

Music Technology Opportunities for Students with Exceptionalities



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Music Technology Opportunities for Students with Exceptionalities

Abstract

This presentation examines opportunities for accommodation and inclusion of students with exceptionalities in the music classroom through utilization of music technology. Visually Impaired, Physically Handicapped, and Hearing Impaired are areas of exceptionality that will be considered. Software, examples of ongoing research, current projects, and various commissions in action will be explored as part of the presentation. New Controllers will be video explained.

Presentation

Envision Possibilities! Bias Dictates Actions! Look to our students' exceptionalities as opportunities for advancement. Many students with disabilities on college campuses do not realize their potential, as they are never seen. At times we tend to focus of the generic status quo we see each day. Music Technology assists in providing opportunities for music participation, whether on campus, or through distance education programs. Music Technology is doing wonders for individuals with exceptionalities and providing opportunities for performance and participation in both distance education and classroom music activities.

Physically Handicapped

Opening Performance

Charlotte White, St Roses College, Stroud, plays using a MIDI sensor activated by her head as well as two switches with her thumbs. Her Bach performance is at: <http://www.youtube.com/watch?v=sNBhIZCL54Q> Her other interests include mouth painting, and photography. She has a goal to work as a music therapist upon graduation. <http://www.drakemusicproject.org/makepage.asp?page=5acharlotte>

“Charlotte’s £25k skydive,” reported by Katie Matthews, 26 Nov 2007. “Eighteen-year-old Drake musician Charlotte White has raised a massive £25,000 in a sponsored skydive for Drake Music and St Rose’s School, Stroud..Charlotte originally set herself a target of £3,000. “I’m now up to £25,000 which is pretty incredible – people’s generosity has been unbelievable,” she said. “The best bit about the jump was when the parachute came up after the free fall. We were just floating around in the air – a sort of out of this world experience. It felt like I was on another planet, completely detached. The worst bit was when we were about to jump out of the plane, that was terrifying!” During the tandem jump Charlotte dislocated her shoulder. “But,” she says, “I would definitely do it again.”

Charlotte White update <http://www.drakemusic.org/experience/charlotte-white-bronze-arts-award/>

The Drake Music Project

Based in England, The Drake Music Project provides opportunities for disabled musicians of all ages and abilities to explore, compose, and perform music. Using

specialist and adapted music technology, Drake Music enables disabled children and adults who are unable to play conventional musical instruments to compose and perform. The project illustrates possibilities for disabled and non-disabled artists to be able to perform together. <http://www.drakemusicscotland.org>

Recent Technology Controllers

Brainfingers, Hands-Free Computer Control. “Transforms brain and body electrical potentials from the forehead into hands-free computer controls which can be customized to each individual's needs. Controls most AAC software, educational software and video game Brainfingers can give a voice to people who are non-verbal or who have limited expressive language, and may be appropriate for individuals with severe and multiple disabilities. Our clients have included individuals with Cerebral Palsy (CP), Lou Gehrig's Disease(ALS/MND), Spinal Muscular Atrophy (SMA), Muscular Dystrophy (MD), Trumatic Brain Injury (TBI), and Spinal Cord Injury (SCI)” Information quoted from <http://www.brainfingers.com> Great site to visit to learn more.

Open-Up Music –Disabled music youth orchestra—United Kingdom. visit to view super musicians using technology in action. <http://openupmusic.org>

Drake Digital Music Orchestra. Very important video to view to note use of electronic music technology with students.
https://video.search.yahoo.com/search/video;_ylt=AwrBTzpVC2dYJ7gAdBRXNyoA;_ylu=X3oDMTEybTBwZ3AwBGNvbG8DYmYxBHBvcwMxBHZ0aWQDQjMyMjFfMQRzZWMDc2M-?p=Drake+Digital+Music+Orchestra&fr=aaplw#id=2&vid=d713d53c06c1ab581e01470d5af03d76&action=view

ParaOrchestra. The first professional music orchestra for persons with disabilities. Based in United Kingdom. <http://paraorchestra.com>

The EyeHarp: An Eye Tracking Based Musical Instrument. By Zacharias Vamvakousis. Fee and open source project to allow people with paralysis to play music.
<https://www.youtube.com/watch?v=XyU8FyB0nZ8>

Magic Flute-Sax. Karin plays the virtual instrument illustrating its usage.
<https://www.youtube.com/watch?v=tICPTmz1gfo>

