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- Abstract:** The article discusses several indirect teaching techniques that instrumental teachers can apply to help beginning woodwind players learn how to produce their best tone. The strategies presented offer beginning players the opportunity to work together comfortably. The difference between direct and indirect teaching in a music classroom is explored. The factors that contribute to a student playing an instrument with his very best tone including an open throat, sufficient airflow, embouchure or mouthpiece placement, tuning, reeds and mouthpieces, and fingerings are discussed.
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Although music educators in training complete a battery of courses pertaining to the playing and teaching techniques of the instruments that will be found in their future classrooms, the intricate details of learning to play and teach the five Western woodwind instruments successfully are at times overlooked in teacher preparation programs. Unfortunately, it is not until instrumental educators begin to teach that they face series of unique challenges that beginning woodwind students also face when they, too, enter the classroom. Statements such as "Anthony, I know that the oboe is a difficult instrument to play. After all, I couldn't play it well when I was in college" may

not be the precedent that should be set. Treating a student who happens to play an instrument with which the teacher has had limited experience no differently than other students may be a better way to show consistency. Music educators can explain that one learning objective in their instrumental music class will be for students to become proficient in managing the core aspects of their instrument, such as tone, intonation, and fingerings. At the expense of other pressing matters, such as preparing an ensemble for upcoming performance, the learning experiences pertaining to the core aspects of playing an instrument may be sidelined. The purpose of this article is to provide instrumental teachers with classroom-tested strategies that can enhance their ability to provide high-quality learning experiences for their students. While the exercises and discussion included in this article are geared specifically toward woodwind students, many can be easily adapted for teaching other wind instruments.

Teachers usually present content to their students in two ways: through direct teaching and through indirect teaching.[1] Most American educators, regardless of the subject that they teach, present content to their students using the direct teaching approach. Direct teaching occurs in the music classroom when students are provided with all of the information that the teacher has determined should be learned. This teacher identifies and corrects the problems that arise, such as which students are playing in or out of tune. In ensemble rehearsals, this teacher is the sole dispenser of information pertaining to how well a piece of music is performed by the ensemble members. Little if any input is solicited from the students by the teacher. Direct teaching takes a great deal of stamina.

Rather than conditioning students that the teacher will always be the lone provider and distributor of content, students can be better prepared to solve more instrument-specific problems on their own when indirect teaching strategies are integrated into the classroom. Indirect teaching incorporates the use of hands-on or student-centered experiences that ultimately allow students the opportunity to seek answers to their own questions. For example, rather than simply telling a student that he or she is playing the flute out of tune, allow students to experience what playing in tune and out of tune sounds like and feels like. Then, allow students to establish strategies that will help them identify and fix their own intonation problems.

In addition, devote some class time for students to experiment with different kinds of tone production, noting that some sounds are desirable and some are not. Allow students to discover what a representative tone both feels like and sounds like. To get students to be more attentive to the core aspects of playing their instruments, educators need to ask many more questions, such as "What factors contribute to playing an instrument with your very best tone (VBT)?" Several components of VBT include (a) an open throat, (b) sufficient airflow, (c) embouchure placement, (d) tuning, (e) reeds and mouthpieces, and (f) fingerings.

An Open Throat

Keeping a relaxed and open throat can be a difficult skill for students to grasp. When playing their instruments, younger students may not immediately hear the tonal benefits associated with an open throat. Yawning is still one of the best ways to introduce this skill. While we know teachers who seem to frown on students who regularly yawn in class, use the yawn as an opportunity to teach students about how an open throat enhances their tone. When students yawn, have them close their eyes and think about how the yawn feels. "What usually happens before a yawn?" "How does your body prepare for a yawn?" "What usually happens after a yawn?" Students should be encouraged to pay close attention to the way the throat opens before and during a yawn. Students should also be able to describe the breathing that is associated with it. A yawn always begins with a deep and relaxed inhalation of air. The relaxed, open throat enhances the movement of air inward and outward. This yawning process improves VBT production immeasurably. Allow students to produce sounds with a yawn breath and a normal breath. Have students write about and share their yawning experiences in their journal or by completing a simple worksheet. Students can present their results in class and demonstrate how the open throat changes the tone when they play their instruments. The teacher can ask, "How will you remember to maintain the 'open throat' feeling when you play your instrument?" Ultimately, students should strive for a relaxed, open throat space at all times when playing their instruments.

