

2018-01-01

A Survey Of Youtube Video Resources For Helping Beginner Clarinetists Cross The Register Break

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A SURVEY OF YOUTUBE VIDEO RESOURCES FOR HELPING BEGINNER
CLARINETISTS CROSS THE REGISTER BREAK

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Dedication

I would like to dedicate this work to my parents, Nancy Gibbs and Tom Herriman, my daughter Elizabeth Newberry, and my partner Michael Riley for their enthusiastic support of my decision to return to school for my graduate degree, and their constant encouragement and support throughout my years of study and through the process of researching and writing this thesis. I would also like to thank trumpet professor Nancy Taylor, who first encouraged me to apply to the University of Texas at El Paso, and in doing so began this process.

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CLARINET PLAYERS CROSS THE REGISTER BREAK

by

FLORA E. NEWBERRY, B.M.

THESIS

Presented to the Faculty of the Graduate School of
The University of Texas at El Paso
in Partial Fulfillment
of the Requirements
for the Degree of

MASTER OF MUSIC

Department of Music
THE UNIVERSITY OF TEXAS AT EL PASO
May 2018

Acknowledgements

I would first like to thank my thesis advisor Dr. Curtis Tredway, Music Education Professor at the University of Texas, El Paso. He worked tirelessly to keep me focused on my central subject, redirected me every time I began to go off on a tangent, and helped me to hone countless versions and drafts of my thesis into the finished product. I would also like to thank the members of the thesis committee who evaluated my work: Dr. David Ross, Dr. Bradley Geneviro, Dr. Lindsay Macchiarella, and Professor Kim Bauer. Their oversight and guidance was greatly appreciated.

Thank you,

Flora Newberry

Abstract

The internet is currently a much-used source of information for instruction and pedagogical information among students and teachers. The importance of the internet, specifically video instruction, in the dissemination of pedagogical information, combined with its largely unevaluated body of information, calls for serious study and consideration. It is necessary for the teaching community to understand the impact these resources have on teaching and learning, and how internet video resources can benefit teachers and students. This survey compares current video resources on YouTube for helping beginner clarinet players cross the clarinet register break, to the traditional print resources that make up the main body of pedagogical information on this subject. A comparison of the four main approaches found in the print literature with selected YouTube videos produced recommendations of videos to supplement and enhance understanding of each approach.

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Chapter 1: Introduction

Musical instruction has been an important part of the American public school curriculum for more than one hundred and fifty years. In 1836, after years of agitation on the part of music education advocates, and successful experimentation at the Boston Academy of Music, Lowell Mason presented a memorial (petition) to the Boston School Committee, to include music in the curriculum of its public schools. Mark (1982, p.134) explains: “The School committee appointed a special committee to consider the memorial. In 1837 the special committee’s report was presented to the School Committee. It was most favorable to the request of the petitioners and resulted in the adoption of vocal music in the curriculum of the Boston Schools, with Lowell Mason in charge of several music teachers.” Cincinnati also began music instruction in its public school system around the same time, influenced by Timothy Mason (Lowell’s brother), and Calvin Stowe, who had recently returned from visiting schools in Europe with his bride Harriet Beecher-Stowe (Mark and Gary, 1992 pp.150-152). By 1844, according to Horace Mann, there were in Massachusetts “about five hundred schools in the state where vocal music is now practiced” (Mann, 1844 in Mark, 1982 p.41). Between 1847 and 1857 major American cities such as Galveston, San Francisco, San Antonio, Detroit, Chicago, Memphis, Saint Louis, Terre Haute, Cleveland, and Columbus followed suit (Mark and Gary, 1992, p.153).

Instrumental music training and performance became an important part of the public school music program in the years after World War I, spurred by touring bands and orchestras, the founding of orchestras in major American cities, the development of town bands, and military bandsmen and conductors returning to civilian life. “By 1923 the band became an important force in school music” (Keene, 1982, p.291). Rationale for inclusion of instrumental music in the American school curriculum at this time centered around principles of democracy,

egalitarianism, and community building (Keene, p.288). Musical instrument companies were happy to reinforce these ideas, as mass production allowed them to flood the market with instruments, and the connection of bands with school athletic programs also fueled the growth of instrumental music. As school band programs grew in importance and popularity, the idea that instrumental music was a morally healthy pursuit that kept students out of trouble, taught them useful social skills, and raised their grades was validated by publications such as Robinson, Craft and Summers' 1954 article "Implications of the Music Program for Pupil Growth" and Ross Capshaw's 1957 survey of parents of band students in El Paso, TX. (Capshaw, 1958, 72-73).

As the field of music education grew and developed in the twentieth century, the philosophy of music education became less concerned with non-musical goals; the intrinsic value of arts education came under consideration. In the words of Bennett Reimer, a leading proponent of the aesthetic value of arts education:

“The body of the musical performer is the core, or nucleus, in which musical problems are dealt with-in which musical thinking takes place. That "thinking in sounds" is a thinking within the physicality of producing sounds, including as essential components of that physicality the feeling of the music, the feeling of the body in the act of producing the music, and all the knowings about how to do so authentically that are subsumed within the body in its musical actions.....Musical instruments provide the most extensive and intensive opportunity available to human beings to know within the body, through the body's activation of the acting, feeling, and thinking processes required to form sounds musically. In becoming "an instrument of an instrument," a person, of any age and of any level of attainment, is given the opportunity to think musically in the mode of performance-the mode of musical knowing as physical creativity. Each particular instrument is a particular "theatre of operations" for such knowing to be encountered and developed: each offers its own set of musical problems to be thought/ acted/felt according to the particularities of its physical requirements. So, in one very real sense, what pianists know, or what violinists, or singers, or clarinetists, or guitarists, or koto players know, is peculiar to their particular theatre of physical operations. In the broader sense, all manifest the common knowing of musical performing-the "knowing how" of the body when it is being musically creative.” (Reimer, 1994, p. 12)

As Reimer states, each instrument is its own “theatre of operations,” offering the opportunity for students to develop aesthetically through its specific characteristics and

uniqueness. Therefore, pedagogically, the better prepared the teacher is to work with students to overcome these challenges, the more likely that the student will have a positive aesthetic experience. In the case of the clarinet, a staple instrument of the American band since the 1890's, learning how to go smoothly over the break from the chalumeau register to the clarion register is one of these challenges. "Crossing the break" or going "over the break" often requires long term, concerted effort from both students and teachers. This challenge has been present in clarinet playing since the 18th century, when the chalumeau, with a limited one-octave range, acquired a register key and began to develop into the modern clarinet (Karp, 1986). It is made more difficult by the fact that the clarinet, because of its cylindrical bore, overblows at the interval of a 12th, while most other woodwinds overblow at the interval of an octave. Many clarinet evaluation and test pieces contain sections that specifically challenge the player's ability to play across the break. For example Thomas (2010) says of Debussy's *Premiere Rhapsodie* (written in 1910 as a competition test piece for clarinetists seeking to graduate from the Paris Conservatory), "Much of the piece requires great facility "over the break" meaning where the clarinet moves from one register to another. Fingerings in this area can be awkward" (para.8). Devices have been patented to aid the student in maintaining finger position when going over the break (Amadio, 1976), and Bordo and Combs (2008) comment that "Going over the break causes many clarinet drop-outs" (p.48). Kerstetter explains in his article:

"The difficulty of going from a note played with one or two fingers to a note played with seven fingers plus the thumb is compounded by the instrument's tendency to squeak or grunt if the player leaves a hole slightly uncovered. Without a solid technique for crossing the break, students add extraneous body movement and undue tension in the embouchure, and stop the air stream at the register change to avoid squeaks...because this divide lies right in the middle of the comfortable playing range, those without a strategy for crossing the break will quickly fall behind." (Kerstetter, 2000, p. 50-52)

Chapter 2: Statement of the Problem

The purpose of this descriptive study is to document the different video approaches currently available on YouTube for aiding students in crossing the clarinet break, and offer a recommendation of the best practice YouTube video resources for each approach, both for instrumental music teachers and their students. For those instrumental music teachers who do not play clarinet as their primary instrument, understanding the best way to introduce, teach and support over the break playing in young clarinetists can be challenging and confusing. Resources on the web, especially YouTube videos, are currently an important resource for band directors and students. For this type of kinetic challenge, information can often be communicated more quickly and effectively in video than in a print medium. Different views of the instrument can be shown that one can't see while playing, right versus wrong finger positions can be demonstrated, and the viewer can also hear sounds that indicate a problem and sounds that indicate all is well.

As communication on the internet is moving our culture away from print and again towards an oral tradition, oral communication such as that found in videos is taking a greater role in the dissemination of all types of information. As discussed in Fernback "... electronic media technology has brought humankind into the age of what Ong (1982) calls 'secondary orality.' It is a re-emergence of an oral character in communication that represents a blend of literate, oral, and...electronic cultures in contemporary discourse" (Fernback, 2003, pp.37-38). Considered from this perspective, video resources are likely to become even more important in the dissemination of pedagogical information in the future. Yet while these resources can be extremely useful, the material currently available on YouTube is unreviewed and unevaluated, and sorting these videos for quality and usefulness can be time consuming and may deter some users.

Delimitations

This study is not meant to be a comprehensive survey of over-the-break teaching techniques, and it is not the purpose of this study to recommend one particular technique over another. The purpose is rather to understand the different approaches in literature for classroom teachers and their students, and to present recommended video examples available from YouTube, for a more informed pedagogical approach to teaching over-the-break playing. The print sources reviewed in this study are literature available to and directed towards band directors, beginning instrumental class teachers, and their students. Clarinet pedagogy books that were not part of band methods or woodwind pedagogy methods were not included, nor were materials directed specifically towards private instructors or professional clarinetists. It is not the purpose of this study to recommend video materials to replace these print sources, but to recommend those that can be useful supplemental resources to complement the print literature.

Internet Citations

The internet and its numerous sites are largely unregulated, and are full of postings with errors and unconventional spelling, punctuation, capitalization, and grammar. However, citations of internet sources will be “as is,” without any corrections or modifications.

Definitions

Chalumeau- A single-reed instrument of predominantly cylindrical bore, related to the clarinet (Lawson, 2001).