Beamz Interactive Music System. A versatile music instrument that lets anyone make music. Can be utilized for special education, senior or physically disabled.
<http://www.spectronics.com.au/product/beamz-interactive-music-system/>

Skoog—a tactile music instrument that can be used for disabled to make music.
<http://skoogmusic.com>

Yamaha WX-5 Wind Controller.
Breath Therapy and Musical Breathing Exercises (respiratory therapy) developed by Ruud van der Wel— Netherlands, utilize the WX-5 to assist Spinal Muscular Atrophy, and Muscular Dystrophy therapy. Band and chamber performance with the WX-5 is also a

possibility, as transcriptions to accommodate timbres will allow parts to be covered as well as providing participation. Online teaching suggestions, MIDI, and audio file accompaniments are available on a dedicated page <http://www.mybreathmymusic.com/>

Eye-tracking Camera and Software

By using an eye-tracking camera and adaptive software as a controller, performance-opportunities exist for totally paralyzed individuals to play, compose and perform. Note this performance with the EyeHarp using a 60euros DIY distance tracker: PS3 modified camera with 2 infrared light sources along with the ITU Gazetracker open source software. <https://www.youtube.com/watch?v=dBvWW-emzGM>

MaKey MaKey—neat adaptable controller that you can use to attach to anything to control musical sounds. This includes everything from gummy worms, to pizz. <https://www.youtube.com/watch?v=wkPt9MYqDW0>

Mogees musical controllers. allow for use of any device to serve as a music controller. <https://www.youtube.com/channel/UCjVMZp2NSy0lCHBdej99Bjw>

Korfg--iKaossilator synthesizer can be used as a app for working with the iPhone and programmed to produce music compositions. <http://www.korg.com/us/products/software/ikaossilator/>

Deaf/Hard-of-Hearing

Cochlear Implant A stellar new direction for deaf /hh allow hearing of speech and perhaps eventual hearing of "full spectrum" music. The cochlear implant consists of a processor worn outside the ear. The processor converts audio streams from the MP3 player (as well as ambient sounds and human speech) into digital data. The data then goes to another chip, implanted in a person's skull, which translates the data into electrical impulses.

The electrical impulses are then passed down an electrode, which stimulates a nerve that makes the brain create music. It stimulates the nerve in the same way the nerve is stimulated in people with hearing. The implant system effectively bypasses the damaged tissue. Present directions and research are oriented towards sophisticating the implant system for music.

MP3 player for Deaf/hh

Sandy Mintz, an audiologist with medical designer Advanced Biois, who is a person who lost her hearing about 10 years ago is trying to develop a wireless MP3 system so the deaf can enjoy music. She indicates, "the trick now is to optimize the system for music. Getting the pitch and frequency of music is difficult". "You have to fine tune it." Wireless is also a challenge. One idea is to link the external ear piece with the MP3 player through Blue tooth. So far, the results are promising, and Samsung is seeking FDA approval.

Blind/Visually Impaired

What Is JAWS?

* JAWS for Windows is a powerful accessibility solution that reads information on your screen using synthesized speech. JAWS provides many useful commands that make it easier to use programs, edit documents, and read Web pages. With a refreshable Braille display device, JAWS can also provide Braille output in addition to, or instead of, speech. An array of versatile features and customizable options lets you tailor JAWS for your individual needs and preferences.

Music Transcribing Software

This software allows transcription from MIDI, scanned music, and compositions created in Sibelius, Sonar, Lime, Toccata, and Finale into Musical Braille. Files created can also be transferred to tactile Braille keyboards for reading in formats such as Bar-Over-Bar (similar to reading grandstaff music with bass and treble clefs).

Software Titles

*Lime Aloud works together with the JAWS for Windows screen reader software. With Lime Aloud, you can navigate through a musical score using standard cursor keys. Your PC plays each note or chord and verbally describes related annotations such as accents, staccato marks, lyrics, and ties via the JAWS screen reader software.

*CakeTalking customizes the JAWS for Windows screen reader so blind users can audio screen read the SONAR software.

*JSonar is a set of JAWS scripts that enables users of this audio screen reader to use Sonar professional music recording software.

*Toccata (notation and import software) imports MIDI, MUSIC XML, and NIFF (Notation Interchange File Format) as well as functioning independently as a notation editor. Exports in Braille for printer, to Toccata notation files, and to tactile Braille display devices.