Airflow

Understanding how airflow works to produce VBT is an important process to present to students. When guided, students can develop the breathing skills needed to produce their VBT. However, they may not always incorporate the kind of airflow needed when playing in a large ensemble. Regularly observe and listen to see whether students are maintaining enough airflow to support their VBT. One sure way to determine whether students are using enough airflow is to carefully listen to the ends of sustained pitches. Students can be expected to answer the following questions: "Does my sound change at the ends of sustained pitches?" "At the ends of phrases?" "If so, in what way(s)?" "How can I maintain VBT until the end of a phrase?" In small, homogenous groups, students can work together to develop strategies to improve their airflow. Try the following exercises with your students.

Airflow Exercises

Without instruments, have students sit on the edge of their chairs with elbows positioned on their knees. Next, they place their chin onto their open hands and relax. Then gently inhale air until an expansion near their beltline occurs. Students usually refer to the beltline area as their "belly." Note that if students are not feeling expansion in this area, they are not inhaling enough air. Afterward, students exhale steadily with a hiss, working to keep the hiss sound as steady as possible. Another way to visualize and experience a steady exhale is to imagine bending a candle flame without blowing it out. Students can also experience the sensation of deep, relaxed inhalation and exhalation by carefully observing their breathing as they begin to sleep by placing

their hands onto their stomachs while lying on their backs. During sleep, our bodies resort to this natural, relaxed, deep breathing. They can journal their own results of this exercise and share with classmates.

The next step is to incorporate this kind of inhalation and exhalation when sitting in their chairs. Give students time to listen closely to the differences in tone that are produced with and without relaxed, deep inhalation and exhalation. Students can answer questions such as "Which sounds better?" "Which tone seems rounder?" "Which one sounds better supported?" "Which tone sounds fuller?" "What are ways that we can remember to provide this kind of airflow to produce our VBT when sitting?" Questions and answers can become part of a worksheet, journal, or portfolio.

Share Information and Resources

There are breathing devices used by respiratory therapists that can measure students' inhalation and exhalation. These items may be purchased at minimal cost at area health supply stores or from an online vendor. Incorporate these resources as needed. Seek school health professionals who may be able to assist. To incorporate an indirect teaching experience for your students, ask them to create a series of related air exercises that will lead to the same result. Students can demonstrate and lead their classmates in these exercises. Allow students to share their experiences with one another. Expect them to assist one another as well. Posters that show ways to manage the airflow needed to produce VBT can be created by students and displayed in the classroom.

Embouchure

Physically, people are not the same; therefore, expect some differences in the ways students form, develop, and use their embouchures. When you are observing students, they can be expected to seek answers to the following questions: "Does the playing position of the instrument look natural?" "Are cheeks puffed out?" "Does body posture look comfortable and free of tension?" "Do the hands fit onto the instrument comfortably?" A simple reminder that "the instrument comes to you; you don't go to it" seems to help. Have students compare their own posture to the photos in their band or ensemble method book.

Woodwind students must understand the role that embouchure plays when producing VBT. Inexpensive portable mirrors can help when corrections or suggestions need to be presented to students. When students puff out their cheeks, the teacher or another student can simply place the mirror within eye view of the player. Without saying a word, students usually correct the problem without any additional attention. As with some other aspects of teaching, sometimes the less said, the better.

It is a good idea to talk about the muscles that are associated with embouchure formation in the sense that all muscle groups in our body must be regularly strengthened and conditioned. This

information can be introduced to students by leading a discussion of activities that involve the conditioning of any muscle group. Students are usually surprised when this comparison is made: athletes build strength and endurance for an activity, and so do musicians. For embouchure strength to be developed, students should be reminded about the importance of playing their instruments daily. This is a useful way to build and ultimately maintain the embouchure strength needed to produce their VBT.

