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Robyn King
rmk55@zips.uakron.edu

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Clarinet Pedagogy:
Common Challenges and Solutions

Robyn M. King

The University of Akron
Williams Honors College
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Since its musical debut around the year 1700, the clarinet has been adjusted, morphed, and shaped into what performers and composers needed it to be. Arguably, the clarinet is one of the largest families, ranging from the mysterious sopranino A-flat and infamous E-flat to the low vibrations from the contrabass in B-flat. Clarinets in keys such as C, D, and A-flat were designed in order to accommodate the needs of composers. However, those instruments have been lost to history due to the ability to transpose music for our now modern B-flat clarinet. After hundreds of years of designing and redesigning the clarinet, it is interesting to imagine why there are still so many common problems with playing it. Even with multiple brands from different countries like the French Buffet's or the German Rossi's, no one system has been deemed "perfect." Students still are challenged by this cylindrical piece of wood. What makes the clarinet still such a difficult instrument to master, and how can we help students more efficiently face the obstacles they come across?

The first mention of the clarinet is from J.S. Dopplemeyer in 1730. He wrote "At the beginning of the present century, he invented a new sort of pipe, the so-called Clarinette, to the great satisfaction of music-lovers." The 'he' in Dopplemeyer's statement refers to Johann Christoph Denner, who is credited with inventing the very first model of the clarinet (Brymer, 1976). Denner's first clarinet had a long cylindrical bore and only two keys. These two keys were used by the left hand while playing. On a modern clarinet, these two keys are the throat tone A-key and the register key. Through time, more keys were added by numerous people who wished to improve Denner's original design, such as the five-key clarinet, the six-key clarinet (designed by Xavier Lefevre), and the thirteen-key clarinet (designed by Ivan Muller). Other inventors were also working on their own clarinet designs at the same time, however, the five-key, six-key, and thirteen-key clarinets are the ones that are most widely known. Two clarinetists, Hyacinthe Klose and Louis Buffet, designed a new system of clarinet that was first seen in Paris in 1839. Their design was modeled around Theobald Boehm's fingering system for the flute. This

instrument's number of keys and rings is nearly the same as on today's modern instrument: seventeen keys and six finger rings (Brymer, 1976).

The earliest reed was created hundreds of years ago, though no one knows an actual year or time. Foundations for future woodwind instruments were set when someone accidentally split a dry piece of wood in half and happened to discover that it created a 'squawking' sound when air was blown against it. This 'reed' became the earliest form of a double reed. A little while later, it was discovered that a piece of wood put up against a notch in the body of a tube also created a single vibrating surface—the first instance of a single reed. From then, single reeds were cut in all different kinds of shapes and sizes for instruments such as the zummarah, arghoul, and the pibgorn. Several years later, the chalumeau is known to have had a single reed as well, along with a tapered mouthpiece, rather than the common sawn-off end of a pipe. The earliest clarinet mouthpieces and reeds were more squared off rather than rounded, and the reed faced upward rather than downward on modern instruments. Because of these extreme changes to the mouthpieces and reeds, embouchure changes were drastic and attempting to master playing in tune was difficult for performers (Brymer, 1976).

There is no one "perfect" clarinet or clarinetist in the world. There have been masters, yes, however, masters still have to practice and refine their artistry to improve. Professional clarinetists still squeak, and have done so on live recordings or in major concerts. So, if these professionals still have trouble, how can we expect young students to produce characteristic tone on this tube of wood, with a mouthpiece, and a vibrating piece of cane? Students are also faced with the trials of putting down the right fingers and doing so correctly. Yet the clarinet requires cross fingerings and pinky work and knowing when to use what finger and when, which can easily become confusing. Then there is a register key, not an octave key, which requires students to learn a whole new set of pitches that go with fingerings, not even counting the altissimo register. Furthermore, different pitches on the clarinet have

different pitch tendencies and everything from an incorrect finger placement to tongue position can affect that pitch.

A Northeast Ohio private clarinet teacher with two degrees in clarinet performance, over ten years of teaching experience, and students in high chair placements in multiple schools, observed that, while each section in a band has its struggles and challenges, the clarinet section generally tends to have the most diversity among ability levels. There is a wide variety of reasons as to why clarinet students could struggle so much. The purpose of this paper is: A) to identify challenges to clarinet students through band director surveys, B) to conduct research into top challenges, and C) provide exercises and solutions that students and teachers can use to address the identified challenges.

Method

This project sought to identify aspects of clarinet playing that pre-collegiate students often have the most difficulty with. In order to gain as much insight as possible, a short 11- question survey was created that included questions about student struggles, private lessons, and how time was spent during school band periods. The survey was constructed through Google Forms, and the questions and format are included in Appendix A. The questions were developed through consideration of the author's own experience, suggestions by professors and collegiate friends, and commonalities found in practitioner journals such as *The Instrumentalist*. The survey was then sent electronically by email to 42 Northeast Ohio Band Directors. The directors were identified through experience, suggestions by professors and colleagues, and online searches for additional local school districts. As a whole, they represented rural, urban, and suburban districts, and elementary band, middle school, and high school levels.

After two weeks of availability to the educators, the surveys were analyzed and recorded. In order to keep the un-biased nature of the research, the teachers, emails, and schools were all anonymous. Educators chose top challenges their students face from a list presented in the survey, and

each response is identified within the results. The top four responses were researched by identifying and studying journals and other sources, such as *The Instrumentalist*, *The Clarinet*, *Journal of Research in Music Education*, *Music Educators Journal*, and *International Journal of Music Education*, that give information about those specific challenges as well as helpful tips and suggestions for clarinetists of all levels. Separate sections of this paper are dedicated to each of the top four responses, explaining the common problems that students face within those specific areas, the correct technique that students should use with each of the issues, and the ways in which teachers can help students improve. Finally, to further assist teachers and students improve and learn, method books such as *Rubank's Method Books*, *Baermann Studies and Etudes*, and band method books such as *Standard of Excellence* were analyzed. Author-composed exercises that correspond to the top four common problems are included at the end of this paper in Appendix B as a tool that can be used and shared with anyone.

