a journal of the Society for Music Theory

Volume 15, Number 3, August 2009

Reflections on and Some Recommendations for Visually Impaired Students

David Pacun

Received December 2008

---

[1] Whatever one's training in music theory, little in our course work or early teaching prepares us to work with students who are visually impaired. Sadly, our journals, until now at least, have been remarkably silent on even the most basic questions regarding how Braille notation works and the resources that are available for both student and professor. Failure in these areas points to an even deeper chasm in our pedagogical knowledge—namely that we have no precise understanding of what visually impaired students really need to know and the best way(s) to teach it. The purpose of this paper, however, is not to fill these voids with certainty, but merely to begin the discussion from the very limited perspective of my own experience. Here, then, I will address four main issues: (1) mainstreaming versus individualized instruction, (2) preliminary planning, (3) classroom planning and pedagogy, and (4) working with Braille notation. A short conclusion follows.

Basic Questions: Mainstreaming vs. Individual Instruction

[2] It is useful to begin discussion with the legal end of matters. According to federal law, the instructor or program must provide "reasonable accommodations" for any documented disabilities. The legislation itself, however, left the meaning of "reasonable accommodations" purposefully vague, thus allowing for varying interpretations. In the case of teaching visually impaired students, it *might* arguably entail as little as locating a copy of the textbook in an alternative format (Braille or audio recording), and perhaps enlisting an aid to help the student transcribe his or her homework. With just these seemingly slight accommodations, a visually impaired student may excel in the classroom, provided that the professor consistently provides clear instruction. Additional alterations to course content or teaching style may not be necessary, allowing the visually impaired student to learn right along with everyone else in the class. Based upon my own experience, this approach—in effect mainstreaming—is likely to work best with students already familiar with theory and aural skills, and who have considerable experience with Braille notation.

[3] At the opposite end of the accommodation spectrum, one can eschew classroom mainstreaming entirely and provide individual instruction, thus tailoring the content to the student's needs and learning style. According to those that have taught visually impaired students in this way, they typically deliver course content orally in one-on-one sessions, and have the student reproduce by singing or playing what is notated in the traditional theory course.(1) Focusing on practical application, this approach can avoid the complications that arise from having to locate an appropriate text, change class format, and transcribe music, charts, handouts, and examples into Braille.

[4] Pure mainstreaming and individualized instruction represent two extremes, and it is likely that most instructors will mix

aspects of the two. For instance, mainstreaming often requires some sort of individual instruction, especially during the critical starting phase of the semester. Conversely, most visually impaired students will benefit from classroom experience, even if that experience is more social than instructional. While not all student information is correct, students often learn through conversation and discussion with each other, and removing a visually impaired student from this information stream may diminish the effectiveness of the instruction, resulting in a less well-prepared student.

Preliminary Planning

[5] Ultimately, the exact approach one takes to educating a visually impaired music student will be influenced by many broad factors including curriculum and program, student level, available support services, and individual faculty interest. For instance, the requirements and needs of a music major in a liberal arts program will most likely differ from those of a performance major at a conservatory. As a more concrete example, Ithaca College currently has a blind student enrolled in music education and here the requirements are quite stringent, as well as mandated by New York State. This student will—among other things—have to briefly student teach in a sighted classroom, so our theory program is responsible for teaching him sighted notation (a method for accomplishing this is given below). Where program and curriculum needs are intensive and the demands upon the student great, it may be best to assemble an ad hoc committee to monitor and assess the student's progress, as well as ensure that faculty communicate with one another regarding problems that arise.[(2)]

[6] Perhaps more importantly, one should thoroughly assess the student's level of basic musicianship prior to his or her enrolling in theory and sight-singing classes. While many visually impaired student musicians possess absolute pitch, they might be deficient in other areas, including rhythm and fundamentals (scales, chords, etc.). These sorts of deficiencies are hardly uncommon among sighted students, and most instructors will have a plethora of methods and tricks available to address them. Our lack of knowledge of how to deal with the challenges presented by student disabilities can hinder our own capacity to solve such problems effectively and quickly. And even though a disability may not cause the deficiency, it may mask the deficiency in unfamiliar ways.

[7] By meeting with academic support services, instructors can see the available resources first-hand and gauge the extent to which these can be easily accessed and utilized. Most colleges and universities have funding available for readers and aids, but where funds are limited creative approaches, like drawing upon work-study students or utilizing a portion of a graduate assistantship for basic tutoring and/or support, may be necessary. The more securely this can be put into place before classes begin, the better. A more critical point for music theory instruction concerns computer technology. In particular, Brailling music requires special software, and compatibility between programs (such as Sibelius and Dancing Dots) is essential if one requires a quick turnaround of assignments and/or musical excerpts. It is vital that instructors (as well as support services) research the finer points of each program and their ability to integrate into a reasonably full and complete package. While certain programs can transform scanned music into Braille, this technology is not always accurate, and moreover it is time consuming for the user. Conversion programs that enable direct Braille printing from Sibelius are, in my experience, well worth the cost. In any case, the instructor, student, and aid should each take ample time to make test runs, sending music files between the respective users. If one gets a late start, a third or more of the semester may evaporate before the student gains access to vital handouts, supplemental material, and assignments in their proper form.