Introduce the role that the embouchure plays in tone production by having students identify activities that incorporate an understanding of a sweet spot. They will often discuss the sweet spot in conjunction with hitting a tennis ball or kicking a soccer ball. One student explained that "the sweet spot is when you kick the ball at just the right time and that it doesn't feel funny but really good. It's easy!" Transferring over to wind instruments, the sweet spot is the precise placement of the embouchure onto the mouthpiece, double reed, or head joint with which one produces VBT that seems (and sounds) effortless.

Embouchure Exercises Finding the Sweet Spot for Single-Reed Students

Students set their embouchures with the top row of teeth positioned on the mouthpiece while covering the lower teeth with the bottom lip. Then, they move three-fourths of the mouthpiece into the mouth, reset the embouchure, and blow. Make sure students locate the spot on the mouthpiece that represents three-quarters of it. Once a steady tone is maintained, students slowly move the mouthpiece outward, carefully listening and remembering the changes in their tone. After a few tries, they will most likely determine that a harsh squawky tone occurs when too much of the mouthpiece is used. A soft, weak tone is produced when only the tip of the mouthpiece is covered. Students can be expected to listen carefully to their sound until they have found the sweet spot. In small, homogenous groups, have students demonstrate the sweet spot to their classmates. Members of the group can be expected to listen closely to one another to see if each student has found the sweet spot. Ways to remember where the sweet spot is can be discussed orally as well as recorded in a journal or portfolio.

Finding the Sweet Spot for Double-Reed Students

Once the reed has been soaked in water and is placed on the instrument, double-reed students complete the exercise in the same way as single-reed students except that they will use a double embouchure: both upper and lower rows of teeth are to be covered by the upper and lower lips, respectively. To begin, have students set the reed onto the embouchure, up to the thread for oboists and first wire for bassoonists. Then, students blow air until a sound is produced. They continue sustaining this sound while slowly moving the instrument outward, carefully listening and remembering the changes in tone quality that ensue. Usually, the more reed held in the embouchure, the harsher the tone and sharper the pitch; less reed produces a thinner, quieter sound and flatter pitch. Students can be expected to listen carefully to their sound until they have found the sweet spot.

When there is more than one double-reed student, students can work together in much the same way as the single-reed students. If there are no other double-reed students, integrate this student into a group of single-reed students, making sure that single-reed students are aware that the sound produced by the double reed will be different yet the overall effect in sound will be the same. Members of the group can be expected to listen closely to one another to see if each student has found the sweet spot. Ways to remember where the sweet spot is can be discussed orally as well as recorded in a journal or portfolio.

Locating the Sweet Spot for Flute Students

For flute students, being able to blow air steadily in several different directions is an important first step. Flute students begin by putting their open, "strong" or dominant hand a few inches in front of their embouchure. To help them form the embouchure, have students complete the name of the childhood character "Winnie the Pooh." Then, they blow air steadily until they can feel the air striking the palm of their dominant hand. Next, they slowly move the open hand above and below the embouchure. Expect students to be able to blow steady air onto their dominant hand. Flute students will need to change the direction of their air. They can usually figure out how to move the air in different directions without much help from the teacher. Suggestions might include blowing a bee off the nose or blowing a butterfly off the chin. Once they are successful, have students set their embouchures onto the lip plate of the head joint, covering the open tube with their right hand. Students then blow directional air gradually downward until a tone is produced on the mouthpiece.

When placed in homogenous groups, students can compare how they manipulated their airflow. Students who are successful with this exercise can easily assist others. In small, homogenous groups, have students demonstrate the sweet spot to their classmates. Members of the group can be expected to listen closely to one another to see if each student has found the sweet spot. Ways to remember where the sweet spot is can be discussed orally as well as recorded in a journal or portfolio.

As an additional challenge, flute students can develop the ability to produce consistent tone by placing the head joint on their laps with their eyes closed, then picking it up and setting it onto their embouchure, and blowing and seeing if they can produce tone instantly. This will take some practice. Congratulate flute students when they can produce tone three or more times in a row successfully, and continue to encourage those who are not yet successful.

Conclude all exercises by allowing students to describe what their VBT sounds like as well as what it feels like. By listening, analyzing, and evaluating their tone production, aural skills can be enhanced. Students usually say it best: "When I place too much mouthpiece inside my mouth and blow, it sounds harsh and squawky," and "When I blow directional air toward the tip of my nose, my flute doesn't even make a sound. That's not good!"