Results

A total of 42 Northeast Ohio band directors were contacted with the survey. 26 of the directors responded, yielding a 62% response rate. The first question on the survey prompted educators to select up to five possible challenges that their clarinet students face most often. The top four responses were register changes, tongue placement (vowel shape), correct fingerings, and pitch/ intonation. Full results of the first survey question are found in Table I.

Table I. Statistics for Clarinet Student Challenges

Challenge	Number of Responses	Percentages of Responses
Register Changes	18	69%
Tongue Placement (vowel shape)	15	57%
Correct Fingerings	14	54%
Pitch/Intonation	13	50%
Finger and Tongue Coordination	8	31%
Finger Speed	7	27%
Articulation Speed	7	27%
Squeaking	7	27%
Articulation Styles	6	23%
Alternate Fingerings	6	23%
Slurs	3	12%
Attacks/Releases	3	12%
Phrasing	2	8%
Voicing	2	8%
Preparatory Breath	1	4%
Rhythm	1	4%
Embouchure	1	4%

Furthermore, the educators were then asked to rank six techniques (embouchure, posture, air, finger work, instrument carriage, and tonguing) in order from the most time spent refining in rehearsals to the least. Embouchure was ranked first most often. The full results can be found in Table II.

Table II. Statistics of Time Spent Rehearsing

	1 (Most)	2	3	4	5	6 (Least)
Embouchure	16 (61.5%)	2 (7.7%)	3 (11.5%)	3 (11.5%)	1 (3.9%)	1 (3.9%)
Tonguing	1 (3.9%)	5 (19.2%)	2 (7.7%)	7 (26.9%)	9 (34.6%)	2 (7.7%)
Finger Work	3 (11.5%)	4 (15.4%)	5 (19.2%)	4 (15.4%)	4 (15.4%)	6 (23.1%)
Instrument Carriage	3 (11.5%)	0 (0%)	5 (19.2%)	5 (19.2%)	6 (23.1%)	7 (26.9%)
Posture	0 (0%)	8 (30.8%)	5 (19.2%)	6 (23.1%)	5 (19.2%)	2 (7.7%)
Air	3 (11.5%)	7 (26.9%)	6 (23.1%)	1 (3.9%)	1 (3.9%)	8 (30.8%)

Because the director responses were anonymous, it is not possible to tell which directors, and which grade levels, struggle with each of the options. Of the twenty-six directors, 14 (53.8%) indicated that they hold weekly sectionals for each individual instrument, where students receive small group

work with a director. 12 directors (46.2%) do not have weekly sectionals in their school. 23 directors (88.5%) do not employ an outside clarinet specialist while 3 directors (11.5%) do employ a specialist.

14 educators (53.8%) indicated that their district employs 4 or more licensed band directors, 6 educators (23.1%) indicated that their district employs 3 directors, and the final 6 (23.1%) indicated that their district employs 2 directors. The directors contacted represented beginning band, middle school, and high school. In each level of instruction, the majority of clarinet sections exceeded 21 students. 15 of 26 directors (58%) indicated that the beginning bands and high school bands have more than 21 clarinetists. 11 of 26 directors (42%) indicated that middle school bands exceed 21 clarinetists. Full results of the amount of students at each level can be found in Table III.

	0-5	6-10	11-15	16-20	21+
Beginning Band	4	2	2	3	15
Middle School	1	2	3	9	11
High School	1	3	3	4	15

Finally, the directors were asked about the availability of private lessons. 22 directors (84.6%) responded that 0-25% of clarinet students in their school take private lessons, while 4 directors (15.4%) said that 26-50% of their clarinet students took lessons. Furthermore, directors were asked, if they knew, how many clarinetists in their district took private lessons. 17 (81%) of directors said that 0-25% of students take lessons, and 4 directors (19%) said that 26-50% of students took lessons. None of the districts require private lessons of their students. 18 directors (69.2%) indicated that private lessons are not required but readily accessible, and 8 directors (30.8%) noted that private lessons are not required and not readily accessible. Finally, 9 educators (34.6%) said that private lessons are offered through the school, 13 directors (50%) said that private lessons were not offered at the school but teachers were

recommended, and 4 directors (15.4%) indicated that private lessons were not locally accessible for their students.

Discussion

When analyzing the results, specifically the data found in Tables I and II, some interesting patterns arise. First and most importantly, it is imperative to notice that every single quality of performance listed in Table I somehow can be categorized with others. The list can be broken down into four groups. The top struggle, “register changes,” is often affected by other aspects such as voicing, embouchure, tongue position/vowel shape, and even a preparatory breath. The second struggle, tongue placement (vowel shape), can be grouped with pitch/intonation, phrasing, voicing, squeaking, and embouchure. Correct fingerings can be grouped with finger and tongue coordination, alternate fingerings, finger speed, slurs, and rhythm. Finally, pitch and intonation can affect and be affected by tongue position, finger and tongue coordination, articulation speed, articulation styles, alternate fingerings, attacks and releases, phrasing, voicing, preparatory breath, and embouchure. Each quality of clarinet playing affects another, and several of the aforementioned groups have overlapping struggles. It is also important to note that rhythm and embouchure were not included in the original list of struggles. One director took time to write in each of these in the available ‘other’ category.

Register Changes

There are four registers on the clarinet. First is the chalumeau register, the lowest register on the clarinet. The register is named after the clarinet’s early ancestor, the chalumeau, and it ranges from low E to first finger F sharp. The throat register includes only four pitches: open G, G sharp, A, and B flat. The next register on the clarinet is the clarion register, spanning from long B to thumb C. The final register is the uppermost pitches, the altissimo register, which ranges from C sharp above the staff to

the uppermost C and beyond on the clarinet. Because the clarinet has a cylindrical shape and is closed on one end, the clarinet only plays in odd numbered partials. This causes the clarinet to have not an octave key, but a register key. Each register (chalumeau to clarion and clarion to altissimo) rises or lowers by a twelfth, so each register requires students to know a separate set of fingerings.