Chalumeau Register- The lower register of the Clarinet, E3 to Bb 4 (Reichard, 2005).

Clarinet Break- The gap between the chalumeau and the clarion register (Kerstetter, 2000, p.50).

Clarion Register- The middle register on the Clarinet, B4 to C6 (Reichard, 2005).

Register Key- The long key right above the left thumb hole on the clarinet.

Index finger, pointer finger- The finger closest to the thumb, also known as the digitus secundus maximus.

Throat tones- the notes G4, Ab/G#4, A4 and A#/Bb4, which sit at the top of the chalumeau register.

Chapter 3: Related Literature and Research Findings

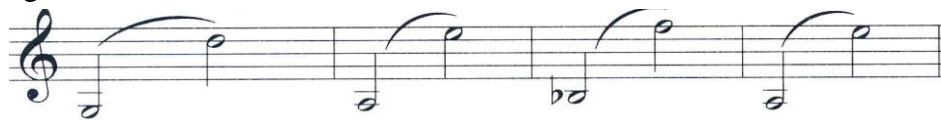
Five sources of related literature were reviewed, all of which are important for the history and background they provide for the different approaches to helping beginner clarinetists to cross the register break. The first group of sources were woodwind pedagogical texts directed at music educators and students in college and university music education programs. The second and third groups were articles from two different periodicals aimed at instrumental music teachers:

Teaching Music, and *The Instrumentalist*. The fourth group consisted of theses and dissertations related to the subject, and the fifth group was a selection of the clarinet books of band methods published between 1947 and 2009, selected based on their availability to the researcher. The chapter culminates in an analysis of the main approaches to the problem found in the print literature.

Woodwind Pedagogical Texts

Guide to Teaching Woodwinds (Westphal, 1962, 1974, 1980 and 1990) lists upward exercises in intervals of 12ths (Fig. 3.1), and keeping the right-hand fingers down on the throat tones of G4, Ab4, A4 and Bb4 (Fig. 3.2). Westphal also mentions that making sure the left thumb is moving vertically to open the register key rather than sliding is very important.

Exercises similar to the following are used in several methods books to introduce the clarion register.



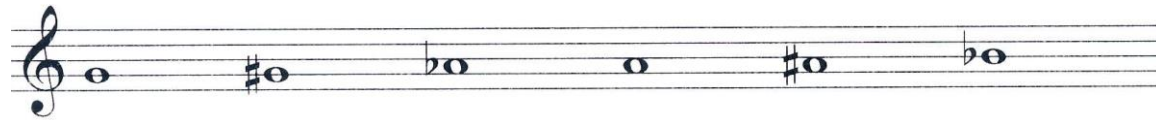
Westphal (1962), p.55

Figure 3.1

The right-hand portion of the fingering for any one of these notes:



can be kept down while playing any one of these notes:



Westphal (1962), p.55

Figure 3.2

Playing and Teaching Woodwind Instruments (Sawhill & McGarrity, 1962), never mentions the clarinet break, but says: “Clarinets have a very large range which has to be approached rather gradually” and “All woodwinds will emphasize the harmonic series appropriate to each instrument” (p.21). Immediately after these statements, several pages are presented which involve upward 12th slurs for the clarinets (p.21-25), very similar to the exercises in 12ths presented by Westphal. While these exercises are similar to the exercises offered by Westphal to help with crossing the break, in this case the break is not mentioned. Exercises which move from the throat tones to the clarion register are presented on p.26-29, again with no mention of the break.

The Woodwinds (Timm, 1964), contains a paragraph that states: “In crossing the break (going from the throat tones --G, G#, A, Bb, B in the staff-- to tones in the second or clarion register), keep the fingers of in right hand down on the rings or keys, provided pitch and tone are not impaired...This keeps the clarinet from bouncing” (p. 62).

Woodwind Class Method (Lang, 1975), notes “clarinets over the break” and “keep right hand down throughout” on exercises 38-44 (p. 27 and 28). There is no other mention of over-the-

break techniques.

Teaching Woodwinds (Kirkbride, J., Ott, H., Weiger, M. & Whittaker, C., 1998), contains an exercise in upward 12ths, and one in downward 12ths (p.123). On p.124, use of upward 12ths is discussed exercise to help the student maintain air and embouchure with no change. The technique of turning around the mouthpiece the student can blow while the teacher fingers the moving pitches “arrhythmically” between registers is also discussed, with the aim that the student will learn to keep the air stream supported and steady, and will not be able to change embouchure to “help” get the clarion register. When this is achieved, practicing downward 12ths from the clarion to the chalumeau register is recommended.

Wind Talk for Woodwinds (Ely and Van Deuren, 2009), notes the technique of leaving fingers of the right hand down when crossing the break (p.194), and recommends slightly different combinations of fingers for different notes (p. 194, p.213). A series of slurred exercises in thirds across the break is also suggested. (Fig. 3.3)

Examples of Crossing the Primary Break

Prepare the right hand by depressing the appropriate right-hand keys on the lower note of each grouping




Figure 3.3 displays four groups of musical notation, each consisting of a slur over a series of notes. Below each group is a box containing instructions for finger placement:

- Group 1: Leave 4-5-6-B Key Down (2-3 can also be left down on some Clarinets)
- Group 2: Leave 4-5-6-B Key Down (2-3 can also be left down on some Clarinets)
- Group 3: Leave 4-5-6-B Key Down (2-3 can also be left down on some Clarinets)
- Group 4: Leave 4-5-6-B Key Down (2-3 can also be left down on some Clarinets)

Ely and Van Deuren (2009)
Figure 3.3

Woodwind Methods (West, 2015), is notable in that it does not mention the clarinet break at all. West does mention “resonance fingerings” which involve keeping extra fingers down on the throat tones (p.52), but does not mention them in relation to crossing the break.

Articles from *Teaching Music*

A search of the NAFME (National Association for Music Education) publication *Teaching Music* on the Proquest database of music periodicals for “clarinet” and “break” or “clarinet” and “beginners” yielded fifteen results. Though NAFME publishes six different periodicals, including the *Music Educator’s Journal* and the *Journal of Research in Music Education*, *Teaching Music* is specifically aimed at providing classroom teachers a forum for the exchange of practical ideas, and for this reason it was the publication relevant to this survey. Of the fifteen titles produced by the search, two were relevant, because they discuss approaches to teaching over-the-break playing. The others dealt with subjects such as equipment, rehearsal techniques, fundamental issues not related to the break, members of the Music Industry Conference, and healthy musicianship.

“Clarinets: Over the Break vs. Over the Brink” (Lehr, 2000) recommends having students play down through the low chalumeau register to check that they are covering all holes properly.

She then recommends an exercise called the “assisted register pop-up:”

“Stand in front of the student. Have him or her play low G. As soon as a good, solid sound is produced on G (not before), reach the instrument and press the register key. If the sound pops up to D, the student is ready to try it alone. If it doesn't, the student needs to work on a firmer embouchure, more careful finger positioning, or correct reed selection.” (para.6)

She then suggests the “do it yourself register pop-up”, where the student works the register key themselves, and adds:

“Students may uncover the thumb hole as they try to press the register key. This is a common problem. Make sure that the thumb is at an angle on the thumb-hole, not straight up and down. Students must also realize that they should roll the thumb to include the register key, not take it off the clarinet to press the register key of course, the thumb must simultaneously cover the tone hole and press the register key. At this point, a visual demonstration for students is very helpful.” (para. 7)

She then recommends slurs in 12ths, G3-D5, A3-E5 etc., and recommends introducing the “right-hand down” technique as the students move into applying what they have learned to musical examples:

“At this point in their clarinet study, students will also benefit from understanding the “right-hand down” technique. This involves holding the right-hand fingers down while preparing to play upper-register notes. Because students are trying to perfect finger placement in the upper register, it is a technique that can prove useful. A clarinetist can have the right hand down on any note from the second-line G up to the third-line B-flat, and it affects the intonation of those notes very little. Why is this important to know? Musicians playing the concert B-flat scale, for example, will start on C, and then play D, E, and F. At the G, they can put the right hand down, continue to A, and then have only five fingers to place for the B when going over the break, instead of all ten fingers at once. Fewer fingers changing per note results in fewer mistakes and greater ease in the transition. This technique is especially helpful when trying to go back and forth quickly between registers.” (para. 10)

In “Workshop: Brass and Woodwinds-How Clarinetists Can Bust Through the Break” (Criswell, 2009), shares advice from clarinet teacher Linda Lewis, clarinetist and instrumental music teacher from the Southern York County School District in Pennsylvania:

“Do you want to see something cool?” she asks, and then proceeds to show how the slightest flick of the register key opens up an entirely different universe of notes. Prior to this introduction, she makes certain that the student can produce a solid tone on the low notes and is using the appropriate hand position, with fingers completely covering the tone holes.” (para. 2)

It is not clear if Lewis demonstrates this playing her own clarinet, or on the student’s clarinet while it is being played. Criswell also recommends starting with clarion E5 or F5, rather than B4 or C5 to introduce the clarion register, as these notes are easier to produce, then working down.

He further stresses the importance of correct mouthpiece and reed, as well as the instrument being in good working order.

Articles from *The Instrumentalist Magazine*

A search for articles related to the topic of teaching over-the-break playing to beginning clarinetists in available issues of *Instrumentalist* magazine between the years of 1947 and 2015 was made. For this search three different tools were used: the publication's 1976 *Woodwind Anthology* of woodwind articles published between 1947 and 1976, the 1983 *Woodwind Anthology* of woodwind articles published between 1953 and 1983, and their annual index for articles published between 1983 and 2015. This search yielded nine articles related to teaching beginning clarinetists to cross the break.