As is so often the case when working with students, the more the teacher can demonstrate these activities successfully, the greater the likelihood that students will benefit from point-specific feedback. Successful students can assist their sections in these exercises. These leaders can also be expected to provide feedback and encouragement to their classmates. Once VBT is produced, insist that it be used at all times.

Tuning

By the time students enter our instrumental classrooms, they are probably able to hear differences in pitch.[2] Beginning instrumentalists can be taught how to match pitch by starting with the fundamental tones that are produced with just the bassoon reed and bocal, clarinet mouthpiece and barrel, flute head joint, oboe reed, and saxophone mouthpiece and neck. Once fundamental pitches are produced and stabilized with reed, air, and embouchure support, students can be expected to match fundamental pitches accurately and consistently. Students can then transfer these skills to developing their own pitch-matching accuracy with their fully assembled instruments.

Students who experience difficulty matching fundamental pitches will often develop intonation problems when playing their assembled instruments. Therefore, extra time must be provided to assist students in developing their ability to be successful matching the fundamental pitches located in Table 1.

Tuning Exercise 1

Have students experiment with the tightening and loosening of their embouchures as well as manipulating their airflow. Ensure that students seek answers to the following questions: "Does the pitch change when the embouchure is tight?" "Loose?" "If so, how?" "Does the pitch change when airspeed changes?" "If so, how?" Students must be allowed time to experiment with their sound in order to answer these questions. Placed in small, homogenous groups, students can seek answers to these questions themselves without much assistance from the teacher. Provide a worksheet for students to complete. Allow time for students to share their experiences with one another. Expect them to assist one another as well.

Tuning Exercise 2a

When matching a tuning pitch, modeling is important. Select a student who is able to play a pitch steadily to assist the teacher in demonstrating how to tune. If possible, bring a few high school instrumentalists to your class who can successfully demonstrate and teach this skill to your students. To begin, Student A plays a given pitch for four counts, followed by the teacher (or Student B), who plays the same pitch for four counts. Have students close their eyes and listen again. Both the student and teacher play the same pitches, this time together for four counts. Have students answer the following questions: "How many different sounds did you hear?" "How many different instruments did you hear?" "How could you tell?" "Did the instruments play the same pitch?" "Different pitches?" "How could you tell?"

Continue the exercise playing the pitches together but this time the teacher (or Student B) alters his or her pitch so that the two pitches do not match. "Were our pitches the same?" "Different?" "How could you tell?" Once students can determine that the two pitches played together this time sounded different, follow up with questions such as "Which one of us sounded higher?" "Lower?" "How can we adjust our pitches when we want both instruments to sound as one?" With repeated experiences, students should be expected to develop a level of success with this listening exercise. Then, they can be expected to repair intonation problems on their own. The key is to make sure that students can hear same or different pitches. The more aware that they can be when listening to one another, the more successful students will be in identifying and fixing intonation problems. Listening skills will be enhanced as well.

Tuning Exercise 2b

For an indirect teaching experience, pairs of students can sustain the same pitch on their instruments while other students listen to determine if the two sounds are the same or different. Students who are successful matching one another's pitch can be encouraged to assist others by answering questions and providing encouragement to their peers. Have students reflect on this particular kind of hearing in their journals, portfolios, or a worksheet.

Reeds and Mouthpieces

Stick with a brand of reed whose overall tone is satisfying to you and your students. Make sure that you and your students take time to try several different brands of reeds first. Softer reeds require less embouchure strength and less air support. Because less embouchure strength and air are needed, VBT suffers. Traditionally, a rich, dark sound is preferred when playing reed instruments. Reedy, thin, or nasal-sounding woodwind tone is less desirable. A medium-hard reed, well-conditioned embouchure, and plenty of airflow will lead to VBT. For students to better understand this rich, dark type of tone, acquire commercially available recordings by the following artists: bassoon, Kim Walker; clarinet, Karl Leister; flute, Emmanuel Pahud; oboe, Alex Klein; and saxophone, Kenneth Tse. See Figure 1 for an expanded list of suggested artists and recordings.

