

**Boston University****OpenBU****<http://open.bu.edu>**

BU Open Access Articles

BU Open Access Articles

2018-05-02

# Pedagogical content knowledge for SHIFTING: More than a toolbox of tricks

*This work was made openly accessible by BU Faculty. Please [share](#) how this access benefits you.  
Your story matters.*

Version	
Citation (published version):	D. Grieser, K. Hendricks. "Pedagogical content knowledge for SHIFTING: More than a toolbox of tricks.." American String Teacher, Vol 68, Issue 2, pp. 16 - 19.

<https://hdl.handle.net/2144/29277>*Boston University*

Pedagogical Content Knowledge for *Shifting*:

More than a Toolbox of Tricks

Citation:

Grieser, D. R., & Hendricks, K. S. (in press, 2018, May). Pedagogical content knowledge for shifting: More than a toolbox of tricks. *American String Teacher*.

The heterogeneous string classroom can often present challenges to string teachers in knowing how to help a variety of students develop complex string technique such as shifting and vibrato. Just like teaching any skill in any subject, teaching string-specific technique requires specific types of knowledge; and long-term success depends largely on ensuring that technical fundamentals are well taught. In this two-part series we will address the issues of pedagogical content knowledge—the integration of content knowledge and pedagogical knowledge—in regard to shifting and vibrato in the heterogeneous string classroom, in order to demonstrate how knowledge of technique works hand-in-hand with knowledge of teaching.

In this first article we focus on shifting technique, and in the second we discuss vibrato. Previous research suggests that teachers who have pedagogical content knowledge to teach a concept or skill can help students deepen the understanding of complex skills and concepts. In this article, we will discuss various teaching strategies from the pre-shifting exercises to early shifting exercises. We will explore common shifting challenges and realistic teaching strategies that take into consideration the large heterogonous string classroom.

### **Pedagogical Content Knowledge**

Educators use both content knowledge and pedagogical knowledge to transform the subject matter in a way that students are able to understand. In the *Knowledge Growth in Teaching* project, Shulman (1986, 1987) developed a theoretical framework for the understanding of teaching that included both subject-specific content knowledge and pedagogical knowledge. As shown in Figure 1, pedagogical content knowledge (PCK) is the intersection of content knowledge and pedagogical knowledge.

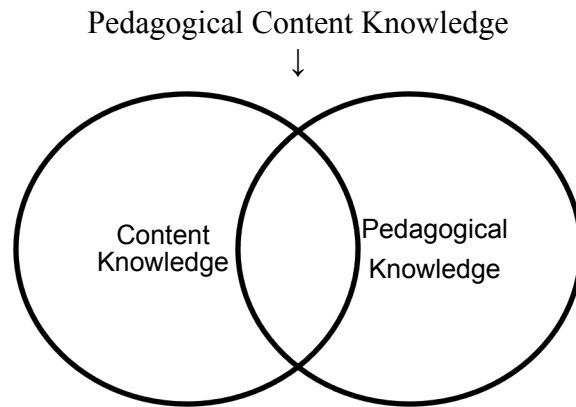


Figure 1. Model of pedagogical content knowledge (PCK). Adapted from “Knowledge and Teaching: Foundations of the New Reform” by L. S. Shulman, 1987, Harvard Educational Review, 57(1), p. 8.

*Content knowledge* is related to the teacher’s factual knowledge of a particular subject and an understanding of how to organize the subject matter in order to teach it. Examples of music content knowledge might include performance skills on primary and secondary instruments, music theory, analysis, arranging, music history, instrument fingerings, repair, and conducting skills are all. The degree to which teachers possess specific content knowledge may influence how they represent their discipline to students (Grossman 1990).

*Content knowledge* includes the principles of conceptual organization and the principles of inquiry. Essentially, content knowledge refers to the organization of facts and ideas of the subject and the set of rules and norms that support the content to be learned or taught. A teachers’ understanding of the content knowledge may influence the concepts chosen, how concepts are taught, knowledge about when students do or do not understand a concept, and how to represent the content at an ability-appropriate level.

*Pedagogical knowledge* refers to a particular an instructional approach to teach content knowledge. Although string pedagogies have been developed to teach string instruments and string technique, there is no general consensus on how to teach string technique. Some studies

have provided useful pedagogical knowledge regarding how to teach string-specific technique (see, for example, Geringer et al. 2005; Gillespie 1988, 1993; Sievers 2005). String educators often integrate multiple pedagogical approaches that are drawn from a number of teachers (e.g., Suzuki, Rolland, Galamian) to teach specific string skills. An eclectic pedagogical approach often relies on instructional strategies pulled from a “toolbox of tricks” and may or may not be related to subject-specific content knowledge.