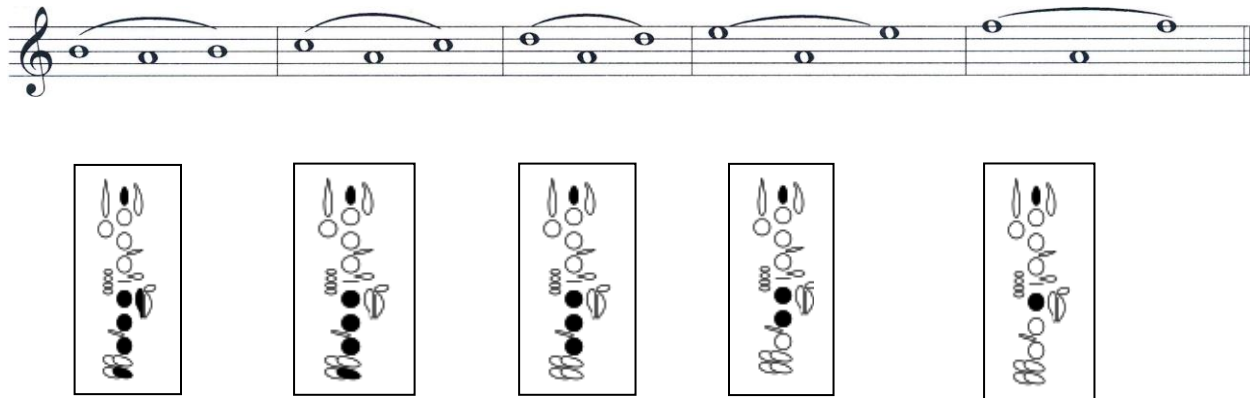
"Teaching Techniques Used for the Clarinet" (Foss and Waln, 1953) includes the results of a survey question which asks teachers how high in the clarion register they have students go on the first lesson in crossing the break, but does not provide any recommended techniques or exercises.

"Clarinet Teaching Tips for Better Fundamentals" (Waln, 1956), recommends holding the right hand fingers down on the throat tones "just prior to making the "break"" (p.645).

"Crossing the Clarinet Break" (Abramson, 1974), discusses hand position, thumb position, and finger distance, offering exercises for "the student who has difficulty in achieving the proper rolling motion of the left hand first finger and thumb when slurring across the break" (p. 832). He also recommends keeping the right hand fingers down as much as possible on the throat tones to avoid excessive finger movement, adding that "In crossing the break, only those

right hand fingers that will be used on the adjacent middle register note should be used on the throat register,” (p. 833) and offering a graphic to illustrate (Fig. 3.4).

Ex. 12. Right Hand Position of throat tones



Abramson (1983), p.833

Figure 3.4

Abramson also recommends practicing slurs across the break both with and without the extra right hand fingers on the throat tones, to practice the left hand movements alone and to feel the difference between the two methods.

“Over the Break” (Pierce, 1984), recommends checking to reinforce the lower register and clarion register fingering for G, A, and B, then recommends practicing slurring downward over the break. Pierce comments: “Do not leave any fingers down (it’s not that way in most real life playing situations.)” (p.11)

“Calisthenics for Clarinetists” (Eisler, 1984), recommends, under the sub-heading “Connecting Registers”:

“Watch for students who stop the air moving into the mouthpiece with the jaw, make the fingering change, and then release the jaw. This bad habit is often perfected to the point that the student is unaware of it.” (p.62)

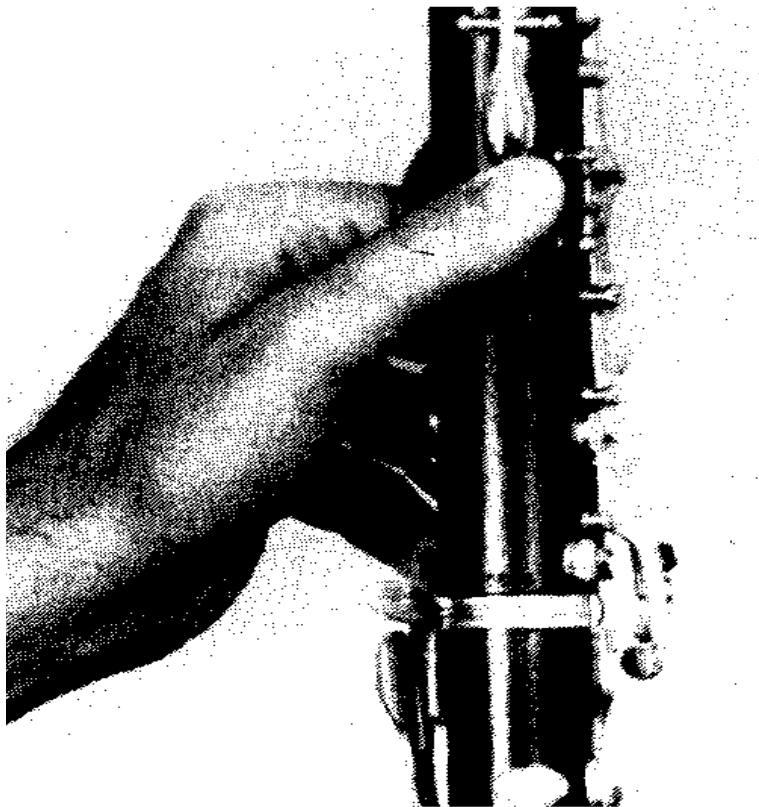
Eisler also adds:

“Another common misconception is that more embouchure or breath support is needed to make the upper notes respond. Correct this by beginning on the higher note and slurring down without changing the embouchure or breath support.” (p.62)

He gives an exercise that slurs down from C5 to G4, the C#5 to G4, then D5 to G4, and recommends doing the same exercise starting on D5, B4, and C#5. Eisler then focuses on fingering issues related to the break: rolling the first finger smoothly from the F3 hole, simultaneously depressing the A key with the side of the first knuckle. He notes that this motion can pull the second and third fingers of the left hand out of position, and gives a further page of exercises to help combat these problems. Directions are provided to the teacher such as “Watch for students who use an arm motion for this combination, or who collapse the left hand and let the first finger rest against the clarinet. Solve both of these problems by lightly grasping the student’s left wrist and holding it steady during the exercise” (p.64). He focuses next on the left thumb: “To play Bb4, lift the thumb off the thumb ring while at the same time depressing the register key. The most common error....is to pick up the thumb before depressing the register key” (p. 64). He also states: “The left thumb should be at a 45 degree angle to the clarinet, overlapping the hole enough so that its tip can also depress the register key” (P.62), and offers a photograph to illustrate this point (Fig. 3.5). Eisler also focuses on the motion of the left index finger:

“It should roll from the F3 hole, simultaneously depressing the A key with the side of the first knuckle. Often students attempt to awkwardly slide on the key, or pick up the finger and place it on the key, which gives an in-between note. The correct motion is to roll the first finger. This motion can pull the second and third fingers of the left hand out of position. Sometimes these fingers are brought to rest on top of the first finger as it presses the key. When these fingers need to cover the holes, they are hopelessly out of position. Have the student slur the combination F#4 to A4 resting the left-hand little finger on the E/B key. This holds the left hand in the proper position.” (p.62)

He recommends working with the motion of the left index finger on the G#/Ab key, making sure it is pressed with the left hand index finger between the second and third joints, rotating the wrist slightly to accomplish this, and gives exercises to practice all three types of motion: the left thumb moving on and off the register key, and the left index finger on the A key and G#/Ab key. Only after this finger work is completed does he recommend moving to exercises crossing from the throat tones to the clarion register. At this point he also recommends keeping “the right-hand fingers, including the F/C key depressed at all times.” (p.64)



Eisler (1984), p.62
Figure 3.5

““Methods” for Succeeding on the Clarinet” (Warnick, 1985), criticizes methods that introduce crossing the break too early. There is no other information offered related to over-the-break playing.

“Clarinet Reeds, Breaks, and Wisdom from Waln” (Bordo, 1995), though it quotes Abramson (1974), and mentions Waln in its title, does not address over-the-break techniques discussed by either author. The quote from Abramson is very general:

“Learning to slur across the break smoothly depends on the development of correct embouchure, breath support, hand position, and finger movement from the beginning of the clarinetist’s experience.” (p.40)

No mention is made of Abramson's or Waln’s recommendations on leaving the fingers of the right hand down for the throat tones, or Abramson's recommendations and exercises for the thumb and index finger.

Kerstetter, however, in “Crossing the Break” (Kerstetter, 2000), has quite a bit more information to offer. He recommends adding the right hand on the throat tones, and having students try playing throat tone notes both with and without the extra fingers, so they can feel the difference, adding: “If a tone hole is not completely closed, the instrument will squeak even though the embouchure, reed and instrument are fine” (p.50). He recommends practicing first going from the clarion register down to the throat tones, then from the throat tones up to the clarion register using the added right hand fingers. Kerstetter also recommends an exercise which moves between F#4 and A4 to practice rotating the left index finger from the G# or A key to the first ring, then when this motion is smooth, slurring from C5 down to A4, then C5 to G#4 and C5 to Bb4.

“First Lessons on the Clarinet” (Bordo and Combs, 2008), though rather brief (much like Bordo’s 1995 article), does offer one exercise, stating:

“Although most beginners will not play over the break in the first year, there are ways for directors to prepare them for this difficult technique. One exercise that works well is to have students slur down to E3, then hit the register key to go up to B4; students are capable of this within 5 months. Once students have practiced that...repeatedly, going over the break will seem easy.” (p.48)

Following these directions creates an upward slur at the interval of a 12th.

Theses and Dissertations

For related theses and dissertations, a search of terms “clarinet” and “break” or “clarinet” and “beginners” in the Proquest dissertations and theses database yielded 261 results. Of these, only three are relevant to this study. Forvilly (1957), and Tavarez (2005) discuss techniques for teaching over-the-break playing, but neither consider internet resources. Woolery (2011) is directed toward solving problems of high school players, but provides a useful listing of techniques to help those that are still struggling with the break. Woolery also provides a resource list for teachers, which does include some internet resources, but does not address the YouTube video resources surveyed in this paper. The other articles focus on subjects such as literature, equipment, other technical issues, bass or Eb clarinet, clarinet history, instructional approaches, and evaluation of performance.

