nasal spine). If you can see a large portion of the student's upper teeth, then identify the philtrum as "short." If you can see just a tiny amount of the upper teeth, then identify the philtrum as "average." If you cannot see any amount of the upper teeth, identify the philtrum as "long." A longer philtrum is more conducive to a mature double-reed sound. The student with a long philtrum does not need to stretch or overextend the upper lip to form a proper embouchure. This lack of over-stretching results in a warmer sound and allows

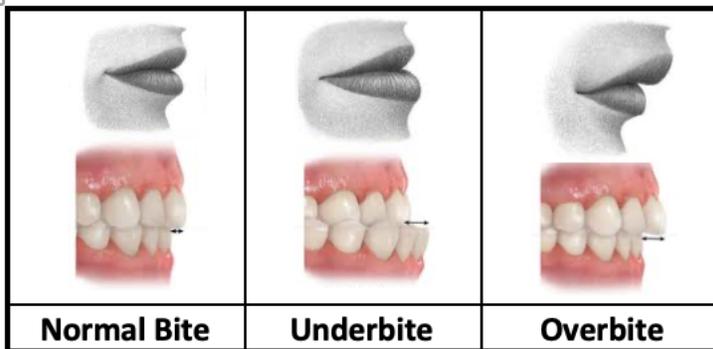
the student more control of the reed. A longer philtrum facilitates proper mouthpiece placement for low-brass instruments. **NOTE:** If the student has very short upper teeth, then the philtrum could be short while still completely covering the upper teeth. In this case, the oboe is a good choice, but you would want to steer away from low brass if there is insufficient space between the upper vermilion border and the anterior nasal spine.



- Assess aperture size:** This assessment is mainly to help identify those most likely to experience success on the flute. With the student placing their index finger in front of their mouth, have them gently blow air on the fingertip as if gently trying to bend the flame of a candle. The natural aperture size appears while the student is gently blowing air. If the aperture is a tight and tiny circle, then identify it as "too small". If the aperture is about the shape of an almond, then identify it as "good". If the aperture is wide or very tall, then identify it as "too large". Apertures that are too large or too small will result in a thin, airy sound and could prove very difficult for students to gain enough control of the aperture to produce a clear, characteristic sound. If this process takes too long, students will experience frustration and lose motivation to practice.



- Overbite:** Ask the student to clench their teeth, then separate their lips so that you can see if the upper teeth overlap the lower teeth, if the lower teeth protrude beyond the upper teeth, or if the student has an even bite where the edges of the upper and lower teeth meet. The lower jaw will move slightly forward while playing an instrument to achieve a flattened chin. With an overbite, this will bring the upper and lower teeth in line with each other. With an even bite, this could result in an underbite position. The interaction of the muscles attached to the orbicularis oris muscle makes it challenging to perform comfortably with an underbite on a brass instrument. An underbite contributes to the improper mouthpiece placement for woodwind instruments. An exaggerated overbite is considered by some professionals to facilitate a characteristic warm sound on the bassoon (if accompanied by a long philtrum). However, some professional bassoonists use an even-bite embouchure.



- **Assess edge evenness of lower and upper front teeth:** After assessing the overbite, have the student slightly drop the lower jaw to create an opening between the upper and lower teeth. Assess the evenness of the center-most teeth as they will provide the embouchure support for brass instruments and will impact the proper positioning for the clarinet and saxophone. If the lower teeth are uneven as shown below, this could cause discomfort in the lower lip for saxophone and clarinet students. If the upper teeth are uneven, then the mouthpiece for the clarinet and saxophone will tilt toward the shorter tooth. Both will cause embouchure issues and can also lead to articulation issues. Teeth that protrude forward could dig into the inner lip tissue causing discomfort and pain. Make a note if the student is wearing braces on their teeth.



- **Assess the hard palate:** Ask the student to open their mouth wide and look up toward the ceiling. Identify the hard palate as low, high, narrow, or wide. A low palate could cause issues for clarinet by not allowing the tip of the mouthpiece to enter the mouth at the proper angle. Usually, those with a low palate hold their clarinet too high, which lowers the mouthpiece inside the mouth. This improper instrument angle hurts tone and articulation. Very wide palates seem to provide for a full air column as it impacts the backside of the embouchure leading to a more open and warm tone on tuba. If a student has a very narrow palate, you would want to make sure it is also high before recommending a low brass instrument. Make a note if there is a cleft palate issue that would impact a student playing a wind instrument.



- **Assess for ankyloglossia:** Ankyloglossia is probably one of the most frequently missed conditions assessed during an instrument selection process. However, its impact is critical for the future success of wind players. After evaluating the hard palate, while the student's mouth is still open, ask them to stick out their tongue and curl the tip of the tongue toward their nose. A student with ankyloglossia will not be able to pull the tip of their tongue away from the lower alveolar ridge of the lower teeth because it is connected by the lingual frenulum, as shown below. The lingual frenulum pictured below is attached to the tip of the tongue as opposed to the "usual" position underneath the tongue and farther toward the back. In many cases of ankyloglossia, the lingual frenulum is so short that the student cannot pull the tip of the tongue as high as shown in the photo. I would never assign a student with ankyloglossia to a brass instrument or the flute because proper articulation requires that the tip of the tongue reach and make contact with the alveolar ridge behind the UPPER teeth.