In the director survey, register changes was identified as the top challenge for students by 18 or the 26 directors (69%). Register changes are affected by air support as well as voicing, particularly in the altissimo register. Air support is particularly important for register changes because without enough air from the abdominal muscles, the student will not have proper support for that air to get all the way down to the bell of the instrument. 8 out of the 26 directors that responded to the survey spend the least amount of time on air in rehearsals, and only 3 directors think that air should be where the most time in rehearsal is spent (found in Table II). Based on these results, it seems as though register changes are obstacles for students because not enough time is being spent on the areas that most affect those register changes. If directors focus more on air support (specifically on leaps like throat tone B-flat to long tube B) and finger work (to ensure that students know the fingerings in each register), register changes would be more successful.

Air going through the clarinet goes through the first open hole that is available. When students play a throat tone B flat, the clarinet is approximately 5 inches long (the distance from the tip of the mouthpiece to the register key tone hole). When the student then goes to a B natural, the clarinet becomes almost two feet long (the distance from the tip of the mouthpiece to the end of the bell). If students do not have proper air support behind their sound to compensate for the length change, the clarinet will not respond the way the student, or teacher, wants. It is important for students to have proper air support from the diaphragm and abdominal muscles (Webster, 2001).

In working on register changes with students, it is first important to work on technique. Students and teachers need to make sure all tone holes are fully covered and the correct fingerings are

being used. If a hole is not fully covered, the clarinet can squeak and the student can think that they are doing something wrong when a finger needs to be only minutely adjusted. If going from a throat tone to a long fingered clarion pitch (B through F sharp), a student can put down right hand fingers while playing the throat tone pitch in order to limit the number of fingers that have to change at a time (Webster, 2001). There are two main register keys on the clarinet. The first is the recognizable one: the left thumb register key. The thumb register key allows the student to access the clarion register. The left index finger serves as the second register key to go from the clarion register to the altissimo register (Webster, 2004).

Michael Webster, former Associate Professor of Clarinet and Ensembles at Rice University's Shepherd School of Music, writes a series of articles in *The Clarinet* journal series called "Teaching Clarinet." In his article from June 2001, he makes an interesting comment that could change the way students view the break. Most often, when introducing register changes, teachers use the term "crossing the break," which gives the impression that there is a large gap between the two registers (Webster, 2001). A different way of thinking about this is to imagine you are on one side of a river (the chalumeau register). You now have to cross the river and jump to the other side (the clarion register). The river is an obstacle, it is in your way, and there is no bridge to help you cross. Webster suggests the term "connecting the registers" instead of "crossing the break" (Webster, 2001). "Connecting the registers" gives students the impression that register changes are much more accomplishable tasks.

Tongue Placement (Vowel Shape)

Tongue placement, or position, is part of a clarinetist's overall embouchure, and the two should be taught together. Embouchure is often thought as the way the student's mouth is formed around the mouthpiece, but it is also important to consider the entire oral cavity and tongue along with the shape the lips around the mouthpiece. When looking at the survey results, embouchure was listed as where

the most time was spent in rehearsals by 16 of the 26 directors, or 61.5%. Furthermore, in Table I, only one director indicated that embouchure is a challenge for students. Therefore, students seem to be successful at following teacher instruction when learning embouchure. Teachers must then take it a step beyond what the lips and chin look like visually by considering the tongue position and oral cavity.

The larynx, or voice box, is located at the top of the neck, controls breathing and sound production, and is therefore what controls airflow going into the instrument from the player, not the tongue or embouchure (Gonzalez, 2017). Because of this, students should focus on having an open throat, like that of when one yawns, while playing to ensure that proper air support is being utilized. One can pretend that there is a golf ball in the back of the throat, or that the back of the throat is imitating that of a bullfrog. When a student blows air through the clarinet, the air first bounces around and spins inside the oral cavity before entering the physical clarinet. The moment air exits the mouth, it causes the reed to vibrate which produces the sound on the instrument (Brymer, 1976). Due to the multiple registers on the clarinet and the changing length of tubing for each pitch, each pitch reacts differently and can have a different tendency for intonation (Gonzalez, 2017). A chef would never use the same exact measurements of ingredients for all types of recipes. The same goes for clarinet: the same tongue position and vowel shape cannot be used for every note and register. However, it is important to first learn the basics of proper tongue position and vowel shape.

When a child is first learning to speak a language, they are taught vowels, consonants, how to form words, and how to correctly pronounce them. Words such as owl, airplane, balloon, breeze, and train all require different tongue positions and vowel shapes within the mouth. Even though a word requires a new vowel sound, it does not mean a teacher would not teach that word to a class. The same applies to playing the clarinet. Tongue position is part of a clarinetist's overall embouchure. Embouchure includes the way the mouth is shaped while playing, how the mouth seals around the mouthpiece, tongue position, vowel shape in the throat, and the oral cavity as a whole. Tongue placement can also

have a large effect on a student's ability to articulate in different styles as well as their ability, or inability, to adjust intonation (Webster, 2010). Beginning students may not be initially taught tongue position because more emphasis is placed on simply forming the correct embouchure and making sure the student can produce a basic sound.

There is no one set tongue position for any note or register of the clarinet due to the fact that each player is different and each instrument is different with a unique set of pitch tendencies. General tongue positions should be suggested then adjusted as needed by a teacher or performer. Simply put, the tongue position inside the oral cavity should follow the pitches being played. In other words, the higher the pitch, the higher the tongue. The four different registers can use four general vowel shapes: "aw" (as in law) for the chalumeau register, "oh" (as in Ohio) for the clarion register, "eh" (as in weather) for the throat register, and "ee" (as in breeze) for the altissimo register (Weston, 1976). It is important to remember that through all the vowel shapes, the back of the throat should remain open and relaxed, and that the tip of the tongue should be pointed (Webster, 2010). The tensing of the throat muscles will result in poor tone regardless of the tongue position. Students often have trouble getting out higher pitches on the clarinet because their tongue position is too low. High notes can often be very flat if the tongue position is too low.