Tavarez (2005) discusses recommendations by several different experts who have written material for clarinet teachers and students, including Hovey, Thurston, Moore and Waln. Several techniques are discussed for the teaching of over-the-break playing, beginning with rising 12ths between the low chalumeau register and the clarion register (p. 23 and p.26), and leaving the fingers of the right hand down for throat tones when crossing the break (p.27). She also discusses a technique where the teacher sits facing the student, but turns the keywork around so that the teacher can control fingering and register key, then asks the student to blow steadily while the teacher controls when to make the register change (p.23), much like the technique

discussed in Kirkbride et. al (1998). After this she explains a technique in which the student plays an F scale down from F4 to E3, at which point the teacher touches the register key to end the pattern in the clarion register (p. 25), much like the “assisted register pop-up” discussed in Lehr (2000). Later the student does the same exercise controlling the register key themselves. Finally, she discusses an exercise involving moving the right index finger on and off the A key while fingering a E3, and fingering from B4 to throat tone A4, extending gradually down to F4 and up to C5, checking finger position throughout.

Woolery (2011) suggests “popping the register key” (pp.65-66) to help students learn to keep air, embouchure, and support the same as they cross registers, and exercises involving rising 12ths from chalumeau to clarion register-G3-D5, F3- C5, E3-B4, then G3-D5, A3-E5, Bb3-F5, C4-G5, D4-A5, E4-B5 and F4-C6. She mentions index finger position (p.67), recommends having student finger A4 to B4 with eyes closed to check finger position (p.69), and also mentions the “right-hand- down” technique (p.70).

Forvilly (1957) discusses techniques for helping the student with over-the-break playing (p.84) in her thesis. She recommends slurred 12ths from chalumeau to clarion register starting with A3-E5, moving down through G3-D5 and progressing down to E3-B4, keeping the fingers of the right hand down on the throat tones, and then recommends slurring in descending motion from the clarion register over the break, using the notes C5, B4 and A4.

Band Method Books

Belwin Elementary Band Method: Clarinet book 1 (Weber, 1945) includes seven exercises involving upward 12ths from the low register to the clarion register, Exercises 100-117 of 221 exercises in the book (p. 18) There are also seven exercises which go between the throat

tones and the clarion register, which direct the student to leave right hand fingers down on the throat tones, Exercises 125-130 of 221 (p.19).

Belwin Band Builder (Douglas, 1953), has one exercise on upward 12ths from the chalumeau to the clarion register, Exercise 98 of 168 (p.16), and three exercises that involve going between the throat tones and the clarion register, Exercise 126-129 of 168 (p.19), with instructions to leave right hand fingers down on G4 and A4.

Master Method for Band (Peters, 1958), introduces *downward* 12ths in Lesson 9, Exercises 61-63 of 155, from the clarion to the chalumeau register, with the directions “review this page of slurs every day for one month” (p.13). Of the band methods reviewed, it was the only one to use downward rather than upward 12ths.

Band Method: Clarinet book 1 (Sueta, 1974), recommends right hand down fingerings in Exercise 5, Lesson 24, 206 of 216 exercises in the book. The directions say “Right hand down through entire song,” and the song includes the throat tones G and A (p.26).

Beacon Band Method (Bennet, 1975), includes seven exercises in 12ths, Exercises 47-53 of 77 in the book, in a chapter called “Notes in the Upper Register” (p.22). There is also a chapter called “Crossing Registers and the “Break””, which includes exercises that cross the break between the throat tones and the clarion register, Exercises 57-61 of 77 in the book. The directions for the first of these say “This song will include involved fingering. Do not be discouraged” (p.23). No specific exercises are offered to aid with crossing the break.

Best in Class (Pearson, 1982), includes exercises in 12ths, Exercises 93-95 of 149 (p.21), plus an unnumbered exercise entitled “something special for clarinets” that occurs between Exercise 104 and 105 (p.22).

Main Approaches in the Print Literature

An analysis of the information presented in these sources shows four main approaches to the problem of helping beginner clarinetists to cross the register break:

Approach I encountered in eighteen sources, is the technique of leaving some fingers of the right hand down when passing from the chalumeau register to the throat tones.

Approach II encountered in thirteen sources, consists of slurred exercises in 12ths upward from the chalumeau register to the clarion register or downward from the clarion register notes to the chalumeau register notes.

Approach III found in six sources, focuses on ensuring that the thumb and index finger of the left hand are positioned properly and moving correctly.

Approach IV found in five sources, involves additional techniques for teaching the student to keep air, embouchure and support the same when crossing into the clarion register, and is often found in connection with the second approach. Table 3.1 displays this information.

Table 3.1-Main Approaches found in Print Sources

Source	Approach I	Approach II	Approach III	Approach IV
Westphal	X	X	X	
Sawhill&McGarritty				
Timm	X			
Lang	X			
Kirkbride et. al		X		X
Ely&VanDeuren	X			
West				
Lehr	X		X	X
Criswell				X
Foss&Waln				
Waln	X			
Abramson	X		X	
Pierce				
Eisler	X		X	
Warnick				
Bordo				
Kerstetter	X		X	
Bordo&Combs		X		
Tavarez	X	X	X	X
Forvilly	X	X		
Woolery	X	X		X
Belwin Band Method	X	X		
Belwin Band Builder	X	X		
Master Method for Band		X		
Ed Sueta Band Method	X			
Beacon Band Method		X		
Best in Class	X			
Belwin 21st C. Band Method		X		
Essential Elements	X	X		
Measures of Success	X	X		

Chapter 4: Methodology

The YouTube platform was chosen as the source of the video examples in this study because it is the most widely used video sharing platform on the internet. According to Fitzpatrick (2010), YouTube has been a part of the internet landscape since it was first launched in 2005, and as of 2010 was the world's third most visited website (after Google and Facebook). Only one year after its launching it had over 700 million views per week, and was bought by Google for 1.65 billion dollars. Fitzpatrick adds: "Today more video is uploaded to YouTube in 60 days than all three U.S. television networks have created in 60 years" (para. 2) Because it is the best known and most widely used video sharing website, many music teachers consult YouTube for information about performance, literature, and pedagogy.

The process of searching YouTube for videos relevant to this study presented some unexpected challenges. The biggest challenge was the amount of thoroughly irrelevant material brought up by searching. Unlike most scholarly websites, YouTube's search function does not offer options to refine or narrow the search. For instance, a search under the terms "clarinet break" netted 88,200 videos, the vast majority of which had nothing to do with teaching students to get over the clarinet break. The term "clarinet register break" narrowed the field considerably, netting 732 videos, of which twenty-eight were relevant to this survey. An additional challenge was that the number changed slightly day to day, as videos were added or deleted. For this reason a cutoff date of April 5, 2018 was determined, beyond which no new material was added. The videos not relevant to this survey were duplicates, examples of music with over-the-break passages, aimed at more advanced students, or only referred minimally to over-the-break issues. A surprising number actually had nothing to do with playing the clarinet at all, some sample

titles in this category were *How does Vocal Fry Work?*; *Alto Flute Tone Studies for the Upper Register*; *Choice of Words: Make or Break?*; *Mr. Rooney's Phone Call (Ferris Bueller's Day Off)*, and *Classic Spongebob*. Additionally, videos that were clearly made by middle school or high school-aged students were excluded, as well as videos that simply demonstrated musical examples going over the break. The twenty-eight relevant videos were surveyed for audience, quality of the presentation, pedagogical soundness, and which of the four main approaches found in the print literature were demonstrated.

Intended audience was determined primarily by whether the narrator spoke in the first person about the methods used with students, or spoke directly to the listener about their playing, as a teacher would speak to a student. In some cases, the teacher made this very clear by referring to “students” or a specific student, or referring to things they had done previously in class. One video specifically indicated in the title that it was directed towards educators, but this was the exception. Other clues were garnered from the manner of speech and examples used: for example, one presenter commented that the notes looked like “smiley faces,” a comment that seems designed to appeal to young students.

Chapter 5: The YouTube Videos

Collin Meyers of the Fortissimo Music Project, in his 3:25 minute video *Clarinet: Crossing the Break* (2015) with 2,240 views (<https://www.youtube.com/watch?v=ZwUZdy7KxSg>) recommends keeping the tongue high in the mouth to maintain a fast air stream, then "just blow, move your thumb up, and press the register key." He demonstrates starting with B3, then working his way down to low E3. He then recommends keeping right hand down on the throat tones, practicing A4 slurred to B4, or Bb4 to B4. He also reminds the student to keep fingers close to the holes, and demonstrates this along with the right hand down technique. His brief video correlates with Approaches I and II found in the print sources.

Rtmsmusic (username) offers a 3:07 minute video *Getting above the Break on Clarinet!* (2013) with 4,209 views (https://www.youtube.com/watch?v=VCJRRO_ca-w). In this video he explains and demonstrates an exercise of "rolling down" (going down the scale) to E3, then "popping" the register key, an example of Approach IV. He then shows how the concert Bb scale on the clarinet crosses the break, and demonstrates fingerings for B4 and C5. He has a very friendly and relaxed approach, one that would work well with elementary and middle schoolers, but he struggles through the demonstration, and is not an ideal model.

Michelle Anderson's *Clarinet Lesson-Crossing the Break More Easily, moving from low notes to high Notes* (2013) 15:01 with 42,305 views (https://www.youtube.com/watch?v=ZPtr_S04pGg) is a 15:01 video on "how to train your fingers to move easily between the high register and the low register." Ms. Anderson also gives a website where an accompanying handout can be found, which she refers to during the video. She recommends training the fingers in three habits: keeping all fingers in a round, arched position,

moving fingers very gently up and down when changing fingerings, and training the fingers to stay as close to the keys as possible. Ms. Anderson clearly demonstrates both the "good" and "bad" finger habits as she explains. She explains and demonstrates the correct angle of the left index finger, which leaves the left index finger always touching the A key, and the correct way to roll the finger onto the A key. She then references an exercise on her handout which involves rolling your left index finger onto the A key while fingering C4, and discusses and demonstrates angling the thumb upward so that it always rests on the register key. Continuing, she references "Line 3" on her handout, an exercise that involves slurring across the break from A4 to C5, after which she demonstrates the next exercise which involves slurring from G4 to G5. She repeatedly reinforces and demonstrates right vs. wrong hand position. Ms. Anderson also recommends practicing looking in a mirror to see one's hand position. Next, she references exercises on her handout that involve slurring between E3 and A4, then A4 to B4. This video is a very thorough demonstration of Approach III.