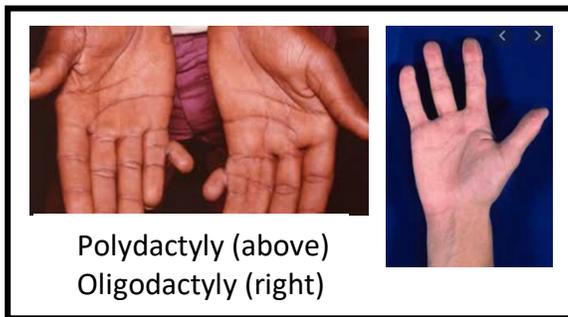


Serving as a guest clinician in several middle schools and high schools in several states provides opportunities for me to work with students experiencing chronic tonguing issues. It is not uncommon to discover a large percentage of these students have ankyloglossia, but it has gone undetected for many years. These students have not tongued properly since their first year in band. There is nothing anyone can do to fix the issue short of a surgical procedure (frenectomy). BE CAREFUL never to tell a student or a parent that the student must have this procedure done because the parents can force the school system to pay for the surgery if the teacher says it is required.

Depending on the frenulum length, a student with ankyloglossia can experience success on a reed instrument. The tongue placement for reeds is lower in the mouth than the alveolar ridge behind the upper teeth. The tongue tip placement, however, is farther back in the mouth because the tip of the reed is slightly farther back than the surface of the back of the teeth. The student will need to have enough flexibility in the lingual frenulum to place the tongue in the proper location for the assigned instrument.

- **Assess for polydactyly and oligodactyly:** Polydactyly is a condition where a person has more than ten fingers, and oligodactyly is when a person has less than ten fingers. Take a moment to check the student's hands before making the final instrument assignment. Ulnar polydactyly is by far the most common where a student has (or had) an extra finger growing from the lowest joint of the pinky finger.

Have the students show both hands with fingers extended and spread apart. Flip the hands over to check both sides for any signs of surgery that might impact the function of the fingers. With ulnar polydactyly, you will see a scar along the lower joint of the pinky finger. If you see this scar, there is no need to say anything to the student, but you should ask them to wiggle their fingers for you. Not all parents inform their child about the removal of an extra finger at birth. I have seen situations where the surgery resulted in nerve damage to the pinky. If this is the case, and the student has no control of their pinky, then you must avoid clarinet, sax, flute, oboe, and bassoon. If the extra finger is still present, there is usually no nerve damage. If a student has oligodactyly, then simply make sure that they have enough functioning fingers to operate the assigned instrument properly. While checking the hands, also check for any paralysis or other physical issue that would limit the use of the hands.



- **Assess hand size, finger length, and finger thickness:** While checking for Polydactylism and Oligodactylism, also make a note of the student's hand size, finger length, and finger thickness. The main point here is to make sure a student's hands are not too small to reach around an alto sax without bumping all the side keys. The side keys on a saxophone are positioned rather high compared to the side keys on the clarinet. Combined with the extra width of the saxophone body, students with tiny hands quickly become frustrated. Try to avoid assigning students with excessively thin fingertips to the clarinet. Their inability to fully seal the tone holes will result in frustration.



Small vs. Large Hands



Wide vs. Thin Fingers

Interpreting Your Findings

1. No matter how much you want to have every student join the band, do not recommend a student play a wind instrument that is impossible to play. It is a better choice to suggest that the student consider percussion, join the choir, or join string class if there is truly no wind instrument that will work. My experience has shown this only to happen enough times for me to count on one hand.
2. Don't assign a student with a very large or very tiny aperture to the flute.
3. Don't assign a student with severely uneven teeth to clarinet or saxophone (edge of teeth).
4. Don't assign a student with ankyloglossia to a brass instrument or flute. Depending on the severity, the student might be able to do a reed instrument.
5. Don't assign a student with an excessively wide mouth to trumpet or horn.
6. Don't assign a student with a very narrow mouth to a low brass instrument where the mouthpiece covers the corners of the embouchure.
7. Don't assign a student with a short philtrum that exposes a considerable amount of the upper teeth to the oboe—the more upper teeth covered by the philtrum, the better.
8. Don't assign a student with a short philtrum to tuba, and depending on the length of the philtrum, you might need to avoid trombone and euphonium as well.
9. Don't assign a student with a very large overbite to the trumpet.
10. Don't assign a student with a large amount of visible vermilion and a very thick orbicular oris muscle to a small brass mouthpiece. The bite must reach the edge or slightly beyond the edge of the vermilion border. If the vermilion is full, but the orbicularis is not thick, then the student might be able to adjust enough for success.
11. Don't assign a student with a very low hard palate to the clarinet.
12. Don't automatically assign a student without a right hand to the horn if the embouchure is not compatible.
13. Don't assign a student with tiny hands to the saxophone. The hands will bump all side keys in their attempt to place finger pads in the correct spot.
14. Don't assign students with skinny fingers to the clarinet.
15. Don't assign students with tiny hands to the oboe.
16. A large overbite is favorable for an excellent bassoon sound. Most dentists destroy our greatest bassoon embouchures.
17. A pronounced cupid's bow is a plus for trumpet players because it helps to bring the orbicularis oris into the bite of the mouthpiece.
18. A wide and high hard palate is favorable for an excellent low brass sound.
19. If past surgery for polydactyly has resulted in nerve damage to the pinky, then avoid all woodwind instruments. If the condition impacts the left hand, then also avoid strings.
20. Oligodactyly will impact instrument selection depending on which fingers are available and usable.