[8] As a final part of the preliminary planning process, it is important to honestly assess one's own interest in this sort of educational experiment—for that is what it is—as well as one's willingness to sacrifice the energy necessary to make it succeed.[(3)] Educating visually impaired students is a rewarding enterprise, but it is time consuming and therefore vital to recognize (as best as possible) one's own limitations before committing whole-heartedly to the process. One must remember that many sighted students will also require additional help and instruction, and that these students have an equal right to time, attention, and energy in whatever capacity is typical for a particular program.

Classroom Planning and Pedagogy

[9] For those who do decide to mainstream visually impaired students, **Figure 1** provides more practical and direct advice concerning classroom planning and pedagogy. Much of the advice offered here should be self explanatory, but it is useful to emphasize several key points. Above all, prepare as much as possible in advance and plan to spend a fair amount of extra time with the student, especially in the early stages of the course. Think carefully about the physical layout of the classroom (in all likelihood, a large, flat desk will be necessary), and describe this to the student at the start of the semester. Always vocalize everything that you do as you are doing it: for instance you must say out loud, "I'm writing the bass line on the board with the figures underneath." Be prepared, moreover, to call out octave designations, rhythms, and metric placement

for all pitches.

[10] Since much of traditional theory relies upon visual cues—for instance, Roman numerals align with bass notes—I have had to think creatively about how to give my student a sense of sighted notation. One thing I have tried with success is a large staff made from Velcro strips—rough for the lines, soft for the spaces (see **Photo 1**). Velcro dots function as stick-on pitches, and although the Velcro staff is noisy to use, my student was able to take pitch-pattern dictation and to keep track of bass lines or cantus firmi using this staff. In order to provide my current student with a better sense of phrase form and harmonic rhythm and progression, I constructed a masking tape grid on his desk. The raised edges of the tape enables the student to move his hand through the stream of measures as the phrase proceedes. In this way, the grid also functions as a memory aid for the overall structure. Also, my student will sometimes tap out an example's rhythms within the given measures.)

[11] Rhythmic deficiencies prove especially hard for visually impaired students, as the larger flow of the music is difficult to grasp whether in Braille or through pure aural analysis. Here, I have experimented—somewhat successfully, but not entirely so—with Lego-block patterns. As shown in **Photo 2**, each Lego-block construction represents a common one-beat rhythm pattern, enabling the student to follow the flow of beats, not simply individual rhythms, and to physically locate or lock into specific points in the phrase or measure. (**Example 1** provides a notated realization of the Lego patterns given in Photo 2.)

[12] Dictation creates all manner of complications, beginning with whether and how the student will notate the result, and, in the case of exams, how that result will be transmitted to the instructor for grading. Modern laptops do come with Braille pads at the bottom—the appropriate Braille cells come up through holes in the pad—and I strongly recommended that the student use these to take dictation. Where this isn't available or when it proves too cumbersome, visually impaired students can take dictation directly into music processing programs such as Sibelius, modifying the playback mechanism to state the pitch name and not the pitch sound. (Headphones or earplugs eliminate any wayward sound.) Alternatively, a student may notate pitches and rhythms in word-processing files using some sort of improvised notational short hand (i.e., q = quarter, e = eighth, etc.). One drawback to this method, however, is that it often produces a stream of pitches and rhythms that can be difficult to follow. Hence, it can be helpful to place each new measure on a new line, or to construct grids using Excel (wherein columns = beats, rows = measures) so that both you and the student can keep track of where they are in the music. Finally, once a dictation exercise is completed and the result written on the board, you may need to "sing/speak" back the actual rhythmic note values (in some sort of abbreviated fashion) along with the rhythm/melody itself. (For instance: "quar[ter]-quar-eigh-eigh-quar.")

[13] Whatever solutions you choose for dictation, homework, and the like, it is important to recognize that many have the unfortunate effect of subverting a critical aspect of the exercise—namely its circularity. For instance, in the typical dictation exercise, a student first processes the music in terms of function (scale degree, Roman numeral, metric placement and duration), then notates, or attempts to notate, the result. During subsequent hearings, students must make adjustments to their initial attempts. This forces them to re-read and re-assemble what they first sketched. Thus sighted students not only process the music in terms of function, and concretely realize this function in notation; they also weigh their notated version against the music as it sounds again.