*SharpEye is page-scanning software.

*Lime a music editor that has been used for many years for Braille translation.

*Goodfeel 3 is a Braille translator.

*XML provides a common denominator for interaction between Braille conversion programs. .

*Goodfeel allows a non-specialist to function as a braille music transcriber. Using mainstream music scanning and editing software, print notation files can be entered into

*Goodfeel which automatically translates the print information into music braille.

*Sibelius Speaking delivers the power and flexibility of Sibelius, to the blind user.

Sibelius Speaking combines a set of sophisticated scripts for the JAWS for Windows screen reader.

Quick Suggestions

*If anticipating a blind or visually impaired student in your department, provide JAWS in some manner for inclusion on a department computer. Other assistive software and hardware mentioned above will be helpful also. Navigation of the net or music associated software can then be done on campus if assignments are required.

*Check out and enable adaptive and assistive aspects of the computers student may use when on campus. Be aware of and turn on your PC or MAC speech reproduction or

screen-magnification accessories (On PC, under Accessories/Accessibility note the Magnifier, Narrator, and On-Screen Keyboard).

*Provide a student helper, or some type of network to assist with brailing music if a blind or visually impaired student uses this as part of assignments or performance. Student volunteers or yourself can quickly braille music for visually impaired music students.

*Use Smart Music to help in part identification and learning, by extracting part from score so student can work separately on the part.

*MIDI vocal or instrumental parts and emphasize individual's part either with timbre or dynamic contrast and save. . This allows the individual part to be heard in relation to ensemble wither vocal or instrumental.

*Have a chorus member record the student's part with lyrics and convert to mp3 or other formats so the part can be learned outside of choral organization using iPods or mp3 players.

*Challenge The trick now is to optimize the cochlear input system for music. It works well with speech. Getting the pitch and frequency of music is difficult. "You have to fine tune it," Wireless is also a challenge. One idea is to link the external ear piece with the mp3 player through Bluetooth

Assistive software on your computer Mac and PC

*SubRosaSoft's [Macnifier](#) displays a magnified portion of your screen in a separate window. Originally designed as a helper application to assist the visually impaired - it has become an ideal tool for Mac graphic design professionals who need pixel perfect placement and control Download free!

http://www.subrosasoft.com/OSXSoftware/index.php?main_page=product_info&product_s_id=15:b7299e702910988d2f5aaaffd440558a

*iChat and iSight are video conferencing solution with performance and clarity good enough for you to communicate using sign language over the Internet. A high quality video is produced that is good enough to clearly see the finger and hand movements of the person with whom you are communicating.

<http://www.apple.com/accessibility/hearing/>

*Speech Recognition & Talking Alerts: Speakable items let's you command and control the computer using your voice, without requiring you to train the computer. You can use commands to open and close programs, navigate the menu bar, switch between programs, control application-specific items, to enter keyboard shortcuts and speak front window controls such as check box names, radio button names, list items and buttons.

The talking alerts feature gives voice to alert and dialog windows by verbally identifying the application and reciting the contents of its dialog box.

<http://www.apple.com/accessibility/physical/>

Mac--Apple Accessibility <http://www.apple.com/accessibility/>

*VoiceOver included with Tiger. For those with vision disabilities a built-in screen reader that provides keyboard control of the computer, enhanced screen magnification options, and spoken English descriptions of what's on the screen. VoiceOver enables many users with special needs to work collaboratively with other Mac users and use a Macintosh without assistance <http://www.apple.com/accessibility/voiceover/>

PC

*Accessories Accessibility Wizard allows you to customize your computer to your visual, hearing, and utilize Magnifier, Narrator, and Onscreen keyboard.

Research Resources

Physically Handicapped

*Adaptive Controllers for Music including musical instruments GOOD ClickToGo products <http://www.click2go.ie/>

*ADAPTIVE USE OF INSTRUMENTS Good Video--computer access playing <http://www.deeplisting.org/site/adaptiveuse/media>
<http://www.youtube.com/watch?v=ABqABv7MnmM&eurl=http://www.deeplisting.org/site/adaptiveuse/media>

*Drake Music Project <http://www.drakemusicproject.org/makepage.asp?page=1> includes cello video presented.