Teachers use both content knowledge and pedagogical knowledge to transform the subject matter in a way that students are able to understand. An understanding of the ways in which pedagogical knowledge works in tandem with content knowledge can provide educators with an “instruction manual” or guide for using a pedagogical “toolbox.” In the next section, we illustrate a scaffolded approach for teaching shifting in which we combine elements of pedagogical knowledge with content knowledge.

### **Pedagogical Content Knowledge for Teaching Shifting**

#### **Content Knowledge of Shifting**

Understanding content knowledge is critical for choosing a pedagogical approach or method for shifting. According to Hamann and Gillespie (2013), the thumb should not be left behind during the shift, and should travel naturally with the hand. Additionally, there is a transport or guide finger used when shifting, and the transport finger should travel smoothly and lightly on the string during the shift. Moreover, the bow should stop briefly between shifting notes that are not slurred. For slurred pitches, the weight of the bow on the string lightens slightly during shifts between slurred pitches to diminish some of the shifting sound. The left-hand shape generally stays the same during shifts involving positions, one, two, three, and four (Hamann and Gillespie 2013, p. 138). Also fundamental to a relaxed shifting hand is a balanced

instrument and relaxed left arm and shoulder. In higher positions above the bout of the instrument, the left arm opens and the elbow angle changes to allow the arm and hand to remain relaxed while the fingers maintain curved and centered on the fingerboard.

### **Pedagogical Knowledge of Shifting**

Due to the lack of agreement among string teachers on how to teach string-specific technique, the string teacher must decide upon a string pedagogical approach or method to use. The choice of a pedagogical approach should provide support in such a way that students can understand the underlying concepts and can process shifting knowledge. For instance, instructional scaffolding can provide a process to systematically teach the content knowledge for shifting. Considering the complexity of shifting, scaffolding is an instructional strategy that can be used to build on students' prior knowledge and help them internalize new concepts.

Instructional scaffolding is a process whereby the teacher systematically plans instructional strategies for students to learn the new skills. Additionally, the new concepts and skills are broken into chunks that provide a concrete structure for the teacher and students. We developed the following scaffolding process based on PCK for shifting: pre-shifting exercises, shifting exercises without shifting, shifting exercises with shifting, and shifting in context. The shifting exercises described below were adapted from a variety of well-known pedagogical approaches including (but not limited to) Rolland et al. (1986) and Hamann and Gillespie (2013), and online sources such as Laird (2011a, 2011b), String Pedagogy Notebook (Hopkins 2015), and The Violin Site (Belknap 2015).

### **Pre-Shifting Exercises**

The pre-shifting exercises described below are intended to help students relax their left hands and thumbs while shifting, and to reinforce that the finger should travel smoothly and

lightly on the string during the shift. Additionally, the exercises can promote light touch and help to eliminate squeezing and tension. The teacher should ensure that students' left hands are relaxed and that the finger used for shifting is traveling smoothly and lightly on the string during the shift. The pre-shifting exercises below are not listed in sequential order. However, we begin with string polishing, which we consider the easiest pre-shifting exercise.

*String polishing* (non-bowed exercise). Polish the D-string by lightly touching the string with third finger and shuttling from first position to high positions without using the bow. Repeat the exercise using the 4, 2, and 1 finger on all strings so that the correct actions can be reinforced in a variety of angles and levels, no matter the finger or string.

*Pizzicato shuttles* (non-bowed exercise). Have the student hold the instrument with the correct left hand shape. The student plucks a lower string with the pinky on the left hand while moving the arm up and down the fingerboard freely. The plucking motion encourages the student to keep the hand shape while also promoting flexibility and dexterity.

*Ghosts* (bowed exercise). Have the students lightly touch the string with one finger and slide up and down the string to create ghostly sounds (i.e., hearing the various harmonics as the student slides). This motion helps the student practice loose, relaxed shifting motions while touching, but not pressing, the string.

*In the groove* (non-bowed exercise). Have the student place all four fingers between two strings and slide up and down the string. Placing all four fingers down allows the student to maintain a natural, relaxed left hand shape without any "fly-away" fingers that might cause undue tension or reduce dexterity. Placing the fingers between two strings helps the student to shift freely while touching the strings without having to press down.

