



“Teaching Blind”: Methods for Teaching Music Theory to Visually Impaired Students

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Received December 2008

[1] Imagine this—it’s a week before the beginning of the school year and you’ve just been told that a blind student will be in your sophomore theory class. What do you do? In late August 2007, I found myself in this situation. This essay is intended to enable someone in a similar situation to save some time in investigating available technology and in devising methodology. It will focus on teaching blind students, but resources for the visually impaired in general are also included.

[2] According to my university’s Academic Resource Center, we are required by the 1973 Rehabilitation Act and the 1990 Americans with Disabilities Act to provide reasonable accommodations for students with disabilities.

A reasonable accommodation is a modification to a non-essential aspect of a course, program, service or facility which does not pose and [sic] undue burden and which enables a qualified student with a disability to have adequate opportunity to participate and to demonstrate his or her ability.⁽¹⁾

[3] Some schools will provide extensive aid for the purpose of accommodating visually impaired students in the music classroom, including spending a significant amount of money converting textbooks to Braille. My university did not do this, but it did provide excellent peer tutors and guides.

[4] The more time one has to prepare for a visually impaired student, the better. Hardware, software, Brailled textbooks and scores need to be ordered ahead of time, tutors need to be found, and teaching aids may need to be constructed. I have found that the more one can think through what the student needs and the best method for providing it, the more successful the teaching experience will be. Whether or not the student comes armed with the latest technology, the teacher should be ready to spend extra time, either preparing class materials or working together one-on-one.

[5] Because my student had transferred from another local school, she did not come through our first-year theory class, which would have given me a lot more notice, and I could have drawn upon the experience of my colleagues. Our Academic Resource Center also did not have the experience to help me with any specific music-related accommodations.⁽²⁾ It turned out that the most information came from colleagues who had encountered the same circumstances. I had sent a message to the SMT-talk discussion group that expressed my predicament:

I’d . . . welcome any suggestions you might have for helping a blind student in the second year of a two-year theory sequence. She’s a transfer student, so I have little information about how things were done at her

previous school (more discussion with her is in order). Somehow I need to find ways to do written and aural skills with her. We do have a resource center to help out, but they apparently haven't had to deal with a blind musician before. Any advice would be greatly appreciated!

Many responses advised me about types of available resources, and about issues that might arise.⁽³⁾ This information enabled me to seek out further resources, some of which are contained in Figures 1–4 below.

[6] The following discussion will focus on the individual skills usually incorporated into a core music theory curriculum, how I dealt with them with my particular student, and other methods to deal with them.

Dictation

[7] At first, I gave dictation quizzes to my blind student privately or had her tutor administer them, since she did not have a laptop or other electronic note taker (see **Figure 2**) to use in class. Had I known about it at the time, a slate and stylus (**Figure 1**, item 1) could have worked as well. I would play the examples, she would tell me the answers, and I would notate them. After she acquired her laptop, we worked out a method by which she took the quizzes with the rest of the class. She does not read Braille music notation,⁽⁴⁾ so we used a system by which she notated the pitches and rhythms separately in two different lines. Here is an example of a melodic dictation passage:

af, bf, cn ef fn ef, cn af gf fn af df bf af gn ef dn ef fn ef af cn bn cn af⁽⁵⁾

hheeeq.eqqeqeqeqeqeqeqecheeh⁽⁶⁾

The student has absolute pitch (as do many blind musicians), but her memory for extended melodic or harmonic passages still needed training.

[8] Students who do read and write Braille music notation can use the software listed in **Figure 3** to notate their dictation exercises and print them out or email them as is, if the teacher also reads Braille music, or in notation for the sighted.

Part-writing and other Written Exercises

[9] My student did have some piano training, and so was able to compose and play partwriting exercises, which her theory tutor, a music therapy major, wrote down. A student who can read Braille music can work independently. The software options in Figure 3 that translate between Finale and Sibelius and Braille music enable students to receive assignments from the teacher, and return them in print or electronic format. This can work for exams as well.

Analysis

[10] Analytical activities were done with my student in private meetings. I would play the music on the piano or from a recording, and the student would tell me her analysis, which I notated. This required playing works in short chunks, the length of which were determined by trial and error. In class, I made sure to name all notes and chords carefully whenever working at the board and playing examples. A student who can read Braille music can borrow scores. The National Library Service for the Blind and Physically Handicapped (NLS) has over 30,000 items in Braille, large-print, etc. Items may be checked out for three month loans with a three month renewal.⁽⁷⁾ Some scores may be available as electronic files.⁽⁸⁾ According to the NLS website,

A growing number of Braille music scores is [sic] available in an electronic format via the Internet. To access these music files, eligible program users must first receive a username and password from either their cooperating network library or the NLS Music Section. When these are received, the music files can be browsed online or downloaded for later reading or embossing. A list of available titles is on the web at www.loc.gov/nls/Braille/musiclst.html, and there is a link to each music file from its record in the online catalog <nls.catalog.loc.gov>.