Summary

By going through this quick assessment process as outlined above, you will significantly increase the chance for student success and for continued participation in the band program. There will be no surprises one, two, or three years down the road when the student hits a wall and can't progress further.

Instructional pacing will be quicker and smoother due to the decreased need to stop and assist struggling students. Consequently, more instruction will occur during each rehearsal. Classroom and behavior management will be more efficient due to the decreased need for frequent stops and "downtime" for the class. A higher percentage of students will reach higher levels of performance during the middle school years when matched to the most compatible instrument.

Pedagogical Responsibilities: A student on the correct horn needs proper guidance. Don't use the right tool in the wrong way as if holding the metal head of a hammer and hitting the nail with the wooden hammer handle. Students need to know HOW to use their embouchure correctly and how to support that embouchure with the air.

While traveling throughout Georgia and other states to serve as a guest clinician or conductor of regional honor bands, I see the impact on student performance by not attending to the issues discussed in this presentation before making final instrument assignments. Practically every problem associated with characteristic tone

production, range, endurance, articulation, flexibility, and finger technique can be traced back to physical incompatibility with the instrument, as discussed in this session.

It is not possible to lengthen the philtrum, thicken the orbicularis oris muscle, thin out the vermilion, raise the hard palate, or disconnect the lingual frenulum by increasing practice time at home or by increasing the amount of time playing the instrument during the school day. No matter how much the student likes a particular instrument, they will grow to dislike it when faced with frustrations that are caused by issues beyond their control.

As I teach students at the collegiate level in my Woodwind and Brass Techniques classes, all students must learn to play all instruments. Many of these students experience difficulty trying to play an instrument that is not ideally compatible with their physical assets.

I have served on instrument assessment panels at many schools over the past seven years. I have seen the resulting issues with inconsistency among assessors and the impact on creating a balanced instrumentation. I have seen students come to my assessment table during a rotation process with an assessment form showing the highest possible score for an instrument that they will physically be unable to play well.

By following some of the suggestions presented in this session, hopefully, your band students will experience success quickly, will reach higher performance levels sooner, and remain involved with instrumental music longer. Your ensembles will achieve a more mature sound beyond their years of experience within the time allotted for instruction during the school day.

Contact Information:

Dr. Charles R. Jackson

Assistant Professor of Music

Kennesaw State University

Cell Phone: 678-832-9663

E-mail: Zeppole3@gmail.com

Web: www.DrCRJackson.com

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KENNESAW STATE UNIVERSITY
COLLEGE OF THE ARTS
 School of Music

Assistant Professor of Music
Student Embouchure and Hand Assessment

Student Name: _____

Vermillion					
Very Thin		Thin		Moderate	
Orbicularis Oris					
Thin		Moderate		Thick	
Mouth Width					
Narrow		Medium		Wide	
Teardrop			Cupid's Bow		
None	Moderate	Pointed/Pronounced	None	Moderate	Pointed/Pronounced
Philtrum Length					
Short		Average		Long	
Aperture Size (flute)					
Too Small		Good		Too Large	
Overbite Assessment					
Underbite or other Malocclusion	Even Bite		Overbite		
			Normal/Moderate		Wide
Edge Evenness of Lower Teeth					
Straight		Slightly Uneven		Very Uneven	
Edge Evenness of Upper Teeth					
Straight		Slightly Uneven		Very Uneven	
Hard Palate					
Low		High		Narrow	
Ankyloglossia					
Back ("normal")		Moderate		Mid-Front	
Polydactyly					
No Indication	Present		Evidence of the Removal of Extra Finger(s)		
			Nerve Damage		No Apparent Nerve Damage
Oligodactyly					
No Indication		Present		Left Hand # Fingers	
				Right Hand # Fingers	
Hand Size					
Small		Moderate		Large	
Finger Length					
Short		Moderate		Long	
Finger Thickness					
Thin		Moderate		Full	

NOTES:

(Include a list of any devices installed inside the mouth such as braces, palate expanders, etc.)

For your summer reading, check out
The Band Directors Book of Secrets
 by Dr. Charles R. Jackson

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