*Paper slides* (non-bowed exercise). Place a piece of tissue paper below the strings and have students slide up and down the fingerboard with their fingers on the tissue paper. The tissue creates a substance that makes sliding easier, since it lacks the stickiness of skin, sweat, and natural oil that the finger might have.

*Sirens* (bowed exercise).. Have the student hold the instrument with the correct posture. The student places one finger firmly on one string and slides up and down the string while bowing to create the siren sound. This activity works from the previous one by reinforcing the correct, relaxed sliding motion of the arm but now with more finger weight into the string. Students who demonstrate extra tension at this stage may be invited to revisit previous steps.

*Matching natural harmonics* (bowed exercise). Have students move their hands up and down the strings to find as many harmonics as possible. This activity helps the students use their ear to find notes, such as they will do when eventually sliding to any note. However, since harmonics only sound when the finger is in the right place, they act as an excellent “target” for young players who might otherwise not know how to adjust an out-of-tune note.

*Sliding Geminiani chords* (bowed exercise). Place first finger on the top string, second finger on next, third finger on next and fourth finger on the bottom string and slide whole hand up and down the string. (Hamann & Gillespie, 2013, p. 94). Placing a finger on each subsequent string helps the student to create a round hand shape while practicing arm motions for shifting.

### **Position Exercises without Shifting**

The purpose of stationary position exercises in various positions is to accustom the left hand and fingers to play in higher positions, without adding the complexity of shifting. The main goal is to provide the feel of the positions in the hand and fingers, and to practice the whole-step and half-step finger patterns in upper positions where the spacing is smaller than in first position.



The student's thumb and hand should be relaxed and the left-hand shape should remain the same throughout the exercises.

Instructional strategies in this phase will help students understand the concept of playing in various positions. An instructional video such as that by Scott Laird (2011a) would be an excellent tool for introducing position work. Laird (2011a) demonstrates the familiar tune "Here Comes the Bride" to find third position by ear. The exercise can be modified to introduce lower string instruments to higher positions.

Additional instructional strategies include practicing familiar tunes or scales in a higher position that do not require shifting. After students understand the concept of whole-step and half-step finger patterns in upper positions the students would practice three-note melodies in various positions (without shifting). For instance, have the students shift up a whole step or half step and play three note melodies again. Violins and violas would use the finger patterns 1-2-3 or 2-3-4 using the correct whole-step and half-step patterns. Cellos would use the finger patterns 1-3-4 or 1-2-4 using the correct whole-step and half-step patterns. Basses would need to shift and use the finger pattern of 1-1-2 or 1-1-4 using the correct and half-step patterns.

Position exercises in heterogeneous classes can be tricky due to the varying strings and subsequent position requirements on different instruments. However, helping students develop an understanding of string instrument "geography" can encourage them to try multiple avenues for playing any particular series of notes. For example, violin and viola students can practice the one octave D-major in third position, while the cellos practice the scale in fourth position using extensions and harmonics. The basses would play in first position and shift on the G string for C# and D. It is critical that the students are taught the correct finger pattern on each string

(succession of half and whole steps) in order for the students to successfully perform the correct notes.

### **Shifting Exercises with Shifting**

As students begin to practice shifting exercises, they need to practice maintaining their left-hand shape and relax their left hands and thumbs while shifting. Additional exercises should promote the finger to travel smoothly and lightly on the string during the shift, which will help to eliminate squeezing and tension. The teacher should watch the students and make sure their left hands are relaxed and that the finger used for shifting is traveling smoothly and lightly on the string during the shift.

Instructional scaffolds in this phase would include shifting exercises with familiar tunes or scales that can be played by rote. An educational video such as Laird (2011b) can be used for understanding and practicing the mechanics of shifting from first position to a higher position. Additional strategies would include teaching shifts in well-known tunes played on one string versus string crossings. For example, Old Macdonald and Twinkle Little Star can be played on one string with shifts. Additionally, one-finger melodies and one-finger scales can be introduced (1-1-1-1) to practice the shifting motion.

Likewise, the expansion of two-octave scales can be introduced to further refine and develop the shifting motion. In the heterogeneous class, a two-octave major scale with or without shifting can help reinforce shifting skills. For instance, the violins can play the entire D-major scale in third position without shifting and a G-major scale with shifting. The violas can play the entire G-major scale in third position without shifting and a D-major scale and can practice shifting into third position for the two-octave D-major scale (shift into third position on the D string). The cellos can remain in first position for the D-major scale and shift into fourth position

for the G-major scale and bass students can play the lower octave of the G-scale in first position and will need to shift multiple times for the second octave. The basses can repeat the one-octave D-major scale, which requires shifting into a higher position on the G-string.