In Anderson's second 12:30 video, *Clarinet Lesson: Faster Fingers, Crossing The Break More Easily - Left Thumb Position* (2013) with 6,296 views

(<https://www.youtube.com/watch?v=-bItDikinm4>), she focuses exclusively on the left thumb position, again an example of Approach III. She discusses how common problems with left thumb position are, and explains why poor thumb position makes the register transition more difficult. She gives a brief review of proper finger position for all the fingers, especially the left index finger, demonstrating with the clarinet. She then demonstrates right and wrong thumb position, and shows how the incorrect thumb position affects the other fingers. She demonstrates right and wrong from several different angles, recommends practicing the thumb and finger movement while not playing so you can look at the thumb and fingers as they move. Next she

explains a series of exercises from a handout on her website (www.learnclarinetnow.com), demonstrating that they should be done fingers only, not playing, so you can watch your fingers, and then playing. As she plays she demonstrates sounds that will indicate a problem with fingering, and common issues to watch out for, as well as showing how the fingers and thumb movements look on the clarinet from different angles.

Michelle Anderson also offers another series of videos, meant specifically for teachers, in the Backun Educator Series. In her 10:14 video *Better Clarinet Finger Technique-Especially Crossing the Break: Backun Educator Series* (2016), with 6,515 views (<https://www.youtube.com/watch?v=H0DYy3eC66w>), she shares a "hand puppet" technique for showing students how to round their fingers. She demonstrates the bad finger technique of collapsing the first knuckles of the fingers, and recommends ways to demonstrate to students that good hand position works better. She then shows an exercise for correct positioning of the left index finger, discussing common problems, how it affects crossing the break, and demonstrates while playing, showing correct finger movement and common problems of lifting fingers too high and excessive wrist movement. She recommends students practicing in the mirror, and also suggests a method of placing a pencil over student's fingers to prevent the student lifting the fingers too high. She also discusses correct and incorrect left thumb position and movement, and recommends having students practice correct thumb movement holding their clarinet away from the body and not playing, so they can see what the thumb is doing. Further, she discusses the importance of correct right thumb position on the thumb rest, how to adjust the thumb rest correctly for students, and correct hand and wrist angle for the right hand. She demonstrates common problems with right hand position and recommends an exercise where the student moves the pinky of the right hand around to ensure that they can reach the pinky keys. If the

hand is not in the correct position, it will be hard for the student to reach the pinky keys. This video is again a highly detailed example of Approach III.

Christopher Jones starts his 3:40 video *Crossing the Break on Clarinet G to D.wmv* (2010) with 17,048 views (<https://www.youtube.com/watch?v=kI5UH-p2CeI>), recommending practice with a mirror. He begins on G3, asking the student to make sure they have a nice, full sound, and are blowing air “all the way through the bell of the instrument.” Next, he asks the student to play G3 and “pop-up” to D5 by hitting the register key, demonstrating the movement of the thumb on the register key (Approach IV). He then describes what he usually sees with students attempting this exercise: a big “crunch” or big chin movement when they go to the upper note. He notes that this problem is occurring because the embouchure is not firm enough on the lower note. He recommends that the student make sure they are using the same firm embouchure on the low note that they are using on the high note. He explains that what the student should be aiming for is a smooth register change without a break in sound or an accent on the high note, and asks the student to listen to his demonstration. He then discusses other issues that could be causing a break in sound, and asks the student to try the exercise every day for a week, then add slurring A3 to E5 and Bb3 to F5, demonstrating Approach II.

Gregory Agid in his 2:51 video *Clarinet Lesson: Playing Over The Break: Part 1* (2017) with 973 views (<https://www.youtube.com/watch?v=FSpQd83It5E>), explains what playing over the break is, and why it is difficult: because so many things can go wrong. He explains that this video will deal with the “finger aspect” of over- the-break playing. He recommends two things to help with the transition from A#4 to B4. First, making sure all of the fingers are sealing the tone holes, and second, keeping the fingers of the right hand down while playing A#4 (Approach I). He demonstrates playing A#4 with and without the extra right hand fingers, saying “As you can

hear, it doesn't really affect the tone." He shows that he is putting the right-hand fingers down that will be used for the note B4, in preparation for playing the B4, and demonstrates playing from A#4 to B4 only moving the fingers of the left hand. He then demonstrates how a rolling motion of the right index finger must be used when moving it on and off of the A key, an example of Approach III.

In Agid's short 1:54 video *Clarinet Lesson: Playing Over The Break Part 2* (2017) with 429 views (<https://www.youtube.com/watch?v=sTRtIIgTa3w>) he starts with a flashy jazz solo that demonstrates over-the-break playing. He gives a PDF of the solo (*Cochise* by Alvin Batiste), and recommends using the first few notes of the PDF to practice playing over the break, resulting in a slurring pattern that starts with throat tone A (A4) to C5. He recommends and demonstrates keeping the fingers of the right hand down when going from A4 to C5, again an example of Approach I.

Graham Lyons offers at 7:10 minute long video *Crossing the Break* (2009) with 28,934 views (<https://www.youtube.com/watch?v=GHDMOJGxm2k>). He first demonstrates what it sounds like when the break is not crossed smoothly from A4 to B4. He then demonstrates how to roll the left index finger smoothly onto the A key, and demonstrates an exercise slurring from F#4 to second space A4. Following this he demonstrates how it will sound if done wrong, and how it will sound if done right. (Approach III). Next he recommends putting all the right hand fingers down on A4 before going to B4 (Approach I). He again demonstrates right and wrong approach, explaining what to listen for. He then recommends an exercise slurring A4 to B4 using the right hand down technique, then slurring G4, A4, B4. He reviews the two techniques he has demonstrated at the end of the lesson, and again plays a catchy jazz tune. Interestingly, he

demonstrates using the “Nuvo clarineo” (Nuvo Clarineo Standard, (n.d.), Fig. 5.1) an instrument specially developed for younger players:

“The NUVO Clarinéo is a clarinet in the key of C and is ideal for young starters ages 4 to 12 years. It is much lighter and smaller than a Bb clarinet which means the finger stretches are shorter and the tone holes smaller. This takes away a lot of the physical challenges of the Bb clarinet while encouraging kids to practice more and develop the skills and enthusiasm they will need when they are ready to step up. It can give a child up to three years head start on learning the clarinet. Since the fingering is the same, the transition to Bb clarinet is quick and easy when they are ready.” (“Clarineo,” n.d., para. 1)



Nuvo Clarineo Standard (n.d.)

Figure 5.1

Scott Engel offers a 13:05 minute video lesson *Clarinet Lesson, Crossing the Break* (2011) with 2,300 views (<https://www.youtube.com/watch?v=jMo0M6hcGcg>). He addresses the lesson to a specific student, “Olivia,” indicating it was created “for my grad class.” Mr. Engel does a thorough job explaining the break and reinforcing vocabulary: break, throat tones, chalumeau, clarion, register key. In his first exercise he demonstrates playing G3 for four

counts, then pressing the register key. He emphasizes “I’m just going to act like I am playing a low G, keep my air steady, and put the register key down and see what happens.” (Approach IV). He demonstrates and asks student to note that his face is not changing, then asks student to join him in the exercise. Next he asks the student to count up five notes from F with him to find out what note they will slur to from F, and invites the student to try slurring from F3 to C5 with him. For students experiencing problems like squeaks he recommends making a crescendo to the high note. He demonstrates slurring from E3 to B4 (encouraging the student to figure out the upper note for themselves). Then he extends the exercise, demonstrating E3-B4, F3-C5, G3-D5, A3-E5, and Bb3-F5. There is an unusual sound quality that he attributes to a microphone problem. He reinforces his main ideas with subtitles at the bottom of the screen as he says them. Next, he recommends that if the student is still having problems to try putting more mouthpiece in the mouth, make sure to use no pressure, and make sure to aim for a flat chin with no chin bunching. This part of the video demonstrates Approach II. Next he introduces crossing from throat-tone A4 to C5, getting fingers down cleanly and all together. He recommends practicing playing A4 to F4 cleanly, then when that is mastered, trying the same adding the register key. His video is well-planned as a lesson; he presents new information, demonstrates, and reviews.

In Kathy Williams-DeVries 10:12 video, *Going over the break for the first time on clarinet* (2012) with 3,539 views (<https://www.youtube.com/watch?v=NIXKX5SPaog>), she offers quite a bit of detailed verbal information about clarinet history and vocabulary. She explains the break, talks about the transition from the chalumeau to clarion register, naming and demonstrating the different registers, explaining the cylindrical bore and overblowing at the 12th. Unfortunately, while the information is quite good, her speech is very halting, with many "ums" and pauses, and the detailed information and halting pace could be difficult for young students to

engage with. She demonstrates slurred 12ths (Approach II), and also shares an exercise for strengthening the pinky fingers by moving the pinky around to the four different pinky keys while holding the thumb and other fingers in the same fingering. She also recommends putting the first, second and third fingers of the right hand down on the throat tones, and discusses different combinations of right hand fingers to leave down in different situations, depending on what clarion register note you are moving to (Approach I). Additionally, she makes a comment and demonstrates that even leaving some extra left hand fingers down will not have much effect on throat tone A (A4).

Deborah Sheldon's 3:50 video *Clarinet-Going Over The Break* (2017) with 217 views (<https://www.youtube.com/watch?v=1d8tCyavfSA>), is offered on a CD packaged with the *Measures of Success* band method book, and is also available on YouTube. As would be expected for a professional product marketed as part of a band method, the video is quite a bit more professional in its presentation than many of the other offerings, opening and closing with exciting up-tempo music, and presented with fast pacing and a sense of excitement which would appeal to a young student. With the assistance of a clarinet specialist, Dr. Sheldon gives a live demonstration of the "surprise pop-up" or "assisted register pop-up", an example of Approach IV. She reminds the clarinetist to keep the air the same when moving through registers, then asks him to play a low F while closing his eyes, surprising him by pressing the register key. After this, she asks him to play the same notes (F3 to C4), after he gives a visual demonstration of how to roll the thumb up onto the register key (Approach III). She then has the clarinetist demonstrate G3 to D5, and E3 to B4 (Approach II).