Tongue position and syllables can also help students with articulation. Many times, students' tongues are incredibly low in the mouth and when required to articulate, students simply think of hitting the reed with their tongue. Although not in the top four results, articulation, articulation speed, and finger and tongue coordination were all identified by directors as challenges, yet only 1 director spends the most amount of rehearsal time on tonguing. When articulating, the tip of the tongue should go to the very tip of the reed (Ballif, 2011). Also, it is important for students to identify a 'touch point' on the reed where the tip of the tongue touches every single time a student articulates (Guy, 2010). This will not only help with consistency of articulation, but it will force the student to maintain focus on tongue

position and the reed. Syllables and vowel shapes are extremely helpful because they force the student to use a specific tongue position while articulating. For example, try saying 'duh duh duh' multiple times in a row and examine where in your mouth the tongue is. Then, say 'tee tee tee' multiple times in a row and again examine where the tongue is. Vowel shapes and syllables change the tongue position while articulating. Helpful syllables for articulate and staccato passages are 'tee' or 'ta,' and syllables for more legato passages are 'dee' or 'doo' (Ballif, 2011, Webster, 2010). By teaching tongue position and vowel shape to students early on, and not later down the road as a 'helpful tip,' students will be more successful at producing pitches accurately with good tone quality.

Finger Technique

Correct fingerings was identified as another common obstacle that students face. However, finger and tongue coordination, finger speed, and alternate fingerings had several responses as well, so for the purpose of helping students improve, this section of the paper will focus on overall finger technique. Specifically, correct fingerings was the third highest challenge indicated, yet finger work is not indicated by most directors as being the most important aspect of playing to spend time on in rehearsals. In fact, the numbers were fairly evenly distributed, but the most directors, 6 out of 26 or 23.1%, said that finger work was what they spent the least amount of time on in rehearsals. Without knowing the correct fingerings or the technique required to achieve success in a piece, the student will not be able to play a piece in any ensemble. Again, it seems as though directors are not able to identify the students' problems and adjust rehearsals in order to help them improve.

In the early 1800s, an inventor named Theobald Boehm designed a fingering system for the flute. It is misunderstood today that Mr. Boehm designed the clarinet's fingering system. Actually, two clarinetists, Hyacinthe Klose and Louis Buffet, designed a new clarinet and used the Boehm flute fingering system as a model for their new clarinet. Even while the clarinet's fingering system today is still

considered a “Boehm key system,” Boehm himself did not design the modern clarinet (Brymer, 1976). A helpful tip for students and educators to remember is to use the “basic six” (Byo, 2016). The general idea behind the basic six is that if one knows one fingering, for example, a bottom line E on the clarinet, one can add one finger and go down in pitch by one step. On the clarinet, the basic six refers to the chalumeau register bottom line E down through G. Some common finger technique problems involve the left index finger, pinkies, and students avoiding chromatic fingerings.

The clarinetist’s hand position affects how well the student can develop agility. While playing the clarinet, both wrists should be straight, not collapsed. The clarinet itself should be balanced by the right thumb and the embouchure. Many students try to tuck the right pinky below the keys for more support, but this is a bad habit that hinders their ability to play passages that require their pinkies. The left thumb should be straight and point towards 2 o’clock. This will enable the student to fully cover the thumb key as well as depress the register key at the same time, instead of adjusting the thumb each time it is required. Finally, many students often press too hard with their fingers, causing the first joints to collapse inward. All fingers should remain curved and relaxed. If a director turns a student’s hand over and can see circles from the tone holes on the pads of the fingers, the student is likely pressing too hard. Hand position should be balanced and relaxed, not tense (Knight, 2013, Guy, 2012).

The left index finger plays a major role in a student’s ability to successfully change pitch and registers. Many students, when moving the left index finger from the throat tone A key to the F sharp tone hole, lift their finger from the key to the tone hole. However, doing this often causes a ‘blip’ in the sound and the connection is not smooth. Students need to keep the left index finger curved and roll the tip of the finger back and forth from the key to the tone hole. This will assist in not only changing pitches, but also changing registers smoothly (Webster, 2001).

Another common mistake that students make is flipping their fingers in order to play chromatic pitches, rather than use the chromatic fingerings. Flipping is incredibly difficult for students because it

requires contrary motion of fingers, which often causes ‘blips’ in the sound because the flip is not even (Webster, 2012). Occasionally, a clarinetist is forced to flip due to the specificity of the passage.

However, students should be taught *not* to flip. Flipping most often occurs in the left index finger and thumb going from F natural to F sharp and vice versa and in the right hand first and second fingers going between B flat and B natural (and F natural to F sharp in the clarion register). Therefore, teachers need to be aware that this is a problem and know the correct fingerings instead. When going from F to F sharp in the bottom of the staff, students should use thumb F like normal, and use chromatic F sharp which is thumb F plus the bottom two side keys on the right. For the B flat to B natural, students should play B flat like normal with the right index finger down. To play B natural, instead of flipping, use the chromatic fingering with the first finger and the fork key (also known as the banana key or sliver key) with the right ring finger. It would be beneficial for students if the director, when first studying a score, identified the areas with pitches that clarinetists tend to try to flip. When just beginning to rehearse, double check that all of the clarinetists know the correct chromatic fingerings so that no student has trouble and no director finds the challenge the day before a concert.