[14] Prior to computer technology, visually impaired students working in Braille would use a "slate and stylus" (a metal grid with templates for manually punching out the Braille cells) to notate their realization (whether for dictation or homework). Just like sighted students, they would notate/create the music notation (here in Braille) by and for themselves, and would be forced to weigh their initial sketch against the actual music as it sounded again. With recent technology, it is now the computer that creates the notation (whether the Braille cells at the bottom of the keypad, the visual notation in Sibelius, or a shorthand version in a word file) and reproduces it for the student. The visually impaired student is "short changed" the act of writing, the act of notating, the act of Brailling.

[15] A similar situation may also arise if one relies too heavily upon readers and transcribers to aid in a student's homework. While transcribers and readers—some of whom may volunteer their time—provide a vital service in bridging (if not plugging) the many gaps that will inevitably arise in this sort of pedagogical enterprise, personal experience has taught me that knowledgeable readers and transcribers—exactly the kind necessary to transmit a musical score or analytic chart to the student, or to complete a homework assignment—can unwittingly interfere in the student's educational experience. For instance, a transcriber may read notes on a score in such a way as to pre-group them into chords ("the right hand has G-D

and B, then F♯-D and A”), or, in the case of dictation, “smooth over” the rough edges regarding notational inaccuracies and practices. In a rhythmic dictation, the observation that “measure two has all eighth notes” means something different in $\frac{4}{4}$ and $\frac{9}{8}$, or better $\frac{3}{4}$ and $\frac{6}{8}$. In the first case, there is the numerical difference between eight eighth notes and nine eighth notes, in the second between three groups of two eighths and two groups of three. What is lost in the latter case is the vital sense of the beat as a quarter versus a beat as a dotted quarter.

Braille: Advantages and Caveats

[16] Ultimately, much of what you do and how you do it will depend on whether or not you plan to work with Braille music notation. Strangely, the issues surrounding the use of Braille notation are now more complex than they were when Louise Braille developed his system almost two hundred years ago. Owing to advances in computer technology, perhaps as few as 20% of young students have reasonable familiarity with Braille notation, and familiarity is far from fluency. Although blind music students often possess remarkable basic skills, they may be unable to read music, and more importantly learn music by themselves, having previously either copied recorded versions or had the music played to them by instructors. In this regard, visually impaired students are similar to those sighted students who likewise read music poorly—for instance vocalists who rely upon memorization, or hardcore Suzuki string students for whom the “dot on the middle line” is “1 on the A string.”

[17] If you have worked with such students, you have some idea of the problem that you face. Still, the student’s visual disability may compound the problem, and adding Braille notation to the equation will add yet another layer of complication to the process. To the extent that collegiate programs take music literacy seriously, the question of whether or not “to Braille” is not really a question at all—although given the nature of a program, one may, for perfectly understandable reasons, decide against it.[4] Still, as Stephanie Pieck—a blind composer, pianist and teacher who graduated from Ithaca College in 1994—argued in a recent email:

> I'm passionate about music, and also about Braille literacy. We wouldn't ever consider letting our sighted kids get through school, whether it's general education or specialized music studies, being unable to read and write independently. Tapes are wonderful, computers are great, but there's no substitute for the ability to read and write in Braille.[5]

[18] Before sending gloms of scores in the direction of the novice reader, it is helpful to know a bit about the nature and structure of Braille music notation. (See **Figure 2**.) Invented in 1829, Braille notation was unified only in 1954 and has undergone revision since. The basics are this: each Braille cell contains six dots.[6] The top four are used to represent pitch, the bottom two rhythm. Importantly, each rhythmic dot pattern possesses two possible realizations: which is which will be obvious from context (for instance in a bar of $\frac{4}{4}$ there can be only two half notes). The meter and key signature are given at the start and are thereafter assumed. Braille utilizes no clefs, only octave designations, and blank cells indicate bar lines.

[19] While the full system is complex and proves difficult to read via touch, the dots are plainly visible and the system can be quickly memorized by the sighted reader: the thirds-cycle C, E, G, and B form L’s that progress counterclockwise around the upper four dots:

C= ┐ E= ┌ G= └ B= ┘

“D” is then diagonal *Down*, “A” is diagonal up (*Ascending*), and “F” is all *Four* dots. The dual rhythms are organized in pairs with the same last denominator: 1/**<u>2</u>** and 1/3**<u>2</u>**, 1/**<u>4</u>** and 1/6**<u>4</u>**, 1/**<u>8</u>** and 1/12**<u>8</u>**.