Jcpatterson7272 presents a 11:01 video titled *Clarinet-Crossing the Break* (2017) with 82 views (<https://www.youtube.com/watch?v=RzyBkBp68RM>). He explains the break as the place

where you go from very few fingers to all or almost all fingers. He demonstrates a common problem going from A4 to B4 to show how it sounds, then invites the student to play along with him on B4 fingering without the register key (which produces E3). He demonstrates how it should sound, and how it will sound if holes are not completely covered, and reinforces good hand and finger position (referring to an earlier video). Then he has the student play again, looking at their fingers, then a third time. He advises the student that if it is still not working they should try "rolling down" from C4, playing C4, B3, A3, G3, F3, E3. He tells the student not to go on to the next part of the video until they can do this part correctly, then has them play E3 and pop the register key (he calls it the teardrop key). He demonstrates, saying "that's what we want to hear," then invites the student to try it with him (Approach IV). He then demonstrates what it will sound like if fingers are not on the holes, recommends that if they get that sound they check their fingering, then shows the common places where students might have moved a finger off the hole. He shows the thumb to demonstrate correct thumb angle, then complements the student saying "I'll bet you're doing that better!" He then turns to the index finger motion and position and has the student practice going from A4 to F#4 to practice the correct finger position and motion, stating that if it is not smooth they should keep working on it so they don't get any "junk in between the notes." He reminds the student again to make sure their left thumb is diagonal (Approach III). He then reviews fingerings, demonstrating A4 and B4 fingerings, and recommends that the student can practice this without playing. Next, he invites the student to practice playing A4 to B4. He asks "how did you do? If this happened (demonstrates sound if hole is uncovered) ...once again, I was not covering a hole all the way." He demonstrates places they might be leaking air from a hole, and how it will look, and reminds students not to change embouchure or bite when going from throat tones to clarion notes. The pacing and tone are very

much the way a good middle school band director would speak in class, especially in the explaining, demonstrating, then asking the student to try it in quick succession, and immediately addressing problems that students are likely to encounter, then repeating after the correction.

In his 6:09 video *How to Play High Notes on Clarinet in Two Easy Steps! (Part 1)* (2016) with 190,028 views (<https://www.youtube.com/watch?v=giUDuu-jh4s>), MrSelfridge, like jcpatterson, adopts an approach much like the classroom manner of a good middle school band director. He starts by saying “I’ve been getting a lot of questions from you guys asking about how to play the high notes on clarinet.” He demonstrates the lower register, going down to E3, then demonstrates how lifting each finger one at a time ascends up the notes of the scale, to G4. He then shows how the ascending pattern can be continued by pressing the A key, and then the Bb key, noting that after this there are no more fingers to lift or keys to press to get the next note. He explains, “This is where we have to switch over to our upper register, and this is why we call it crossing the break, but it’s not as hard as you might think.” In “step 1,” he starts by playing a low note with a “really strong sound.” He reminds the student to use proper embouchure, which he calls “band face,” and proper holding position. In “step 2” he explains using only the tip of the thumb to press the register key, while not moving anything else. He then has students play middle C and move the tip of the thumb only to press the register key to play clarion G (combining Approach III and IV). Next, he says “Pause this lesson and give it a try on your own.” If it is not working he recommends re-checking embouchure, which he explains and demonstrates in detail, checking that enough mouthpiece is in the mouth, and making sure the left thumb is not sliding off the hole in back, and other fingers are not sliding off in front. He also mentions that a reed that is too soft could cause a problem. This video is well-produced with very clear visuals, an energetic tone that is appropriate for a middle-school audience, good

explanations with frequent reminders, and the instructions and reminders written in text as well as given verbally.

MrSelfridge continues in a second 4:01 video *How to Play High Notes on Clarinet in Two Easy Steps! (Part 2)* (2016) with 58,024 views (<https://www.youtube.com/watch?v=ZxejP5W0ffc>). In this video he shows the student how to slur up a 12th from Bb3, A3, G3, F3, and E3 (Approach II). He displays a fingering chart graphic for each new note, as well as showing the musical notation and demonstrating aurally and visually on the clarinet, and reminds the student to double check that they are covering the finger holes and not moving any fingers that should be covering the keys. He reminds the student once again to make sure all holes are covered, and to check that they are not hitting any side keys unintentionally.

David Etheridge offers a 2:33 video, *David Etheridge gives a Lesson on Register Change for Clar* (2009) with 3,220 views (<https://www.youtube.com/watch?v=j331c3f8x0E>). He begins by explaining the clarinet break and demonstrates by playing over the break in two scales. He says there are two important components to making the register change, and that number one is rolling the left index finger from the F3 tone hole to the A key (Approach III). He refers to a flute hand position trick “that I showed you earlier,” that must be from an earlier video. He offers an exercise to prepare for the register change, slurring from A4 to F#4, and demonstrates it but does not explain it. Then he addresses the problem of coordinating the fingers with the tone holes. He recommends going from high notes to throat tones first (B4 to A4), “as in the above exercise” (no visual is given) then playing the scale down and up. He gives a demonstration. As this video is very brief and does not offer in depth explanations, right vs. wrong demonstrations or reinforcement of presented ideas, it would not be a good fit for an elementary or middle

school student. The lack of detail also makes it less useful than some of the others from a teacher's perspective.

The Clarinet Project offers a 4:37 video *Mini Lesson: Playing Over the Break on Clarinet* (2017) with 120 views (<https://www.youtube.com/watch?v=MfCqbsz4eyA&t=100s>), about going from A4 to B4, in response to a request from another user named “cookie monster.” She shows fingerings for both notes, holding clarinet up for a better view, and discusses common problems: students who bunch up their left hand fingers away from the keys when playing A, and positioning of the left thumb on the register key. She gives a quick visual demonstration of correct hand and thumb position, and offers an exercise, writing the notes on the whiteboard, playing whole note B4, slurring down to whole note A4, and back to B4. She again explains the correct finger and hand position detail after playing, and demonstrates. She demonstrates a third time, and stresses to roll the finger on and off the A key, pressing it with the side of the finger, reminding students to keep fingers close (Approach III). She also mentions that right-hand fingers may be left down on A4, and recommends that students use a mirror or video themselves (Approach I). She then asks the student to practice A4 to B4 and notes that the exercise can be done with any two notes that cross the break, A4 to C5, A4 to C#5, B4 to Bb4, B4 to side G#4. Her lesson is clearly aimed at elementary or middle school aged students, for instance she comments twice on how the notes with slurs below look like a smiley-face.

Joel Brainard offers a 2:05 video *Practicing “Over the Break” on Clarinet* (2013), with 1,074 views (<https://www.youtube.com/watch?v=BudppHgSBEQ&t=12s>). Brainard introduces himself as a middle school band director, narrates the video and has a clarinetist named Sandy demonstrate an exercise where she plays C5, B4, A4, G4, A4, B4, C5, slurred slowly then faster. He notes for the viewer that she is keeping the right-hand fingers down for the entire exercise

(Approach I), and has her play the exercise again while saying the letter name for each note, then asks her to play it faster. At the end he says: “Guys make sure you practice that nice and slow...” The familiar way he addresses the viewer suggests that the video is aimed at his own students.

Joel Brainard also offers a second 3:15 video entitled *How to Play the Clarinet High Register* (2013), with 7011 views (<https://www.youtube.com/watch?v=ylpHEZ8GMjU>). Like the previous video, this one is clearly directed towards students. The clarinet specialist is the same, now introduced as Sandy Clevinger. She starts this video discussing how students who have difficulty getting low register F3 and E3 will also have trouble with their high register. She reminds students to make sure all of the fingers are covering the holes completely. Next, she starts an exercise with Bb3, showing and remarking that the thumb is at a 45-degree angle (Approach III), then hitting the register key to get F5. She explains verbally while showing the fingerings, then demonstrates. Next she demonstrates the same technique from A3 to E5, G3 to D5 and F3 to C5 (Approach II). The director asks her at this point if the tongue or teeth should change, she answers that nothing should change except the thumb. Then she shows the exercise starting on E3 going to B4. After this, she recommends starting on C5 and going down the C scale.

Kaitlyn Neer offers a 6:52 video, *Crossing the break on Bb Clarinet* (2017) with 90 views (<https://www.youtube.com/watch?v=sU2nAhMAzJ8>). In her video she states that it is important for the low register to be strong in order to cross the break, because the clarion register fingerings are the same but with the register key added. She emphasizes that it is important to make sure all the holes are completely covered and fingers are not leaking. She then describes the exercise she is going to demonstrate, number 98 from the *Accent on Achievement* book, slurring “from low to high” from A3 to E5, Bb to F3 and C4 to G5 (Approach II). Unfortunately,

she has serious trouble with squeaking in her attempt to demonstrate, and is not able to play the exercise correctly. She then explains that the right hand fingers can be left down when crossing the break (Approach I), and describes the next exercise “C on the staff down to the G”. Again, she is unable to demonstrate the exercise correctly.

Over the Break Clarinet Tips and Buzz Stroke (2016) with 614 views, published by gmilllerpausd (<https://www.youtube.com/watch?v=HucoE-vHmQY>), is 2:04 minutes long. It opens with a discussion of buzz stroke for snare drummers, then moves to a discussion of the clarinet break. She refers to “the exercises on the purple sheet,” where they will add lower fingers and then “pop it up to the high note by flicking that thumb key.” (Approach IV). She demonstrates and then discusses why it may not work for some students; the embouchure may need to be firmer, the student may not be using enough air, and finger holes may not be covered. She then demonstrates what each problem sounds like on the clarinet.