Thus a teacher with some lead time can check the availability of a particular score, and have the student order it in advance.

Sightreading

[11] For beginning students who do not read Braille music, the low-tech solutions given in Figure 1 (items 2–7) are possible.⁽⁹⁾ For those who do read Braille music, sightreading is possible for piano or voice, or other instruments that can be

played with one hand.⁽¹⁰⁾ However, I was not able to work out a method of having my student experience advanced unprepared melodic or rhythmic exercises,⁽¹¹⁾ and so I had to omit that aspect from her training.⁽¹²⁾

Prepared Singing/Playing

[12] For a student who reads Braille music, the software options in Figure 3 can enable the teacher to provide notated examples for learning. For the student who does not read Braille music, recordings remain the best method for hearing and learning compositions.

Composition

[13] Other than the items in Figure 3 that facilitate notation and aural playback, the sequencing program Cakewalk has been mentioned (Cazden 2007, Aikin 2000) as the most accessible to the visually impaired. For recording compositions, one can use hardware-based tools, such as the Kurzweil K2600, the E-mu Proteus, the Yamaha DM-1000 mixer, the Eventide DSP 7000, and the iZ Technology Radar multitrack digital audio recorder. The industry standard ProTools recording software has gone in and out of compatibility with screen readers for the visually impaired (Cazden 2007).⁽¹³⁾

Conducting

[14] No special aids were necessary in this activity when teaching my blind student, but I would have her put her hand over mine while I demonstrated various beat patterns. The student, a talented singer, had already taken a course in choral conducting, and her teacher noted to me that the spatial locations of beats were difficult for her to learn, since she had never been able to watch a conductor in action. I noticed that the student needed correction occasionally, since she would not always move her hand across her body for beat patterns that required it, and at times her pattern was too small.

[15] The following figures contain resources that can be used in teaching visually impaired students. **Figure 1** contains the least expensive resources. The slate and stylus (a nineteenth-century invention by Louis Braille and a colleague), involves a frame for embossing paper with raised Braille dots. The other items would be suitable for a student who does not read Braille music. The user who reported on item 2, the white board, noted that it was not very efficient for ledger lines.⁽¹⁴⁾

Figure 1. Low-Tech Music Notation Aids

Braille slate and stylus⁽¹⁵⁾

White board with raised lines and magnets for notes, accidentals, etc.

Velcro staff with Velcro noteheads, etc.

Aluminum foil on a clipboard

Elastic bands (used to make the shapes of staves, clefs, and notes) (Barss 1999, 16)

Puff paint (Mazur 2004, 9)

Pipercleaners (Mazur 2004, 9)

[16] In **Figure 2**, I describe some electronic devices available for students to use in class. Many of these are expensive to purchase. One of the problems faced by my blind student was that her family had not been able to provide a variety of technology for her, so she depended on the state to order hardware and software. The process of ordering and receiving aids through the State of Louisiana has seemed lengthy. During fall 2007 my student awaited a laptop computer, which only arrived at the end of the semester, too late for us to take advantage of it. Therefore she had only a tape recorder to take notes in class. This year she requested Goodfeel software to translate between Braille music and traditional notation for sighted musicians (see Figure 3). It took several months to arrive as well.

Figure 2. Hardware (aside from laptop or desktop computers)

Braille note taker—Electronic Braille note takers are small, portable devices with Braille keyboards for entering information. They use a speech synthesizer or Braille display for output. The user enters the information on the Braille keyboard and has the option of transferring it to a larger computer with more memory, reviewing it using the built in speech synthesizer or Braille display, or printing it on a Braille or ink printer.⁽¹⁶⁾

Braille personal digital assistants (PDAs)—Can take notes, play music, read books, type papers, use the Internet or sync up to a personal computer to download e-mails or other files. May use refreshable Braille display or Perkins-style keyboard.

Perkins Braille—Braille typewriter (new model released 2008)⁽¹⁷⁾

Refreshable Braille display—Electro-mechanical device that reads a computer screen and translates it into Braille by raising dots through holes in a flat surface.