### **Shifting in Context: Exercises and String Repertoire**

Lastly, shifting opportunities within the context of music reading are introduced. Shifting in context can be complex and difficult due to the fact that students must integrate music reading knowledge and shifting knowledge simultaneously. The teacher can purposefully select repertoire and method books that expose students to shifting into higher positions. Method books can help students reinforce key shifting concepts learned previously. Exercises and method books can provide a smooth transition from rote exercises and scales. For example, a variety of well-known warm-ups include (but are not limited to) *Daily Warm-Ups* (Allen 1993); *Essential Technique for Strings* (Allen et al. 2004). Additionally, the careful selection of music repertoire will provide opportunities for students to practice and develop the shifting motion. Expressive music repertoire with slower tempos and shifting opportunities (such as *American Princess*, Phillips 2007) can be used to help introduce shifting in a musical context.

### **Conclusion**

String educators need both subject-matter content knowledge and pedagogical knowledge to teach string-specific content. Therefore, simply knowing string-specific content may not be sufficient for *teaching* string-specific content, and simply knowing a few “tricks” may not be sufficient for teaching them correctly. String teachers need to be able to choose instructional strategies that will transform pedagogical content knowledge in such a way that students can understand and apply the knowledge through performance. As Shulman (1987) stated, “the key to distinguishing the knowledge base of teaching lies at the intersection of content and pedagogy,

in the capacity to transform the content knowledge . . . into forms that are pedagogically powerful and yet adaptive” (p. 15).

## References

- Allen, Michael. "Daily Warm-Ups for Strings Orchestra." *Wisconsin: Hal Leonard Publishing* (1993).
- Allen, Michael, Robert Gillespie, and Pamela Tellejohn Hayes. *Essential technique for strings: intermediate technique studies*. Hal Leonard Corporation, 1997.
- Belknap, Monte. (2015). The violin site. <http://www.theviolinsite.com>
- Geringer, John M., Michael L. Allen, and Rebecca B. MacLeod. "Initial movement and continuity in vibrato among high school and university string players." *Journal of Research in Music Education* 53, no. 3 (2005): 248-259. doi:10.2307/3598683
- Gillespie, R. "Identification of factors for evaluating upper string instrument spiccato bowing and a comparison of two instructional approaches." *Dialogue in Instrumental Music Education* 12, no. 1 (1988): 21-33.
- Gillespie, Robert. "Factors for evaluating upper string instrument vibrato and a comparison of two instructional approaches." *Dialogue in Instrumental Education* 17 (1993): 37-51.
- Grossman, Pamela L. *The making of a teacher: Teacher knowledge and teacher education*. Teachers College Press, 1990.
- Hamann, Donald L., and Robert Gillespie. *Strategies for teaching strings: Building a successful string and orchestra program*. (3<sup>rd</sup> ed.). Oxford University Press, USA, 2013.
- Hopkins, Michael. (2015). String pedagogy notebook. <http://www.stringtechnique.com>

Laird, Scott. "3rd Position on the Violin". Filmed [April 20 2011a].

<https://www.youtube.com/watch?v=L4b3WekvL0U&t=14s>

Laird, Scott. "Shifting to 3rd Position on Violin". Filmed [April 20 2011b].

<https://www.youtube.com/watch?v=-SSCtXMNh0I>

Phillips, Bob. *American princess*. Highland Etling Publishing, 2007.

Rolland, Paul, M. Mutchler, and F. Hellebrandt. "The teaching of action in string playing." *Urbana* 51 (1986): 61801.

Shulman, Lee S. "Those who understand: Knowledge growth in teaching." *Educational researcher* 15, no. 2 (1986): 4-14. doi:10.3102/0013189X015002004

Shulman, Lee. "Knowledge and teaching: Foundations of the new reform." *Harvard educational review* 57, no. 1 (1987): 1-23. doi:10.17763/haer.57.1.j463w79r56455411

Sievers, Beth A. "A survey of string teachers' opinions regarding the teaching of violin/viola shifting." PhD diss., 2005. Available from ProQuest Dissertations and Theses database. (UMI No. 3203281)