In his 12:10 video *Playing Over the Break* (2016) with 103 views (<https://www.youtube.com/watch?v=HRetD-24bvc>), Joseph Santanello begins “welcome student,” then defines the clarinet break. He uses graphics to show notation and fingerings, and asks students questions throughout, such as identifying the notes. He reinforces terminology throughout the video verbally and with graphics, identifying the register key. He explains that to play high, strong low notes are important, and leads the student note by note down from C4 to Bb3, A3, G3 and F3, asking students to identify and try each note, and showing the notation and the fingering chart for each. Then he tells the student that once they have a strong sound on the low notes they are ready for the high notes, but if they are getting squeaks on the low notes, they should check their fingers and practice in the mirror so they can make sure the fingers are completely covering the holes properly. Next F3 is played, then the thumb slides up to the

register key to play C5. He continues to ask the student to identify each new note, and check in the mirror that all holes are covered if they are getting squeaking. He then asks the student to play the C without playing the F first, complimenting the student, saying “you’re doing a great job.” Next he moves on to playing D5, then E5, F5 and G5 in individual notes, then connected in a phrase. He then moves back to F3, showing how the register key changes it to C4, G3 becomes D5, A3 becomes E5, etc., demonstrating as he explains (Approach II). At the end he encourages the student to go to his web page and take a quiz on the information they have just learned.

Jonathan Fultz, in his 2:48 video *Clarinet Lesson 4 Playing High* (2013) with 142 views (<https://www.youtube.com/watch?v=SNgzpzAfJAU>), starts out by describing his process for introducing beginners to the clarinet high register, speaking in the third person as if he is talking to another teacher. He explains that when students are about two-thirds of the way through the beginner book, there is a series of songs and exercises in the low register where only the fingers of the right hand move. He describes how once students can play these songs in the low register, he then has them hit the register key and play the same exercises a 12th higher, then demonstrates (Approach IV). At this point he switches to first and second person “I” and “you” indicating that he is addressing a student directly. He then describes and demonstrates playing rising 12ths by adding the register key to G3, A3, Bb3 and C4 (Approach II). He also demonstrates how the exercise will sound if attempted with an embouchure that is not strong enough. He then demonstrates the high register up to high C, and says “...if you can play this note you can play any note on the clarinet.” He demonstrates these notes again showing what they will sound like if the embouchure is not strong. He apologizes for his “cheesy vibrato,” explaining that he is a trumpeter.

In the 7:29 video *Clarinet Lesson: Low to Middle Notes* (2013) with 13,012 views (<https://www.youtube.com/watch?v=cD15ptlikX4&t=15s>) from clarinet-tips.com, the narrator (Andrea) begins by explaining that she will be going over tips on how to go between the chalumeau and clarion register, then demonstrating the chalumeau and clarion registers. She recommends starting on “thumb F” (F4) and going down through the notes of the F scale to E3. She then asks the student, when they are comfortable with that, to press the register key without changing anything else, to go to B4 (Approach IV). She advises the student that if they are having trouble, to make sure that they are using “very fast air,” and demonstrates how it will sound if the air is too slow. She also advises the student also to make sure they are not changing their embouchure, and demonstrates the exercise correctly again. In the next step she goes down the F scale to F3, then hits the register key to go to C5; then likewise down to G3 and up to D5; down to A3 and up to E5; to Bb3 and up to F5; to C4 and up to G5; to D4 up to A5; to E4 up to B5; then starting on F4 and going up to C6 (a variation of Approach II). At the end she gives a brief verbal review of the exercise. Although she never says so, her clean technique and warm tone suggest that, unlike some of the other demonstrators in over-the-break videos who are clear about the fact that clarinet is not their first instrument, she is a classically trained clarinet player.

In Red Clay Beginner Band’s 5:14 video *Advanced Clarinet: high notes!* (2014) with 22,744 views (https://www.youtube.com/watch?v=nnTemlCWj_c), the narrator introduces herself as Mrs. Tosh Morelli. She starts with a demonstration of the thumb position and thumb action on the register key, saying ‘...tip the top of your thumb, just to open the key just a tiny, tiny bit,’ an example of Approach III. She reminds the student to make sure all holes are covered all the way. Then she asks the student to play C4 and tip the register key to get a high note, then try the same with Bb3. She notes that if the student is not getting a nice clear note, one of the

fingers may not be closing the hole all the way, or may be hitting another key by mistake. She notes that the likely culprits are either the ring finger, the thumb, or that the student may be hitting the Ab key unintentionally. She repeats the exercise on A3 and G3, and F3. She shows the fingerings and correct hand position for each new note, reminds the student that if the low note does not come out, the high note won't, and reminds them that the thumb should not move around side to side or up and down too much when pushing the register key, it should simply tip the register key. While she never names the high notes, the exercises are all rising 12ths, Approach II.

Jim Dougal, in his 6:53 video *Clarinet High notes up to "G"* (2015) with 10,825 views (<https://www.youtube.com/watch?v=Gnj7MCw3sjs>), demonstrates an exercise slurring down the C scale from G5 to B4, then up from B4 to C5. While his explanations and teaching techniques are good, his tone is not. This is an interesting example of the phenomenon that on the internet, more hits does not necessarily signal a better video. In this case the extremely negative comments suggest that the bad tone may have actually attracted more viewers, who watched and listened for the sole purpose of leaving abusive comments. After these two scalar exercises, he demonstrates that in going from A4 to B4, the fingers of the right hand can be left down (Approach I). Similarly, in an exercise using A4, B4 and C5, and in playing the C scale, he shows that the right hand fingers may be kept down on the throat tone notes.

In the 5:49 video *Introduction to Playing High Notes on the Clarinet* (2017) with 505 views (<https://www.youtube.com/watch?v=Xm5AFz7IRMc>), hindsite4 notes that once you feel comfortable enough to get good quality sound on your clarinet low notes, you are ready to play the high notes. He starts out by talking about the left thumb pressing the register key. He demonstrates and explains that only the tip of the thumb should be used to press the register key,

and that if the thumb moves upward to press the register key it won't cover the thumbhole properly (Approach III), and adds that and that one should watch out to make sure that the Ab key is not pressed by accident. He explains and demonstrates playing C4 for two counts, then adding the register key to play a higher note, not telling the student what note they are playing until he repeats the note to start a new exercise going down the C scale from G5 to C 5 and back up. Then he descends from G5 to B4 and back up to G. He ends by playing an exercise he calls "April Number One".

In *Michael Dean Clinic at Texas Bandmasters: Going Over the Break* (2010) with 296 views (<https://www.youtube.com/watch?v=3OSvr-IHrVE>), a 1:50 video of a presentation from the Texas Bandmasters Conference, Michael Dean explains going over the break and what a critical issue it is for clarinet players. He says "careful just leaving your right hand down all the time...if you've got a kid that just can't do it, ok you can do that a little bit...but to really learn to play clarinet, you've got to do it the right way." He recommends going over the break every day, two different ways, with alternate fingerings, starting on B4 and working down. He doesn't really recommend any other techniques, but his video is notable in that it warns against overuse of Approach I.

In the 4:50 video *Clarinet Upper Register* (2009) with 5,809 views (<https://www.youtube.com/watch?v=Ot7MMOla-rQ&t=7s>), schoellkopf99 begins by talking about the notes the students have done previously in the lower register, an indication this is a video directed at her students. She talks briefly about what she means by the upper register, why it needs more air, and the meaning of frequency. She makes an unfortunate mistake of directing the student to slide their pinky on the register key rather than their thumb. Because the video only shows the top of the clarinet and not the part where the hands are, the visual demonstration

does not clarify that she means the thumb. She then demonstrates slurs in upward 12ths, starting on E3, F3, F#3 and G3 (Approach II).

Chapter 6: Analysis and Conclusion

An analysis of the approaches in the YouTube videos studied yields some interesting information. For instance, while Approach I (keeping right-hand fingers down on the throat tones) was the most common approach found in the print literature, in the YouTube videos Approach II (slurred 12ths between the low chalumeau and clarion register) and III (focusing on left thumb and index finger movement) were the most common approaches, with thirteen videos each. Approach I and IV (techniques for keeping air, embouchure and support the same when crossing the register break) were each found in nine videos (see Table 6.1). Three of the videos were clearly directed at teachers, sixteen were clearly directed at elementary or middle school-aged students, and nine were indeterminate as to their audience (Table 6.2).

Approach I: Recommended Video for Teachers

In assessing the videos available for teachers to demonstrate the "right-hand down" technique, Approach I, it became clear that none of the videos captured the level of detail found in the print material. There is an essential piece of information that teachers need to grasp when teaching Approach I, detailed by Westphal (1962) and Abramson (1983); depending on the situation, different combinations of right-hand fingers may be left down on the throat tones to facilitate crossing the break. None of the videos addressed this point effectively. The fact that this information is not thoroughly explained in the YouTube videos on crossing the break may be due to the fact that the majority of the videos are directed towards students, and the presenters thought it better to deliver the information in small chunks. It also may be due to the fact that video is not the most efficient medium for communicating this particular bit of information. The concept that can be communicated in a quick glance at Westphal's graphic (Fig. 3.2) -that the

right hand fingers which are left down will depend on the upper note one is going to or coming from- would be quite a bit more cumbersome to demonstrate in a video, since it would require demonstrating many different combinations of notes.