[17] **Figure 3** contains a list of software that will mediate between Braille music notation and popular music notation programs such as Finale and Sibelius.⁽¹⁸⁾ Most of these programs do not work with Apple operating systems. In addition, compatibility issues have been raised by some users, so one should make sure to order the software in plenty of time for the kinks to be ironed out before the programs are needed in class.

Figure 3. Software that Translates between Braille Music and Notation for the Sighted

Braille Music Editor—According to their website, BME “recognises all chief Braille music signs; allows [one] to listen [to] edited music; allows [one] to save Braille music files in proprietary format, convert them into scores through a plug-in for Finale; and vice versa allows [one] to convert music files realized with Finale, to Braille.”⁽¹⁹⁾

Dancing Dots—Maker of products for visually impaired musicians and people who work with them⁽²⁰⁾

Finale—Music notation program for sighted users.

Goodfeel—Translates files from Finale, Sibelius, and other music notation programs to Braille via MusicXML notation interchange format. According to the website, also allows visually impaired musicians to read and write musical scores, and to create print and equivalent Braille transcriptions for collaboration with sighted or visually impaired musicians. It can be integrated with a literary Braille translator “to facilitate transcription of theory or method books that have large blocks of expository text.”⁽²¹⁾

JAWS—Screen reader for visually impaired users

Lime—“Like a child’s version of Finale”⁽²²⁾

Lime Aloud—Lime for visually impaired users

SharpEye—Music reader (optical character recognition) program for scanning music scores (bundled with Toccata and Goodfeel).

Sibelius—Music notation program for sighted users

Sibelius Speaking—Sibelius for visually impaired users; works with JAWS. According to Dancing Dots’ website, Sibelius version 3 is required, “as our Sibelius Speaking scripts do not support Sibelius 4 or 5 and our independent developer has no plans to update Sibelius Speaking to work with later versions of Sibelius. Sibelius Speaking does not work with any version of Sibelius Student Edition.”⁽²³⁾

Toccata—Windows-only program that translates musical notation to Braille. Designed for sighted users, but can be used by visually impaired users with speech synthesizers or refreshable Braille displays. One can enter music into it, use midi or .niff files, or scan music.⁽²⁴⁾

[18] **Figure 4** surveys hardware and software for those who need larger print. Most of these resources are expensive, except the third, which comes with the operating systems mentioned. For more on this subject see [Green 2007](#).

Figure 4. Magnifying Hardware and Software

Video Magnifiers.⁽²⁵⁾

Camera with Zoom Lens

Accessibility wizard in Windows 2000, ME, XP and NT⁽²⁶⁾

[19] Further resources for sight-impaired musicians include organizations such as the Music Education Network for the Visually Impaired (MENVI)⁽²⁷⁾ and National Resource Center for Blind Musicians (NRCBM).⁽²⁸⁾ Some offer courses specifically for college-bound visually impaired students (see [Hessler-Binder 2002](#) and [Smaligo 1998](#)).

[20] So far, this essay has dealt primarily with technical accommodations for visually impaired students. But adaptations in teaching approach must be considered as well. I will only scratch the surface here. As I mentioned earlier, whenever I went to the board to illustrate a concept, I verbally enumerated everything I was writing, and either played it at the piano or sang it. [Kerchner 2004](#), [Mazur 2004](#), and [Siligo 2001](#) have warned that one must also choose one's language carefully in order to be clearly understood by visually impaired students. Engaging auditory and kinesthetic sensory modes is also important ([Mazur 2004](#), 8). For example, although my student could not perform complicated rhythm sightreading exercises with the class, I encouraged her to conduct and pat the steady eighth notes along with the rest of us, so she could hear the rhythms against the metrical backdrop and feel where we were in the bar.

[21] In conclusion, working with visually impaired music students is both a challenging (technologically as well as pedagogically) and stimulating experience. Several colleagues have reported that they permanently changed their teaching techniques for sighted as well as visually impaired students as a result, relying more on aural and kinesthetic experiences. I can only hope that this introduction will enable others to avoid the panic of not knowing what resources are out there to help.

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Footnotes

1. Taken from <http://www.loyno.edu/arc/disability-services-faqs#3>. The phrase “non-essential aspect of a course ...” was confusing to me at first, until our center director explained it. As an example, we would not be required to make an accommodation for a blind student for viewing slides, if it were an essential part of the course.

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2. A call to our largest local university revealed a similar lack of information. This leads me to conclude that the disability services offices of many universities are not well equipped to advise music teachers on how to conduct the practical aspects of their classes with visually impaired students.