Incorporate brief listening experiences for your students that involve these recordings. When encouraged, students will be able to describe what they hear. Guided questions pertaining to the sound that these artists produce on their instruments can be a great way to get students interested in their own sound. Have students answer the following questions: "What words can you use to describe the quality of the artist's tone?" "What aspects of VBT do you notice with the recording?" "Is the sound full?" An extension listening activity would be to present two different recordings of the same piece of music. Students could then be expected to compare and contrast both recordings. For example, incorporating a recording of Haydn's Oboe Concerto performed by an American oboist, such as Alex Klein, and a British oboist, such as Sarah Francis, will surely provide students with enough contrast in tone to warrant further discussion.

Encourage students to learn more about professional musicians who play their instruments. These artists and many others are mentioned on Web sites managed by themselves, the recording company that produces their work, and national or international organizations for each woodwind instrument. Links to these organizations appear in Figure 2. Encourage your students to explore these Web sites.

Publications such as *The Instrumentalist* periodically include information about leading artists and teachers as well. Because students are typically fans of entertainers and athletes, music educators should encourage students to learn more about woodwind "stars" as well as the many first-rate ensembles that feature these professionals. Integrate writing experiences by having students present short reports about these artists and any others that they discover in the process. As both a way to connect with the community beyond the school and an activity for Music In Our Schools Month (MIOSM), encourage students to arrange meetings with area woodwind professionals to seek answers to questions about the core aspects of playing their instruments. Students can be expected to share the results of their projects either in class, in journals, in portfolios, or by creating posters to display in the classroom. This activity can easily be expanded for brass, percussion, and string players.

Reed Selection

Reed selection, care, and maintenance invariably throw an additional burden onto instrumentalists, their parents, and teachers. Reeds play as much of a role in good tone production as do air and embouchure stability. Typically, single- and double-reed students play on soft, worn reeds, because it is simply easier. All reeds have a life cycle. New reeds are rarely flexible to use straight out of the package. Students should rank order their new reeds by incorporating their listening skills as they evaluate how each reed sounds on their instrument.

A breaking-in process should be completed by playing each reed for a few minutes daily, keeping track of how the reeds change over time by answering questions such as "Do they get better?" "Worse?" "Harder?" "Softer?" Reminding students that reeds require a break-in period is a great way to encourage them to be more attentive regarding the care and maintenance of them. Make sure that reed students are "four deep" with reeds, which means that they have four playable reeds with them at all times. Teachers can review this expectation with parents while making sure to have resources available where reeds can be purchased.

Students should know what constitutes a good, broken-in reed. A good reed allows the player the capability to play all registers in all dynamic ranges and articulations both freely and easily with VBT. Before reeds are used, they should be soaked in water rather than saliva. Students should be allowed time to do this in class. After reeds have been used, they should be carefully removed from the instrument first, gently patted dry, and stored in a non-airtight container. Mold can grow on reeds when they are stored before they are dry. In addition, students can keep the results of

their reed experiences in a journal, notebook, or portfolio.

Mouthpieces

Typically, new woodwind instruments are equipped with a stock mouthpiece. Parents can be a bit surprised when they are told that they will need to purchase an additional mouthpiece for class. Always begin by seeking a middle-of-the-road mouthpiece for beginners and intermediate players. Make sure that all clarinet and saxophone students use the same brand mouthpiece. This will help to establish consistent tone within each section of the ensemble.

Once students become more proficient on their instruments, consulting with an area woodwind specialist can help them to discover the varieties of mouthpieces and features of each. Again, seek a mouthpiece that is considered "middle of the road" in the facing, tip opening, tone chamber, and so on. Avoid mouthpieces that are scratched or chipped.

Fingerings

There are essentially four kinds of fingerings that instrumentalists use: regular, sometimes called authentic or long; alternate, sometimes called short or chromatic; trill, sometimes referred to as shake; and harmonic. Students should learn how each of these sets of fingerings functions.