The pinkies of the clarinetist have an incredibly complex job to do, as each of them have four possible keys to push at any time. Knowing which keys correspond to which pitches and what side to use and when can be very confusing for students. The top pinky key in the left hand is the C sharp key (or G sharp in the clarion register). The other three left hand pinky keys control long tube pitches and each have a ‘buddy’ that a right hand pinky can operate. In addition to the three right hand ‘buddy’ keys, the fourth key (low G sharp or clarion D sharp) can only be operated on the right hand side. Therefore, in passages that have multiple pitches that require pinky keys, students must identify the pattern of alternating right and left pinkies (Webster, 2016). Like flipping fingers, students often build the bad habit of sliding, or using the same pinky to play multiple pinky keys in a row. Directors should look for this and make sure that students do not build this habit. As previously mentioned, while score studying, a

director should identify any parts in the clarinet lines where pinkies are required, and check fingerings early in the process to make sure no bad habits are formed.

Pitch/Intonation

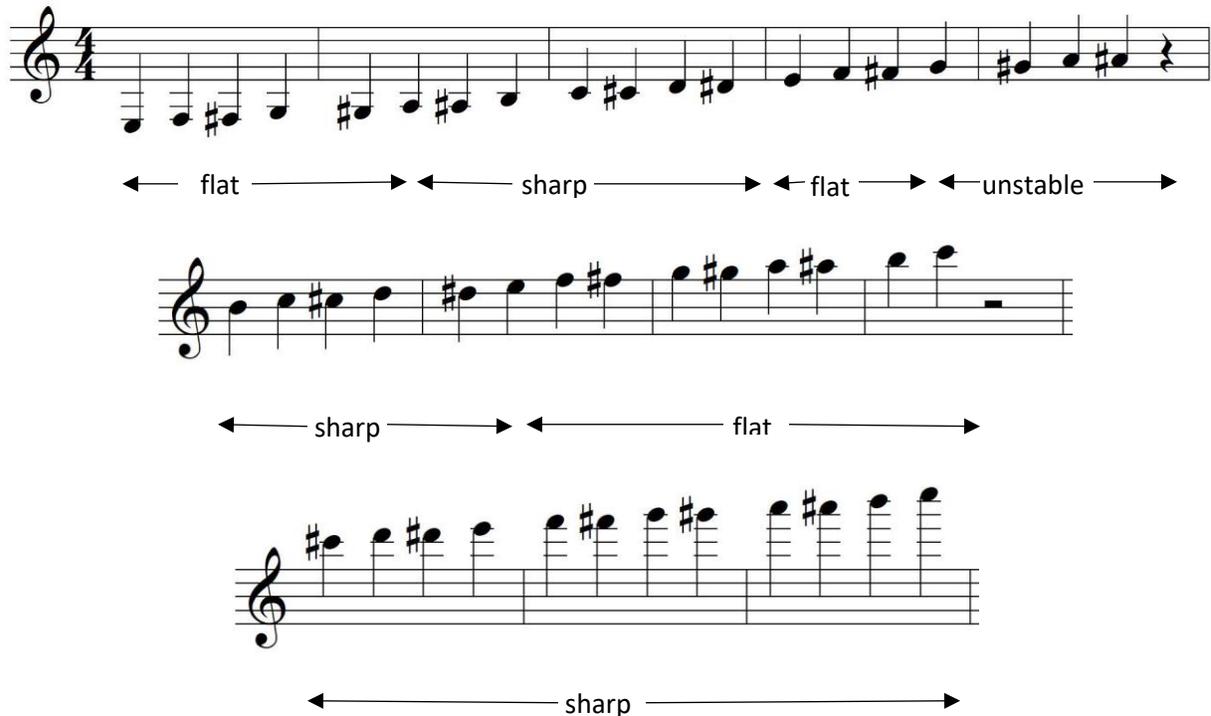
Pitch and intonation are qualities of sound that continue to be worked on and refined throughout a clarinetist's career. There are several variables that can affect the pitch and intonation including the reed (strength, placement, and age), tongue position and vowel shape, the oral cavity, lip placement on the reed, air support, posture, pressure on the reed, resonance fingerings, and even the clarinet itself. The most important part of the clarinet is the reed. Without the reed, there is no sound production. Students should always make sure they are playing on quality reeds that are of appropriate strength. Sometimes, young students are playing on reeds that are too soft, which causes the pitch to become sharp and spread. Beginning students who do not yet understand the importance of rotating reeds and the proper care of reeds may also play on reeds that are chipped or split. While the reed still might 'play,' the intonation of the sound is affected. Students need to play on reeds that are hard enough that they must use strong air support to get characteristic tone, but not so hard that it is strenuous on the student to put air through the instrument (Allen, 2013).

Pitch and intonation were the fourth highest responses indicated by the survey. Similar to tongue position and vowel shape, embouchure plays a role in the pitch and intonation of the clarinet. Based on the survey, embouchure is where the most time is spent in rehearsals. When teachers are first instructing students on proper embouchure, more emphasis should be put on the importance of intonation (and how embouchure can affect it), rather than simply forming the correct shape of the mouth. Making this change in approach during rehearsals will result in more effective teaching and learning. However, 30.8% of the respondents indicated that air was what they spent the least amount of time on in rehearsal, and only 11.5% indicated that air was given the most time.

In order to find the correct position of the embouchure on the mouthpiece, students can perform the squeak test. First, students play an open G, then take in more mouthpiece, play another open G, and take in more mouthpiece. This sequence should continue until the clarinet squeaks. Once the clarinet squeaks, the student should take a little less mouthpiece, and that is the point in the mouthpiece where the student should play to get the best tone (Ballif, 2010). In a proper clarinet embouchure, the lips should form a seal around the mouthpiece but not be tight so much that the students are biting. The chin should be as flat and down as possible, and the corners of the mouth should be in, not pulled back like a smile (Jessup, 2003).