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3. I would like to thank the following folks for sharing their experience: Mary Arlin, Anne Bell, Rik Bernards, Jill Brasky, Richmond Browne, Jeffrey Gillespie, Richard Hoffman, Gretchen Horlacher, Shersten Johnson, Ed Latham, Bruce Moser, Jocelyn Neal, David Pacun, Julia Proleiko, David Smooke, David Sommerville, Bruce Quaglia, and Gerald Zaritzky.

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4. Braille music notation is based on the six dots (in two columns of three each) of the Braille alphabet, reinterpreting the top four dots as the note names and the bottom two as rhythmic values. A basic introduction can be found at <http://253.ccarh.org/files/Braillemusicnotation.pdf>. Various companies have products that teach this system. I have not found formal studies, but have heard of anecdotal reports that as few as 20% of visually impaired music students read Braille music. Interestingly, some studies dealing with reading Braille music claim it is easy to learn while others claim it is difficult. My student studied it during the summer of 2008, but did not get far enough to be able to read a piano score.

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5. She used f for flat, s for sharp, and n for natural.

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6. h stands for half note, e for eighths, q for quarters. This exercise was actually in 6/8 meter. The fact that my student notated most of the dotted quarters as half notes indicates her unfamiliarity with standard rhythmic notation.

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7. See <http://nlscatalog.loc.gov/>.

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8. A quick search reveals that these include the Bach chorales and Well-Tempered Clavier, some Mozart, Haydn, and Beethoven piano sonatas, etc.

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9. The need for some method to expose blind students to the shapes of standard notation became clear to me when a discussion with my student revealed that she did not know the symbols for rests. If a teacher were to refer to these symbols in a discussion, this student might well have difficulty understanding the argument.

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10. Since Braille scores present one line at a time, and since one hand is needed to read the notation, generally only one voice can be read at a time. However, some Braille notation for piano uses symbols to indicate either the melody and intervals below it (an alto part) or the bass and intervals above it (the tenor), and so could be used for sightreading two parts, if they can be played by one hand.

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11. I tried speaking rhythm exercises with our rhythm syllables for her to repeat, but her memory for complicated patterns turned out to be limited to one bar at a time, which was not greatly helpful.

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12. As a music therapy major, my student only took one semester of sophomore theory. However, this year she changed her major to vocal performance. This program change requires her to take the fourth semester of music theory, counterpoint, and the Form and Analysis class, as well as a year-long music history survey. Therefore I have told her in the strongest possible terms that she must learn to read Braille music.

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13. A petition web site at www.protoolspetition.org reports that Digidesign, maker of ProTools, is still working on the accessibility issue. A paper by three Czech authors claims to have solved the issue. See <http://www.springerlink.com/content/n37073mj30076824/>.

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14. Personal communication from Bruce Moser, 9/14/08.

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15. My student does not like this method, because one has to write “backwards,” since one is embossing the paper from the back. However, a position paper from the Braille Authority of North America on the use of the slate and stylus refers to “teaching strategies that focus on the forward progression of the writing task.” Apparently “such strategies have demonstrated that the cognitive processes necessary for slate writing do not involve reversals of characters. The instruction to students ‘write first what you read first’ has been found to be useful.”

See <http://www.Brailleauthority.org/The%20Use%20of%20the%20Braille%20Slate%20and%20Stylus.pdf>.

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16. American Federation for the Blind: afb.org

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17. For information on the “next generation” model, see <http://www.perkins.org/nextgeneration/features-benefits.html>. Perky Duck, a computer based Perkins Braille emulator is available from Duxbury Systems, <http://www.duxburysystems.com/products.asp>.

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18. For more on this subject, see Goldstein 2000.

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19. See http://www.dodiesis.com/index.php?q=whatisBME_en.

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20. The company’s web address is <http://www.dancingdots.com/main/index.htm>.

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21. See <http://www.dancingdots.com/main/goodfeel.htm#about>. In spring 2009, my blind student attempted to use the program to translate various Finale files into Braille, but reported that it didn’t work. The cause of the problem was not determined.

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22. Personal communication from Gretchen Horlacher, 10/2/08. More information on the program is available at the Dancing Dots web site.

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23. The web address is <http://www.dancingdots.com/prodesc/SibSpeaking.htm>.

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24. For more information, see <http://members.optusnet.com.au/terryk/toccat.htm>.

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25. For this, and the next option, see <http://afb.org/Section.asp?SectionID=4&TopicID=31&DocumentID=221>.

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26. For this and the next two options, see <http://afb.org/Section.asp?SectionID=4&TopicID=31&DocumentID=1387>.

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27. www.menvi.org

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28. <http://www.blindmusicstudent.org/>

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