*Headbangers . <http://www.s-t.com/daily/12-02/12-28-02/a06sr042.htm> group singing with switches MOVIE at <http://www.switchintime.com/HBCNN.mov>

*Adaptive Use Musical Instrument <http://adamglazier.blogspot.com/2008/03/adaptive-use-instruments-project.html> Includes good video demonstration

*E-scape and feedback <http://www.drakemusicproject.org/makepage.asp?page=4d-es-feedback>

*New York StateArts Standards Alternate Assessment Standards for Students with Severe Disabilities <http://www.emsc.nysed.gov/ciai/arts/artstand/artstand.html>

*Super Switch Ensemble. <http://switchintime.com/SSE.html> Access to music for Mac computers. Super Switch Ensemble enables groups of students with mixed abilities to play together in a cooperative setting; each individual working at his/her own level while contributing to the overall performance. Can use IntelliKeys keyboard to communicate if there are problems with regular keyboards.

<http://store.cambiumlearning.com/ProductPage.aspx?parentId=074003237&functionID=009000008&site=itc>

Deaf/Hard-of-Hearing

*Dance techniques for Hard of Hearing <http://depts.gallaudet.edu/dance/techniques.html>
 The Gallaudet dancer are well known for their quality. This site illustrates information about developing dance for Deaf/hh.

*BREAKING DOWN SOUNDS <http://web.mit.edu/newsoffice/2002/hearing-0313.html>
 Synopsis of research direction in developing comprehensive hearing of music sounds through implants.

*hearingimpaired.net Blogs and information about hearing impaired and products for their assistance. <http://www.hearingimpaired.net/welcome.html>

*Hearing Loss Web. <http://www.hearinglossweb.com/tech/tech.htm> information concerning technology and hearing loss. Good information.

*Advanced Bionics <http://www.cochlearimplant.com/index.cfm?langid=1> Strong information on cochlear implants, digital hearing aids and their usage.

*Deaf and Music <http://deafness.about.com/cs/educationgeneral/a/deafmusic.htm>
Information about deafness and learning music with reference to many individuals who have accomplished despite their disability.

*Deaf Education programs at Michigan State University. Well developed program with information for both hh/deaf and teachers/professionals. <http://ed-web3.educ.msu.edu/deafed/>

*TEACHING INSTRUMENTAL MUSIC TO DEAF AND HARD OF HEARING STUDENTS Phillip M. Hash University of Illinois at Urbana/Champaign, September 2003. Good Research Study
<http://www.stthomas.edu/rimeonline/vol1/hash1.htm>

*Scholarly Research Article on Hearing Impaired.
<http://scholar.google.com/scholar?hl=en&lr=&ie=ISO-8859-1&q=+music+and+hearing+impaired+research&btnG=Search>

*Developing Hearing Aid algorithms and background for digital hearing aids. Protocols, iMac and Yamaha AW4416 aid in developing testing advanced signal processing features to individualize in hearing aids.
<http://www.yamaha.com/yamahavg/CDA/ContentDetail/PressReleaseDetail/0,,CNTID%253D20751%2526CTID%253D%2526CNTYP%253DNEWS%2526RLTID%253D,00.html> For optimum results and to see if the hearing algorithm is working a sound field that would present competing sounds (maskers) from 'all around' the listener – much as you would have in a real environment is needed.
<http://www.yamaha.com/yamahavg/CDA/ContentDetail/ModelSeriesDetail/0,,CNTID%25253D2204%252526CTID%25253D,00.html> The Yamaha AW4416 16-Track, 44 Channel Digital Audio Workstation is utilized for this task.

Blind/Visually Impaired

Recording for the Blind & Dyslexic® Groves Dictionary files for speech reader
http://www.rfbd.org/membership_1.htm <http://www.rfbd.org/index.htm>

Sibelius 3 and Sibelius Speaking can be utilized

<http://www.dancingdots.com/support/supportsibspeaking3.htm> This software will not work with Sibelius 5 and earlier forms of JAWS must be used for the program to be interpreted in aural speech.

