PRACTICE REPORT

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A New Synthesis of Sound and Tactile Music Code Instruction:

Implementation Issues of a Pilot Online Braille Music Curriculum

By

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Practice Report

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Employment opportunities for persons who are severely visually impaired (that is, those who are blind or have low vision) are often extremely limited (Crudden, Sansing, & Butler, 2005; Moore, Wolffe, & McDonnall, 2010). Music and music-related careers have served as viable employment for many persons who are blind or visually impaired (Jacko, Cobo, Cobo, Fleming, & Moore, 2010). Given the wide array of issues facing students with visual impairments who want to pursue careers in music and the expanding use of online distance education programs, there is an ongoing need to enhance online training curricula through distance learning.

In order to offer its comprehensive Braille music course to a wider audience not limited by geography, Miami Lighthouse for the Blind and Visually Impaired, Inc., in collaboration with The Carroll Center for the Blind (CCB) in Newton, Massachusetts, debuted a distance learning Braille music curriculum in summer 2013. Using Job Access with Speech (JAWS) keystrokes consisting of the arrow keys with the Insert key on the number pad to simulate Braille dots or cells, this first-of-its-kind online instruction for Braille music, developed over a two-year period by a Miami Lighthouse instructor, makes Braille music notation available to students worldwide. At a time when even the most basic Braille instruction is becoming more elusive and evanescent, students who complete the course are delighted to have access to the same information their sighted music peers have on sheet music.

For musicians who are blind or visually impaired, music scores must be transcribed by knowledgeable Braille transcribers to Braille music notation. Louis Braille included musical notation in his original system; in the early nineteenth century, reading music was as much a part of literacy as any kind of reading, as people made their own music at home using sheet music and instruments. In musical notation, symbols, not letters, represent pitch, duration, key, volume and other elements of critical information.

This article describes how the new distance learning Braille music program serves students and prepares them for further study and careers in the mainstream music industry.

Braille Music: History

Music is highly complex, in a way even more so than mathematics, because it is an art and therefore subject to interpretation. The precise instructions or formula for capturing a composer's intent have been encoded with special notation for more than a thousand years, but along with all this precise notation goes a dizzying array of interpretive signals, ranging from the graphic symbols that indicate volume changes to the words, traditionally Italian, that indicate volume, style and approach. Unfortunately, instruction in music is no longer as common as it once was because of budget and other issues. Students who are blind, because of the lack of support for Braille instruction, have been even more seriously affected by the erosion of music instruction. Development of core curricula for students with blindness or visual impairment tends to strongly focus on functional skills, orientation and mobility, independent living and, finally, career skills (Hatlen, 1996). Though music is undeniably one of the fine arts, music instruction is approached as a career skill by Miami Lighthouse. Miami Lighthouse Better Chance Music Production Program™ alumni have gone on to successful careers across a variety of positions in

the mainstream music industry and to higher education at prestigious music schools such as the Berklee College of Music and the New World School of the Arts.

The use of computers for transcribing Braille began in the early days of computer use, before home PCs had become common (Patrick and Friedman, 1975), and Braille music was included. However, less than 15 percent of printed music has been transcribed into Braille. Blind musicians must either play "by ear" or/and rely on instruction by a sighted musician, and both of those systems are fraught with potential for error and prevent the musician from experiencing the fullness of the composer's intent in the musical score. Braille music has largely fallen by the wayside; it is not regularly taught in schools for the blind. However, the Internet enables blind users (like everyone else) to access music as recorded sound and as printed music scores. Goto, Gotoh, Minamikawa-Tachino, & Tamura, (2007) proposed a transcription system from the MusicXML format to Braille music notation using a structural model of Braille music notation, which resulted in Braille scores that met an international standard. This fairly recent breakthrough makes it possible to provide Braille music scores on the Internet to people who are blind or visually impaired (Goto et al., 2007).

Cattaneo et al. (2008) found evidence that blind students can employ different cognitive mechanisms compared to sighted students, some of which are apparently compensatory. Relying on a different mode of perceptual input, students who are blind learning Braille music, for example, bring a differently organized mental process to their studies than a sighted music student would. However, blind people can have "plastic functional reorganization mechanisms" that enable them to learn material just as thoroughly as sighted individuals, and often very effectively (Cattaneo, et al., 2008). While Hatlen and Curry (1987) recommended instruction in

programs designed specifically for blind and visually impaired students (i.e. not mainstreaming), the students at the Miami Lighthouse have traditionally learned alongside sighted peers, as both groups tend to benefit from this approach in various ways. However, the needs of Braille readers definitely are different, and a new approach was needed in an era when the focus on Braille instruction has significantly diminished.

Miami Lighthouse has pioneered instruction in music for blind and visually impaired clients with great success (Jacko, et al., 2010). Musical Instrument Digital Interface (MIDI) software, a cornerstone technology of the Miami Lighthouse Better Chance Music Production Program™ is widely used in the music industry to encode information about pitch and volume, but not interpretive remarks and symbols. MIDI has been accessible to blind users since screen-reading technology became part of commonly used operating systems. The Better Chance Music Production Program™ at Miami Lighthouse uses MIDI with JAWS to instruct students in music production and composition techniques, and with this training, alumni of the program have found a variety of jobs in the mainstream music industry, as sound engineers, musicians, composers, and more (Jacko, et al., 2010).