Regular fingerings are standard because they produce the most stable pitch and desirable tone. Alternate fingerings are used when the player encounters difficult technical passages. Alternate fingerings also enhance the response of certain pitches, such as the quiet low F-sharp fingering for the bassoon. Trill fingerings are used when two consecutive pitches are to be performed rapidly in succession. More out of carelessness and lack of knowledge, students will choose to use regular fingerings rather than trill fingerings. When students become frustrated with this aspect of their instruments, they may simply avoid playing the trilled pitches altogether. Harmonic fingerings allow the player to produce what is sometimes referred to as an "artificial" sound other than the fundamental tone. A complete and accurate set of woodwind fingerings (including trill and harmonic) can be found in Frederick Westphal's *Guide to Teaching Woodwinds*.^[3] Web sites devoted to the intricacies of woodwind fingerings are quite plentiful. Music merchants also provide a variety of fingering charts and additional resources.

It is also not unusual to hear students ask, "How do I finger a D-sharp?" While it may be more time efficient in direct teaching to simply show or tell the student what the proper fingering is, student musicians will be better served when they are also provided with some indirect teaching experiences that will lead to an understanding of fingering patterns and how those patterns function on their instrument. Ask, "Can you show me the fingering for the pitch that is a half step below D-sharp?" Follow that by asking, "Now, what additional key(s) do you suppose that you will need to use in order to finger a D-sharp correctly?" When fingering questions arise, guiding students through a series of exploratory questions will allow them to gain a better understanding of

how key mechanisms function on their instruments. Ensure that students come to class with their ensemble method books. These books should be kept close by during the lesson or rehearsal so that students may be able to locate fingerings there.

When alternate fingerings are presented in band or ensemble method books, avoid overlooking these sections. When students are unsure about how or when to use alternate fingerings, simply allow students to discover the answers themselves. During class, provide an indirect teaching experience by allowing students to show and tell their solutions to the class. This works best when students are placed in small, homogenous groups or within their particular section, such as low reeds. Band method books usually provide accurate explanations and exercises that will help students learn this important aspect of playing their instruments.

The consequences of using incorrect fingerings may be serious when students have to learn correct fingerings later. Bad playing habits are difficult to change. In some instances, even more may be at stake. During solo and small-ensemble adjudication, an evaluator may base his or her opinion of a student's achievement level on the fingering choices that the student uses during a performance. Therefore, it is important for instrumentalists to have a thorough understanding of the different kinds of fingerings.

To ensure that students make good fingering choices, incorporate the use of blank fingering templates in class. A short quiz may consist of completing such worksheets. This is also a reliable way to measure how well students are managing this particular aspect of woodwind playing. In a heterogeneous setting, clarinet students can take a few minutes to complete a worksheet involving the use of a series of alternate fingerings, such as the chromatic F-sharp and the low B-flat, while the teacher works with flute students and vice versa.

When you are leading the ensemble, it also may help to systematize the way woodwind fingerings are presented to the class. All woodwind instruments operate with the left thumb, left three fingers, left pinky finger, right thumb, right three fingers, and right pinky finger. For example, when students are playing the fourth-line D in treble clef (or third-line D in bass clef), fingerings can be explained in the following manner: bassoons, left thumb, 1-2; clarinets, left thumb with register key, 1-2-3, 1-2-3; flutes, left thumb, 2-3, 1-2-3; oboes, half-hole, 2-3, 1-2-3; and saxophones, left thumb, 1-2-3, 1-2-3; and so on. Once a system for communicating fingerings has been taught, communicating those fingerings from student to student, from teacher to student, or from student to parent may occur with less confusion or wasted instructional time. Students can be expected to orally dictate fingerings when asked.

To incorporate another indirect teaching strategy in class, place students in small groups and begin a ten-minute "brainstorming session" by asking students to share with one another the ways that they learn, keep track of, and recall fingerings on their instruments. Let each group choose a

scribe with legible handwriting to record all the main points that are shared. After ten minutes, have each scribe present his or her group's findings to the class. The teacher can write each strategy on the board. Allow students to try these different strategies in class and when practicing at home. In a subsequent extension activity, students can demonstrate which strategy works for them. Students also can record their experiences in a journal or portfolio.