Dancing Dots,

Demo of Goodfeel <http://www.dancingdots.com/main/goodfeel.htm>

Braille Music Instruction and Repertoire

- [An Introduction to Music for the Blind Student, A Course in Braille Music Reading](http://www.dancingdots.com/prodesc/currdet.htm) <http://www.dancingdots.com/prodesc/currdet.htm>

- [An Introduction to Piano for the Blind Student, A Course in Braille Music Reading](http://www.dancingdots.com/prodesc/intromusicpiano.htm) <http://www.dancingdots.com/prodesc/intromusicpiano.htm>
- [Who's Afraid of Braille Music: handbook for parents, teachers & students](http://www.dancingdots.com/prodesc/whosafraid.htm) <http://www.dancingdots.com/prodesc/whosafraid.htm>
- Creative Ensembles for Beginning Musicians by Stephanie Pieck [Jazz and Contemporary Chord Symbol Reading for the Blind Pianist](http://www.dancingdots.com/prodesc/jazzchords.htm) <http://www.dancingdots.com/prodesc/jazzchords.htm>

[TACK-TILES: learning system for braille](http://www.dancingdots.com/prodesc/tacktile.htm)

<http://www.dancingdots.com/prodesc/tacktile.htm>

*Assistive Technology, a generic term that includes assistive, adaptive, and rehabilitative devices and the process used in selecting, locating, and using them. (From Wikipedia)

http://en.wikipedia.org/wiki/Assistive_technology

Opus Technology Products. <http://www.opustec.com/products.html> Good location source of information about Braille Music resources including Braille music transcription programs and Braille music translator.

*Lavelle School for the Blind Helpful Links.

http://www.lavelleschool.org/text/helpful_links.asp A great source of reference information including American Printing House AFB Press etc. Good for looking up materials, information and services.

*Music and Visually Impaired Children

http://www.rnib.org.uk/xpedio/groups/public/documents/visugate/public_musicvi.hcsp
Excellent pamphlet concerning including music in the schooling of children.

*Music education for the visually impaired.

http://www.rnib.org.uk/xpedio/groups/public/documents/visugate/public_museduvi.hcsp
A compendium of articles from Braille Music magazine, with supplementary material

*Perkins School for the Blind. <http://www.perkins.org/> Information and resources from a highly respected School for the Blind.

*Researchers working to make better music for hearing-impaired people MIT research concerning music and speech. <http://web.mit.edu/newsoffice/2002/hearing-0313.html>

*Sigma Alpha Iota information page. <http://www.sai-national.org/phil/vislres.html>
Resources for musicians with special needs. Great source of information.

*RISE <http://www.learnwithrise.com/english/risenews.htm> Information pdfs on ways visually impaired can function in society.

*Wisconsin Education Association Council. Special Education Inclusion.

<http://www.weac.org/resource/june96/speced.htm> Information on Inclusion of students in the classroom. Well defined with support resources.

*Center for Disabilities list of organization addresses. California State University Northridge <http://letsgoexpo.com/expo/index.cfm?EID=80000093&p=2> Good source of organizations dealing with access, adaptive, and assistive technology.

*JAWS software for Windows.

http://www.freedomscientific.com/fs_products/JAWS_HQ.asp

*Kristi Brown LeAnn Denney. The University of Tennessee April 4, 1997 Music Use in Elementary and Middle School Classrooms for the Deaf

<http://www.deafed.net/PublishedDocs/sub/970723b.htm> Research Study on usage of music in classrooms for the deaf.

*Sonic Innovations. <http://www.sonici.com/> Information on hearing aids and usage.

Technology Center at Indiana University Bloomington and IUPUI. A Great source of college services for students at their schools. Included Vision, Hearing, Learning, Mobility, Hardware, and Software.

<http://www.indiana.edu/~iuadapts/services/web-accessibility/resources.html>

*APH Products-Studio Recorder http://www.aph.org/products/sr_bro.html Studio Recorder™ contains many features that make recording, editing, and proofreading audio books easy. Speed up playback with no pitch distortion. Features: Three levels of phrase detection, Index tone generation and removal, Instant open on large files, Instant cut, copy, paste, and delete, Intercom functionality, Simple user interface, Accessible to blind and visually impaired user, Multiple user marks and notes, External controller support.

*SharpEye Music Reader is widely regarded as one of the most accurate music scanning programs available today. SharpEye 2 saves your scans of sheet music as MusicXML files so you can import them into [Finale](#), Sibelius, MuseBook Score, or any other product that reads MusicXML

<http://store.recordare.com/sharpeye2.html>

*Dolet for Sibelius. <http://store.recordare.com/dolet3sib.html> Plugin that allows music to be transported between pieces of software.