Clarinetists especially have difficulty with tuning and intonation because adjustments need to be made depending on what pitches are being played. Air also is incredibly important for pitch because the clarinet reacts the opposite of other instruments. When playing loud, the clarinet goes flat, and when playing soft, the clarinet goes sharp. Different pitches on the clarinet also have general tendencies of pitch. Typically, in the chalumeau register, the lowest long tube notes on the instrument are flat, from about A to E-flat tend to respond sharp, and about E to F sharp tends to be flat. All of the throat tones can be variable in pitch. In the clarion register, long B through E-flat tends to be sharp. Clarion E natural through C tends to be flat, and the altissimo register tends to be mostly sharp (Webster, 2008, Hadcock, 1999). The pitch tendencies of the clarinet can be viewed in Figure I. In order to adjust for these tendencies, the embouchure can be utilized. By putting less pressure on the reed, pitch will be lowered. By adding more pressure on the reed, pitch will be raised (Webster, 2008).

Figure I. Pitch Tendencies of the Clarinet



The physical clarinet can also create pitch and intonation issues for students. First, temperature plays a large part in pitch, as for all instruments. If the clarinet is cold, the instrument will be flat. As the temperature rises, so does the pitch of the instrument (Webster, 2008). Therefore, it may take longer for clarinetists to sound in tune with the rest of the ensemble. It typically takes the clarinetist longer to warm up than other instruments because the wall of the body of the instrument is thicker. The tuning note that is used is important because it effects which joint the student adjusts. Three areas of the clarinet most commonly used to adjust pitch are the barrel, the middle joint, and at the bell. Clarinetists are usually taught to pull out at the barrel. Most often, bands tune to a concert A or B-flat, both of which are long tube notes on the clarinet. However, clarinetists should pull out at the joint closest to the

tuning note. Generally, bands tune to a long tube note and the students then adjust at the barrel, the adjustment has little effect on the clarinet's intonation.

Instead of using only a concert A to tune the ensemble, a better method for tuning clarinets is a three note process (Byo, 2016). Three notes that clarinetists should use are first finger F-sharp, long tube B, and clarion F sharp. Any pitch that requires only the left hand, such as first finger F sharp, of the clarinetist should be adjusted at the barrel. Pitches that use both hands, such as clarion F sharp, may be adjusted at the middle joint, and long tube fingerings, such as B, should be adjusted at the bell (Webster, 2008). Finally, it is important to keep the instrument clean, specifically the tone holes. Over time, dirt can build up within the tone holes and affect the pitch. In order to keep the tone holes clean, students can occasionally take a dry pipe cleaner and gently wipe out the tone holes (Webster, 2008).

Conclusion

The clarinet section in any band ensemble is usually the largest. Based on the data results, most schools have more than 21 students in the clarinet section in beginning band, middle school band, and high school band. Only half of the directors indicated that clarinet students are able to have weekly sectionals to isolate parts and have time in a small group. Most schools do not employ an outside clarinet specialist, however, it was not indicated how many of the employed directors are clarinet or woodwind specialists. Also, on average, 0-25% of students across all grade levels take private lessons. Therefore, for most students, band classes or weekly sectionals are the only time they are given instruction on how to play their instrument. Realistically, the available time during the school day, scheduling, and the availability of the directors cannot be changed. However, what *can* be changed is a director's approach to instructing students. With such large sections, instruction must be done as efficiently as possible.

By taking the time early in a student's musical career to focus on the accuracy of basics, time can be saved later. Teaching embouchure and tongue position together can help improve intonation. Understanding the rules of clarinet playing such as 'do not slide pinkies' or 'do not flip' can help students determine for themselves the correct fingerings. Isolating difficult leaps and taking them out of context can help improve register changes. It is imperative that directors take the time during score study and rehearsals to identify the spots where clarinetists may have trouble and isolate those sections early in the learning process. Furthermore, by simply taking the time to think about what students are struggling with and where time is spent in rehearsal can help determine whether or not students are effectively assisted and taught.

In conclusion, directors need to spend more time on basics early on in a musician's career, and teach these basics out of the context of a piece of music, or there becomes a risk of the student not accurately transferring the information from one piece to another. Secondly, teachers need to be able to identify the problems that students are having and spend the proper amount of rehearsal time working on musical techniques that can help, rather than spend rehearsal time on more music. If the basics are not consistent and immediate, the music will be more difficult to learn. Third, teachers should not be afraid to use rehearsal time on a warm up and going back-to-basics, no matter the age of the student or ensemble. Using an extra few minutes to focus on tone or intonation will be beneficial later on. By taking the simple steps of adjusting rehearsal time and preparation, clarinet students can be given the tools they need to improve, grow, and succeed.

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APPENDIX A

1. Please select between one and five of the following that your students have struggled with the most.

- Finger speed
- Correct fingerings
- Articulation speed
- Articulation styles
- Tongue placement (vowel shape)
- Finger and tongue coordination
- Preparatory breath
- Register changes
- Alternate fingerings
- Slurs
- Pitch/intonation
- Phrasing
- Attacks/ releases
- Voicing
- Squeaking
- Other

2. Rank the following techniques (1-most, 6-least) by the amount of time spent refining each in your district's beginning band.

	1- Most	2	3	4	5	6- Least
Embouchure						
Tonguing						
Finger Work						
Instrument Carriage						
Posture						
Air						

3. In your district's beginning band, do you have weekly sectionals for each individual instrument?

- Yes
- No

4. Approximately how many clarinetists in your school take private lessons?

- 0-25%
- 26-50%
- 51-75%
- 76-100%

5. If you know, approximately how many clarinetists in your district take private lessons?

- 0-25%
- 26-50%
- 51-75%
- 76-100%

6. Choose the option that best represents what your district offers.

- Private lessons are required of all students
- Private lessons are not required but readily accessible
- Private lessons are not required and not readily accessible

7. Choose the option that best represents what your district offers.

- Private lessons are offered at the school
- Private lessons are not offered at the school but teachers are recommended
- Private lessons are not locally accessible

8. Approximately how many clarinetists are in your program at each level (beginning band, middle school, high school)?

Beginning Band	0-5	6-10	11-15	16-20	21+
Middle School	0-5	6-10	11-15	16-20	21+
High School	0-5	6-10	11-15	16-20	21+