Braille music notation is not the only tactile approach to learning music; for example, the Weasel Project, a system developed in the U.K. With Weasel, a keypad is combined with a PVC tactile overlay to deliver information about a piece of music (Challis, 2006). The new Miami Lighthouse course combines screen-reading technology with tactile instruction, as students use their own Braille readers at home to read (instead of just listening to) what they are studying. They read the actual scores, transcribed into Braille, not substitutions for them.

"For music production and consumption systems, the 'workaround' nature of traditional accessibility enhancements could be replaced by a naturally available transformation and representation feature" (Crombie, Lenoir, & McKenzie, 2003). The Internet and browser-based learning tools provide just this sort of "transformation and representation" for Braille music. While Crombie warns, "With every modification of the models that are used for music analysis, representation and synthesis, additional effort has to be invested to synchronize the consumption and production opportunities for print impaired users with those of the average end-user." The Miami Lighthouse, an agency serving persons who are blind and one that provides services to approximately ten thousand people of all ages each year, is accustomed to making curricula accessible to meet those needs.

Braille Music at Miami Lighthouse

The Miami Lighthouse course features 26 lessons in Braille music notation aimed at "Contracted" Braille readers, with a glossary written by a Certified Music Instructor. Each interactive lesson is designed to be completed in 45 minutes, with activities for practice and review between lessons. "Creating accessible media requires a whole range of processing stages and involves many different people and tasks." (Crombie, Lenoir, & McKenzie, 2004). The authors found this to be very true; the Assistive Technology Distance Learning Instructor at the Miami Lighthouse developed the program in conjunction with a music education and curriculum specialist from Miami-Dade County Public Schools. The author of the copyrighted Braille Music Curriculum is a prolific composer who has been totally blind since 1972. He also wrote, developed and has been teaching the Miami Lighthouse Braille music curriculum to students on site at Miami Lighthouse since 2010 and is one of only a score of Braille music experts in the

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United States who have earned the Library of Congress music Braille transcription certification. He personally reads and evaluates the between lesson assessments.

The pilot program consisted of four students enrolled (two females and two males) from Florida, Virginia and Massachusetts who range in age from 14 to 50. The group included two Caucasians, one African American and one Hispanic. All expressed a desire to become more proficient with reading Braille music. Four more students are currently enrolled. The program is the only distance-learning Braille music instruction using screen reading software such as JAWS both for reading the lessons and completing the homework in Braille music.

Because of the Braille reading proficiency required, the course is designed to be taken by students in their late teens and by adults. Not all people who are blind or visually impaired are able to learn to read Braille music (Crombie, Dijkstra, Schut, & Lindsay, 2002). A "Contracted" Braille reader has command of 23 words that are contracted to single characters; this goes beyond rudimentary Braille and is a prerequisite for participation in the online course.

Students also need to have access to and knowledge of the use of Braille notetaking hardware and software. For the Braille notetaker or Braille display, the online course teacher provides the students with the Braille format lessons as a .zip file, upon request. The student can use his/her Braille notetaker to access the web page the same way as one uses a PC. The web pages are exclusive to screen readers, so all the Braille dots are analog Braille, with Arabic numbers. When it comes to the writing assignments, the students use Perky Duck or Duxbury Braille Translation software and submit them as attachments via e-mail.

A number of authors, including Jacko, et al. (2010); Krolick (1996); and Smaligo (1998), have noted that the challenges of teaching music to blind students can seem insurmountable to a sighted teacher: "Blind students are a low-incidence factor in the overall population; in an entire career a music teacher may encounter such a student only once or twice. Overwhelmed by what seems to be required, but unable to locate suitable resources, the teacher may still try to do the right thing despite having virtually no tools" (Smaligo, 1998). The Miami Lighthouse course offers a way for motivated older teens and adults to receive personalized instruction and work at their own pace.

The program became available just over one year ago. Miami Lighthouse is tracking the completion rates and will follow up with all participants to help determine how the program has affected their success as musicians, if they choose music as a career path. The following are excerpts from interviews with students who completed the program:

"I am very happy with my results, and I am confident that my time spent in this course was and is a wise investment. The lessons were thoughtfully planned and easy to follow. It was a pleasure completing the assignments because they helped me to fully understand the content and enabled me to gain some valuable transferable skills that will be beneficial to me in the future….Thanks a million to [program director] Mr. Choi for his vision and his passion. I personally witnessed a teacher who is very excited about teaching Braille music. He is very willing to answer any question, play or sing a note or measure, and he will even write a score to illustrate the example. I will recommend this course to anyone: you will never regret it. My proof is this: I am now able to use my Braille music hymn book more effectively

whereas prior to this course I would skip a hymn because I did not recognize the symbol. This course has made a difference.

Lorna, Florida; began in July 2013, graduated in January 2014

Jin Choi adds: "Lorna diligently studied during the past six months. She not only passed the exams but also submitted four required recording assignments using BrailleNote's recording feature, and three writing assignments with Perky Duck."

And another student responded: "I liked the course. I was able to take the lessons successfully using JAWS and the Braille sheet music I embossed. I think it helped me and it was a good thing to learn before going to Berklee for college. I've already recommended the course to some blind friends of mine."

Kristin, Massachusetts; began in January 2014, graduated in June 2014

Choi adds: "Kristin diligently studied during the past four months. She not only took four exams but also submitted three required recording assignments, and one writing assignment, using Perky Duck. She accomplished her goal through this online course."

While these comments reflect anecdotal evidence that the program is effective, additional empirical research is needed to evaluate its impact on employment outcomes and career advancement for persons who are blind.

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