[20] While Braille notation is capable of expressing most everything in a sighted score, it is an additive and linear system, one meant more for learning from or memorizing from than for direct reading in performance. (This is obviously true for instrumentalists who must use their hand to play.) Apart from rhythm and pitch, all else—dots, borrowed divisions, slurs, articulations, dynamics, etc.—requires additional cells, and these can accrue logarithmically across the page. In addition, while multiple parts can be notated in quasi-aligned formats, any score of more than one part “requires assembly” as well as a degree of memorization on the part of the student.[7] Interestingly, inner voices in keyboard-style chords are notated using a quasi-figured bass notation, which shows the intervals above the left-hand bass note, and intervals below the right-hand melody. Highlighting the outer voices, this system actually correlates nicely with much in present day theory pedagogy.

[21] Yet another concern stems from how Braille is actually taught: since rhythm and pitch combine into single cells, instruction in Braille notation begins with music in uniform note values: first only eighth notes; then quarters, then halves, etc. Such rhythmic uniformity does not interface well with college-level sight-singing and fundamentals textbooks, most of

which begin with diverse rhythms within different metric structures. What is basic in beginning sighted pedagogy will be complex and confusing for the beginning Braille reader. In all, the point is simple: even a short 8-bar keyboard excerpt can bury novice readers in a mass of linear information. They may be unable to quickly assemble and thereby recreate the "music" from the steam of cells placed in front of them.

[22] Thus if one decides to incorporate Braille notation as part of the theory instruction, one must make several adjustments. First, simplify scores as much as possible, especially for in-class examples and exams. Notation programs such as Sibelius and Finale can allow you to manage the level of notational complexity as well as control the introduction of "ancillary" signs—slurs, dynamics etc.—on a systematic basis. Second, if possible begin with species counterpoint: the all-whole note, followed by the wholes-and-halves framework provides a very convenient entry point into Braille notation (including assembling multi-part scores) and into theory. Third, teach techniques that will enable the student to learn and digest musical scores quickly. Here, theory proves directly relevant: motivic and harmonic principles and concepts provide precise methods for students to "chunk" scores into constituent parts. Hence, theory becomes a means to learn music, not simply analyze it.

Conclusions: Turning the Tables

[23] Teaching visually impaired students is a time consuming and complex process. And while it has personal rewards, it may benefit your class in other ways. One great positive outcome of working with visually impaired students is that it forces one to rethink the "how and why" of conventional theory pedagogy, and hence to consider how music theory might be taught differently. For instance, much can be gained by flipping pedagogical questions around: instead of asking how we might teach "sighted" techniques to visually impaired students, consider asking how "visually impaired pedagogy" might be useful for sighted students. Why not, for instance, force all the students in class to memorize excerpts? In the process, the students might discover that motivic, harmonic, and voice leading structures serve admirably as memory aids, as ways to simplify the process. In this way, analysis and practical application, perhaps even performance, become, if not one in the same, then at least something a bit closer.

[24] In the end, however, the above ideas and thoughts represent personal observations, not time-honored and fully tested truths. Others who have taught visually impaired students may have different yet equally useful and valid ideas. As noted at the start of the paper, we have no precise understanding of what visually impaired students really need to know and the best way(s) to teach it. In this regard, the real purpose of this paper is far simpler than the "facts" contained within it. If upon further consideration and investigation it proves that the ideas and thoughts presented here are incorrect or inaccurate, so be it. The essential point is that, in a field as large and as expansive as music theory has become, discussion of and research into these issues is long overdue.

David Pacun
Ithaca College
dpacun@ithaca.edu

Footnotes

1. Arnie Cox, message of August 12, 2008.
Return to text

2. On a more practical level, blind students require a fair amount of time and practice to learn the physical layout of a campus and the individual buildings. In certain cases a reduced schedule, or specialized schedule (for instance so that classes in the same building are back-to-back) may be warranted.
Return to text

3. Far too often, responsibility for this type of intense and time-consuming instruction falls to untenured junior faculty, or teaching assistants—those who typically face strong pressures to publish, present at conferences, and engage in extensive committee work and/or advising. This situation is unfair to both the instructor—who is being pulled in too many directions at once to be entirely effective—and to the student who will likely feel short-changed. This situation can only be rectified through strong moral leadership at the highest administrative levels.
Return to text

4. I should state here that Ithaca College's own commitment to Braille literacy requires substantial funding and time: we employ a work-study student to input scores into Sibelius, and have purchased the program necessary to convert these directly into Braille notation. In a pinch, I can and will hand notate Braille scores with a slate and stylus. (For manual Brailling devices, see Perkins School for the Blind: http://support.perkins.org.)
Return to text

5. Personal email of September 18, 2008.
Return to text

6. Braille dots are numbered in two columns (left, then right) 1–6. For instance, the Braille cell for an eighth note C would be referred to as dots 1-4-5.
Return to text

7. See Shersten Johnson, "Notational Systems and Conceptualizing Music: A Case Study of Print and Braille Notation." *Music Theory Online* 15.3 and 15.4 (August 2009).
Return to text

Prepared by Sean Atkinson, Cara Stroud, and Tahirih Motazedian, Editorial Assistants