9. How would you describe your school district?

- Rural
- Urban
- Suburban

10. How many licensed band directors are employed by your district?

- 1
- 2
- 3
- 4+

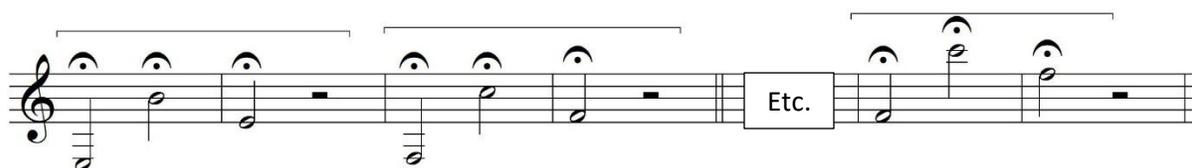
11. Does your school employ an outside clarinet specialist?

- Yes
- No

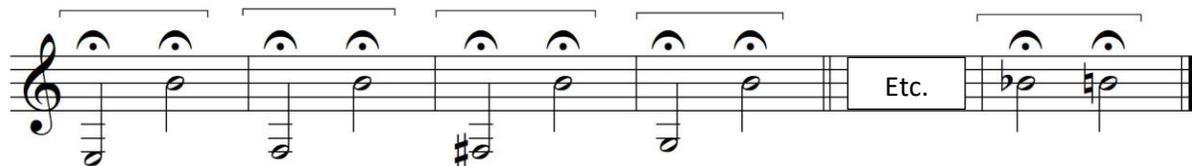
APPENDIX B

Exercises for Register Changes

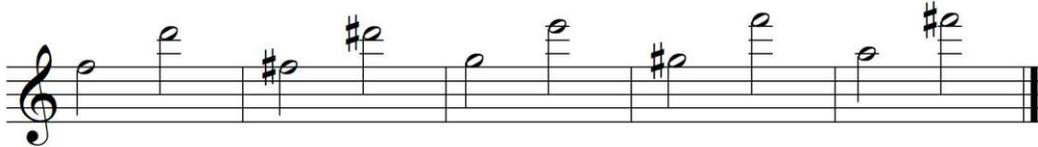
1. Begin on a low E and hold. Add the register key to play a middle line B and hold. Drop down to the octave above the first pitch, first line E and hold. Each three note group (shown with brackets) should be played in one breath. Go up the chromatic scale for each group, follow the same pattern as indicated, and continue up through thumb F as the bottom note. Look to have smooth transitions between the notes, both in adding the register key and then dropping back down to the octave. Students need to be prepared with the fingering of the bottom pitch. Be careful not to slam fingers down and create tension. This can also be used as an intonation exercise in matching intonation between the bottom and upper octave. Play both tongued and slurred.



2. Register changes between octaves: This exercise is designed to help students become more comfortable jumping up to the middle line B, which requires the student to use all fingers. Begin on low E and hold, then play middle line B and hold. Then, the bottom pitch rises chromatically each time with the top pitch remaining the same. Teachers should ensure that the students are using proper fingerings and pinkies while working through this exercise. Every two note group (shown with brackets) should be played in one breath. Continue the exercise until the top pitch is throat tone Bb. Attempt to not “pop” out the middle line B by slamming fingers down quickly; aim to have fluid finger motion for each jump. Play both tongued and slurred.



3. The altissimo register requires a firm (but not biting) embouchure and a high tongue position from the student. This exercise includes leaps to help students play in the altissimo register. By using the 'second register key' of the left index finger, students can play the bottom pitches indicated, remove their left index finger, and produce the top pitch. This exercise should be done slowly with a tuner. To adjust pitch if necessary, students can press the right pinky E-flat key for any of the five upper pitches in this exercise. For the upper F-sharp, the right hand fork key can be used to adjust intonation. When performing this exercise, listen for a smooth transition and focus on a high tongue position to assist in the notes speaking. (Altissimo notes above the F-sharp do not follow the 'lift the index finger' rule, therefore they are not included in this exercise.)



4. Use part of a thirds scale to help practice going back and forth over the break. Other scales can also be used depending on the context that the student requires (ex. practicing going over the break in a piece in D major rather than C major). For this exercise, begin slowly with a metronome. Work toward steady and consistent note values. Once fully comfortable, the tempo may be sped up gradually. Be careful not to 'pop' out the notes by slamming fingers down quickly just to get the right fingering. Focus on fluid finger motion. To assist, students may leave their right hand fingers down on the throat tone G and A (also A-flat and B-flat not included in this exercise) to limit the number of fingers that have to move. However, to make sure that students are 100% comfortable with the register changes, they should be able to play this exercise with or without the right hand down.



Exercises for Finger Technique

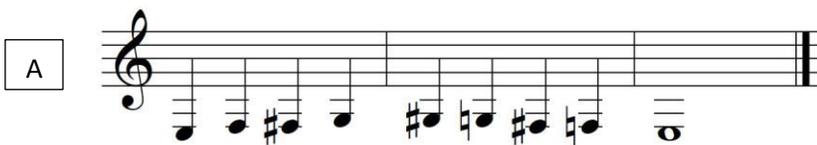
1. Pick any two notes that are sequential such as C and D below. Begin at a slow tempo, gradually speed up, and use a metronome. Do not raise the tempo until the exercise can be played multiple times in a row accurately. Make sure that students' fingers hover closely over the keys at all times. The pitches of this exercise may be adjusted based on the needs of the students. For students just beginning this exercise, begin with two pitches that require only one finger to change. After some time, when students become comfortable, the exercise may be adjusted so that two, three, four or more fingers move at a time. The goal of this exercise is control of the fingers in different patterns. Make sure that students' fingers do not fly far away from the keys and do not slam back down quickly to get to the key in time. Focus on having fluid finger motion. The pattern shown in this exercise (dotted eighth-sixteenth, sixteenth-dotted eighth, triplets, sixteenths) can also be applied to scales or runs in music depending on the students' needs.