Table 6.1-Approaches and Duration of YouTube Videos

Video	App. I	App. II	App. III	App. IV	Time
Meyers	X	X			3:25
Rtmsmusic				X	3:07
Anderson 1/2013			X		15:01
Anderson 5/2013			X		12:30
Anderson 10/2106			X		10:14
Jones		X		X	3:40
Agid 1/2017	X		X		2:52
Agid 2/2017	X				1:54
Lyons	X		X		7:10
Engel		X		X	13:05
Williams-DeVries	X	X			10:12
Sheldon		X	X	X	3:50
Jcpatterson			X	X	11:01
MrSelfridge Pt. 1			X	X	6:09
MrSelfridge Pt. 2		X			4:01
Etheridge			X		2:33
The Clarinet Project	X		X		4:37
Brainard 2:05	X				2:05
Brainard 3:15		X	X		3:15
Neer	X	X			6:52
gmillerpausd				X	2:04
Santanello		X			12:10
Fults		X		X	2:48
clarinet-tips.com		X		X	7:29
Red Clay Beginner Band		X	X		5:14
Dougal	X				6:53
hindsite4			X		5:49
Dean					1:50
schoellkopf99		X			4:50

Table 6.2- Distribution of Teacher-Oriented, Student Oriented, and Neutral Videos

Video	Teacher-oriented	Student-oriented	Neutral
Meyers			X
Rtmsmusic			X
Anderson 1/2013			X
Anderson 5/2013			X
Anderson 10/2106	X		
Jones			
Gregory Agid 1/2017		X	
Gregory Agid 2/2017		X	
Lyons			X
Engel		X	
K. Williams-Devries			X
Sheldon		X	
Jcpatterson		X	
MrSelfridge Part 1		X	
MrSelfridge Part 2		X	
David Etheridge			X
The Clarinet Project		X	
J.Brainard 2:05		X	
J.Brainard 3:15		X	
Kaitlyn Neer			X
gmillerpausd		X	
Joseph Santanello		X	
Jonathan Fults	X		
clarinet-tips.com		X	
Red Clay Beginner Band		X	
Jim Dougal			X
hindsite4		X	
Michael Dean	X		
schoellkopf99		X	

Both Kathy Williams-DeVries *Going over the Break for the first Time* (2012) and Joel Brainard's *Practicing "Over the Break" on Clarinet* (2013) discuss adding right-hand fingers to the throat tones when going over the break, but Brainard's explanations of the technique are more straightforward. Williams-DeVries has a slightly different take on the approach, in which she also discusses the possibility of also adding extra left-hand fingers to the throat tone A. This

approach was not seen in any of the surveyed print literature, and while Williams-DeVries only mentions it as a possibility, it could create some confusion for someone trying to understand the approach. As a result, Joel Brainard's *Practicing "Over the Break" on Clarinet* (2013) is recommended for teachers wanting to see a demonstration of Approach I, in spite of the fact that it is a student-oriented video. More importantly, it is recommended with the caveat that any teacher that wants to fully understand this concept will also need to consult the print literature.

Approach I: Recommended Video for Students

Of the ten videos that demonstrate Approach I, Joel Brainard's *Practicing "Over the Break" on Clarinet* (2013) is also the strongest student-oriented video. Of the other videos that demonstrate this approach, several only mention it in passing, and do not offer detailed discussion and demonstration. One other video does offer detailed discussion and demonstration: Williams-DeVries (2012), delves into the material in such a detailed way that it is likely to lose the attention of the average elementary or middle school student. Additionally, her pacing and rather halting manner of speech make this video less than ideal for a young student. Finally, as mentioned above, Williams-DeVries also suggests the possibility adding left-hand fingers to throat tone A (A4), which is not typical in the approach found in the print literature surveyed, and could create confusion for a student learning the technique. Joel Brainard's approach of setting up a dialogue between himself and the demonstrating clarinetist allows him to ask questions, reinforce important ideas, and direct the student's attention to the essential information. The visual and aural demonstration of the fingering exercise is offered slowly, and then faster, with a verbal explanation of notes and note values. Reminders to the student to

practice it slow first, then fast are well-matched to the needs of an elementary or middle school student.

Approach II: Recommended Video for Teachers

Among the videos surveyed there were no teacher-oriented videos that demonstrated Approach II. There was however, one student-oriented video that could be helpful to teachers. While *Crossing the Break on Clarinet G to D.wmv* (Jones, 2010) makes it clear that the video is aimed towards students, by addressing the listener as “you” and giving directions such as “try this now” or “listen one more time before you try this,” it also effectively demonstrates the concepts that teachers need to understand in order to teach Approach II. Throughout the video the narrator gives tips about problems to look for in the embouchure and finger movements, and how to correct them, which are the same things a teacher would need to look for when teaching Approach II.

Approach II: Recommended Video for Students

There were several strong candidates for student-oriented videos using Approach II. *Playing Over the Break* (Santanello 2016) is notable in that it presents the information with manner and pacing appropriate to elementary and middle school students, using an interactive graphic of the fingering chart and notes along with verbal and aural demonstration. Watching this video is somewhat like watching a teacher write on a whiteboard or a smartboard while listening to them demonstrate. The advantage to this strategy is that it is an approach that will appeal to visual learners, and the connection between note name, fingering, and notation on the staff are constantly being reinforced. The disadvantage is that the actual clarinet and how the

fingerings look on the clarinet is never shown, so a certain amount of kinetic information is lost. *How to Play High Notes on Clarinet in Two Easy Steps! (Part 2)* (MrSelfridge, 2016) uses visuals of the fingering chart and written notation in addition to a visual and aural demonstration on the actual instrument. The fact that he presents the information four different ways, while constantly reinforcing the connection between fingering, notation, sound, and how it looks on the clarinet makes this the strongest example for this category. Santanello (2016), however, is highly recommended for use with learners who might be overwhelmed by too much visual information, and would benefit from a simpler format.

Approach III: Recommended Video for Teachers

Approach III is a two-fold approach, involving both the movement of the thumb and the movement of the index finger. Of the eight videos that demonstrate Approach III, the majority explain and demonstrate one or the other; only two address both the movement of the thumb and the movement of the index finger: *Better Clarinet Finger Technique-Especially Crossing the Break: Backun Educator Series* (Anderson, 2016) and *Clarinet-Crossing the Break* (jcpatterson, 2017). Of these two, Anderson (2016) is clearly aimed at teachers, indicated both by its title and in the extremely detailed approach to the subject matter. Anderson offers good visuals of the hand-position issues she discusses in this video, extensively discusses common problems, demonstrates right vs. wrong position, shares ways to explain correct hand position to students, offers exercises to use with students, and discusses the problems that will result from incorrect hand position. This video is the strongest of the teacher oriented videos for Approach III.

Approach III: Recommended Video for Students

Clarinet- Crossing the Break (jcpatterson, 2017), addresses correct positioning of the left thumb and index finger in a way that is very appropriate for elementary and middle school students, using a friendly tone with vocabulary appropriate for this age group, and explaining any concepts that are likely to be new to a student at this level, using simple language reinforced with visual and aural demonstration. The pacing is slow with careful explanation and constant visual reinforcement throughout. The narrator uses a scaffolding strategy: first explaining, demonstrating, and asking the student to try new concepts in quick succession, then immediately addressing problems that students are likely to encounter, and asking students to try it again after the correction. The pacing, vocabulary, manner, scaffolding approach, invitation to the student to participate, and the fact that each concept is addressed from a verbal, visual and aural standpoint make this an excellent video for elementary and middle school students.

Approach IV: Recommended Video for Teachers

Approach IV includes two different teacher-dependent approaches, the “surprise” or “assisted” register pop-up, and the technique of turning around the keywork and fingering the pitches for the student so they will not know when the register change is coming. The technique of turning around the keywork was not represented in the videos surveyed, which is unfortunate because it would be useful to see how an experienced teacher would execute this. The assisted register pop-up was represented in one video, *Clarinet-Going Over The Break* (Sheldon, 2017). This video is clear and well-produced, the positioning of teacher and student as well as the key being pressed are easy to see, and the video shows how this technique can be achieved with minimal invasion of the student’s personal space.

Approach IV: Recommended Video for Students

There were three very strong candidates for the best student oriented video for Approach IV: *Clarinet Lesson, Crossing the Break* (Engel, 2011), *Clarinet- Crossing the Break* (jcpatterson, 2017), and *How to Play High Notes on Clarinet in Two Easy Steps! (Part 1)* (MrSelfridge 2017). All three are well-presented in a friendly tone with vocabulary and examples appropriate for an elementary or middle school student, and with frequent encouragement and reminders for the student to try it on their own. Both jcpatterson (2017) and Engel (2011) reinforce their ideas with printed subtitles throughout the lesson. While jcpatterson (2017) and MrSelfridge (2017) are both extremely good videos that demonstrate a sound pedagogical approach, it is clear that both of these teachers made the videos specifically for their own students, and not for a wider audience. Because of this, both at times refer to previous lessons, and use their own personal terminology for certain things, which in some cases does not work for an audience outside of their own students. For instance, when reminding students to use the correct embouchure, MrSelfridge uses the term “band face,” clearly a term that he uses with his own students, and of which they have a prior understanding. While this is perfectly sound from a pedagogical perspective, it makes the video less useful to a student that does not have prior understanding of his terminology. Similarly, jcpatterson (2017) makes reference to an earlier video as part of his explanation of correct hand position. Because of this, his video is less useful as a stand-alone video for demonstrating Approach IV. Engel (2011) gives the most specific information to the student without necessitating prior understanding of terminology or access to prior videos, and as a result it is the best student-oriented video for this approach.

Most Approaches in One Video

As time is often at a premium in the teaching world, it is useful to know when there is one source that can provide multiple pieces of information. Unlike the print literature, which includes one source that covers all four approaches (Tavarez, 2005), none of the video sources cover all four. Sheldon (2009), however, covers three out of the four, and would be the top choice if one only had enough time to review one video. The fact that she is a highly experienced professional educator, and the high quality of the video and the demonstrations reinforce this choice.

Crossover Between Print and Video Sources

As mentioned earlier, Sheldon's 2009 video is an example that crosses between the print and internet video category, having been originally published as a compact disc that was included with the *Measures of Success* band method. As compact discs become less common and the information once found on them moves to internet files available on various platforms, it is likely to become more common for information supplementing method books to be made available over the internet, as it is in this case. As such Sheldon's video is likely a harbinger of the way that this type of pedagogical information is likely to appear in the future.

Recommendations for Further Study

There is a great deal of research still to be done in this subject area. One related subject that has not yet been explored in the literature of clarinet break pedagogy is an empirical evaluation of the effectiveness of the different approaches to teaching over-the-break playing to beginners. Additionally, while this study addressed YouTube resources, there are many internet

resources beyond YouTube that have yet to be addressed, including websites focused on clarinet playing and teaching, other video platforms such as Vimeo, and print information available on the internet. As pedagogical videos become a focus for scholarly study, design of an evaluation instrument for these videos will be necessary. Much of the further research to be done will also involve the changeability and instability of internet resources. Frequent updates to research will be needed: new resources will be added and the availability of older resources cannot be guaranteed. New categories of internet resources are constantly being invented; for example, Dr. Danielle Woolery of Texas Women's University is working with her students to create a searchable database of clarinet literature. Within a few years it is likely that resources will be available that few today can conceive of, let alone evaluate. As new types of resources develop and grow there will be a need for scholarship to study and evaluate them, in order to understand how they fit into the changing landscape of pedagogical information available to educators. Future researchers will also need to develop evaluative instruments and more permanent databases for this growing body of information.

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Vita

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