Teacher = Facilitator

While most day-to-day instruction in schools incorporates direct teaching strategies, it is when students are also provided with indirect teaching, student-centered experiences that they can begin to better manage aspects of airflow, tone, embouchure, intonation, reeds, and fingerings on their own. Indirect teaching allows the teacher to move into the role of facilitator, that is, a guide to learning, as opposed to the sole source of knowledge that is implied in direct teaching.

Let's face it: students expect to learn something when they enter our classrooms. Fortunately, the music classroom is multidimensional. Whether learning about aspects of melody, harmony, rhythm, form, dynamics, or articulation and so forth, student instrumentalists have a great deal more to learn about the intricacies of playing their own instruments. From current "stars" who play their instruments to the details of reed making and adjusting, the content available for music educators can be overwhelming. It is my hope that by incorporating some of the classroom-tested exercises mentioned here, students will leave class having learned more about specific aspects of playing their woodwind instruments. Once they are made aware of these details, allowed to experience the sweet spot, for example, and expected to master these core aspects, students will be more successful learners. They will leave class having learned something more about playing their instruments, rather than simply having been told to "go practice." With success in hand, they will enjoy making music even more.

Techniques for creating good tone on various woodwinds can make teaching beginning band and orchestra musicians easier for all involved.

NOTES

1 Kenneth D Moore, Effective Instructional Strategies: From Theory to Practice (Thousand Oaks, CA: Sage, 2009)

2 Patricia Shehan Campbell and Carol Scott Kassner, Music in Childhood (New York: Schirmer, 2009)

3 Frederick Westphal, Guide to Teaching Woodwinds (Dubuque, IA: Wm C Brown, 1990)

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FIGURE 1 Discography of Works by Woodwind Recording Artists Bassoon

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Clarinet

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- Meyer, Sabine. *A Night at the Opera* (CD 724355613721). London: EMI Classics, 1998.
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Flute

- Grafenauer, Irena. Mozart, Mercadante, C. Stamitz: Flute Concerto (CD 4263182 PH). New York: Philips, 1991.
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FIGURE 2 Web Sites of National and International Woodwind Organizations Bassoon

International Double Reed Society, <http://www.idrs.org>

Clarinet

International Clarinet Association, <http://www.clarinet.org/home.asp>

Flute

National Flute Association, <http://www.nfaonline.org/>

Oboe

International Double Reed Society, <http://www.idrs.org>

Saxophone

International Saxophone, <http://www.saxophone.org>

TABLE 1: Fundamental Pitches for Woodwind Instruments

Legend for Chart:

A – Instrument and Measure

B – Pitch

A

B

Bassoon reed and bocal

Measure 1

Crowed pitch produced when lips are placed up to the first reed wire and warm air is blown with a "hu" sound as in the word hum

Measure 2

Pitch produced with standard embouchure and as cool air is blown as if blowing out a candle

Measure 3

With attached reed and bocal, fundamental pitch that is produced with embouchure set and cool air blown

Clarinet mouthpiece and barrel/Bass clarinet mouthpiece and neck

Measure 1

B-flat soprano clarinet fundamental pitch produced when embouchure is set

Measure 2

B-flat bass clarinet fundamental pitch produced when embouchure is set

Flute head joint

Measure 1

Fundamental pitch produced when embouchure is set and right side of the head joint is unstopped

Measure 2

Fundamental pitch produced when embouchure is set and the right side of the head joint is stopped with right hand

Measure 3

Harmonic pitch produced when embouchure is set and the right side of the head joint is stopped with right hand

Oboe reed

Measure 1

Crowed pitch produced when lips are placed on the reed thread and warm air is blown with a "hu" sound as in the word hum

Measure 2

Pitch produced with standard embouchure and as cool air is blown as if blowing out a candle

Alto, tenor, and baritone saxophone mouthpieces and neck

Measure 1

Alto saxophone fundamental pitch produced when embouchure is set
Measure 2

Tenor saxophone fundamental pitch produced when embouchure is set
Measure 3

Baritone saxophone fundamental pitch produced when embouchure is set

Baritone saxophone fundamental pitch produced when embouchure is set
Note: Some of these fundamental pitches also appear in H. Gene
Griswold's Teaching Woodwinds. The textbook was published in 2008 by
Pearson Prentice Hall.

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