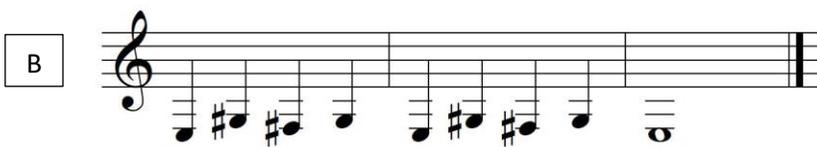


2. This exercise is designed to help students practice chromatic fingerings which avoid flipping. The first exercise, thumb F to F sharp, requires the student to use the F sharp fingering of thumb and the bottom two right side keys. The two side keys should be depressed by the right index finger with the remaining right hand fingers remaining in the normal hand position. Students should not move the entire right hand to use this chromatic fingering. The second and third exercises require the same fingerings, they are simply written in both registers to assist in the students' reading abilities. Both the B natural and F sharp should be played with the fork key by the right hand ring finger. It is important again to have the rest of the hand position remain still and the right pinky still hovering over the pinky keys. Practice these exercises slowly with a metronome and aim to have evenness when changing pitches.



3. Each pinky of the clarinetist has four possible keys to choose from when playing. However, choosing the correct pinky combination (also called cross fingerings) can be tricky for students. Use the following exercises to help determine which pinkies should be used and when (answers are given after all four exercises to give the student a chance to choose a fingering without seeing the accurate one first). For these exercises, focus on fluid finger motion. Try to avoid 'blips' in the sound due to not putting pinkies down fast enough and causing an extra pitch to sound.

A 

B 

C 

D 

Answers:

A: E-L, F-R, F#-L, G | G#-R, G, F#-L, F-R | E-L

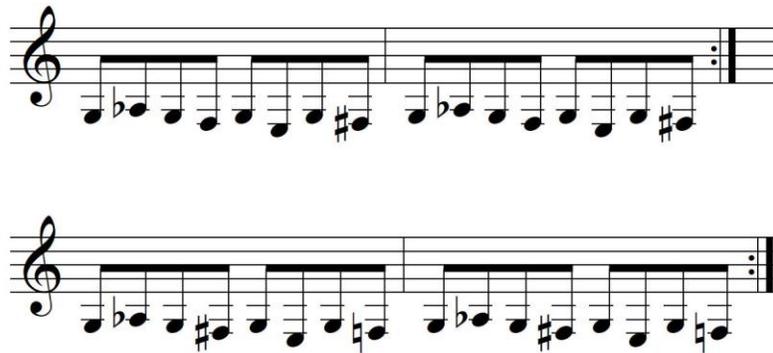
B: E-L, G#-R, F#-L, G#-R | E-L, G#-R, F#-L, G#-R | E-L

C: B-L, D#-R, C-L, B-R | C#-L, D#-R, B-L, D#-R | B-L

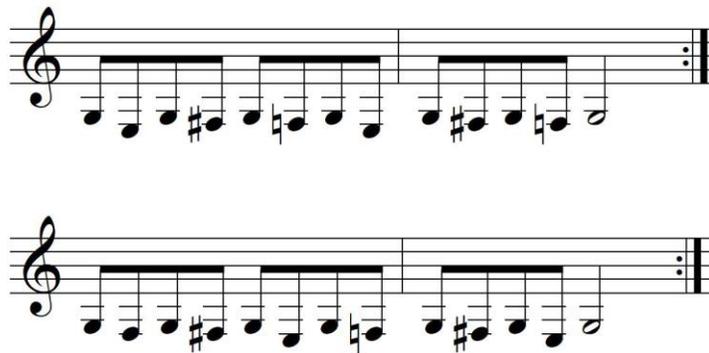
D: C-R, C#-L, D#-R, B-L | C-R, C#-L, D#-R, B-L | C-R

4. Another pinky exercise that is helpful for students forces them to use every long pinky key: all four on the right and the three low keys on the left. The goal of this exercise is to have even eighth notes throughout, as well as even dynamics. The first two lines, as indicated are to be used with the right hand pinky only. The second two lines, also indicated, should use the left pinky only. Begin slowly with a metronome. When a student is comfortable and can play the exercise multiple times accurately, gradually increase the tempo. Be careful of the 'flyaway' pinky. The pinkies should stay close to the keys and remain as curved as possible, not straight and tense. The pinky that is not in use should also remain hovering over the keys at all times.

All Right Hand:



All Left Hand:



Exercises for Tongue Position (Vowel Shape), Pitch and Intonation

Each of these three topics has a large effect on the others, therefore, similar exercises may be used to help all three.

1. Tooting on the barrel is a very good way to focus in on pitch tendencies without the entire clarinet. Have a student remove the mouthpiece and barrel from their instrument. Playing on just the mouthpiece and barrel should produce a top line F-sharp. Students can do long tones and articulate. This exercise should be done slowly and in front of a tuner. The student should focus on having as little tongue movement as possible. The goal is to have consistent intonation through each note value. Also watch to make sure that there is no jaw movement from the student while articulating.



2. Have the student use the four syllables (aw, oh, eh, and ee) on an open G. The transitions between the syllables should be slow so that the student can feel the changes inside his or her mouth. The lower the tongue (aw), the lower the pitch will be. The higher the tongue (ee), the higher the pitch will be. This exercise should be done with a tuner so that the students can visualize where each tongue position results in pitch. Please note that open G can be an 'ugly' pitch on the clarinet. However, it is used in this exercise because it is one of the easiest pitches to manipulate due to the lack of fingers being used. If a teacher so desires, another pitch, such as F or E may be used instead.



3. This exercise is the three note tuning process described in the discussion portion of the paper. The first pitch is to determine whether the student should adjust at the barrel, the second pitch for the middle joint, and the third pitch for the bell. It is important to notice that adjustments go in order of joints from the top of the clarinet down.