*Adaptive Use Music Instrument Demo Video.

<http://www.youtube.com/watch?v=ABqABv7MnmM&url=http://www.deeplisting.org/site/adaptiveuse/media>

*Jsonar Project. http://www.jsonar.org/drupal/download_cwmc Access to Jsonar script that allows JAWS to read Sonar as audio speech.

*Opus Technology Products, <http://www.opustec.com/products.html> Produce Toccata, A full-featured Braille music translator OpusDots Lite. A braille music transcription program. Bettye Krolick How to read musical Braille.

*Hearing Loss Web. A good page for information including definitions of various disabilities and terms that aid in clarity of understanding problems of exceptionalities. <http://www.hearinglossweb.com/tech/tech.htm>

*MIT Researchers working for for making better music for hearing-impaired people. <http://web.mit.edu/newsoffice/2002/hearing-0313.html> Good article on current directions in technology.

*Adaptive Technology for the Internet: Making Electronic Resources Accessible to All Barbara T. Mates, Doug Wakefield, and Judith M. Dixon (Paperback - Jan 2000) Super book on the information illustrated in this presentation. Highly valuable for reference. http://www.amazon.com/Adaptive-Technology-Internet-Electronic-Accessible/dp/0838907520/ref=sr_1_3?ie=UTF8&s=books&qid=1198114580&sr=1-3

*RFB&D Recording for the Blind & Dyslexic (RFB&D), a national nonprofit, volunteer organization, has been the leading producer of accessible audiobooks for students with disabilities such as visual impairment or dyslexia that make reading standard print difficult or impossible. With titles available in every subject area and grade level, RFB&D's digitally recorded textbooks help students challenged by the printed page. <http://www.rfb.org/>

*Boston University Office of Disability Services. Good listing of organizations and resources for individuals with exceptionalities. <http://www.bu.edu/disability/resources/alternative.html>

*Trinity College of Music "Case Studies Making music technology accessible for visually impaired students" An examination of direction to provide music technology for disability college students in the United Kingdom. Examines costs, software to acquire and limitations and outcomes. http://www.bicpa.ac.uk/casestudies/making_music_tech_accessible.html

*Deaf Net..Vital page for information, research, current thought. Managed by high level professionals. <http://www.deafed.net/>

*GOOD Music Software information. Includes most titles with demographic information on all of them . <http://ace.acadiau.ca/score/others.htm>

*LIMECEMERL Sound Group. Devices and software for handicapped individuals. Includes LIME software. <http://www.cerlsoundgroup.org/main.html>

*LIME Information and Download Site <http://www.cerlsoundgroup.org/cgi-bin/Lime/Windows.html>

*Do Visually Impaired Children have Special Musical Abilities? RNIB Research and Information of Blind and Partially Sighted People.

http://www.rnib.org.uk/xpedio/groups/public/documents/visugate/public_musicvi.hcsp#P10_964

*Software strikes a chord for disabled students

University project enables physically challenged students to create music using technology Very important as it has the video demonstrating the Physical Access Technology Software http://www.eschoolnews.com/news/top-news/news-by-subject/curriculum/?i=50703;_hbguid=96411d65-0eec-4278-b39d-bdb1bddf9b92

*Music Education Network for the Visually Impaired. A good source of major contributors and leaders in the field. E-mail addresses and resources are mentioned <http://menvi.org/>

*Switch in Time Jon Adams <http://www.shanj.org/News/concert.htm>
<http://www.switchintime.com/>

*My breath my music <http://www.mybreathmymusic.com/download.htm> songs and song backgrounds that can be utilized with a windcontoller

*E-scape and feedback <http://www.drakemusicproject.org/makepage.asp?page=4d-es-feedback>

*E-scape in action <http://www.drakemusicproject.org/makepage.asp?page=4des-us-norsid2005> Tutorial for E-scape at <http://www.drakemusicproject.org/downloads/E-Scape%20tour.d>

Assistive software and components on your computer

On Mac

*ERICA communication system using an eye tracking camera.

<http://www.eyeresponse.com/Disabilities/> The eye-tracking camera and software may be installed on your existing Windows or Macintosh based computer. With this you have the ability to control your computer with your eyes.

Apple Resources available via computer

<http://www.apple.com/education/special-education/>

*iOS for Learning/Litracy, Vision, Hearing, Physical and Motor Skills

<http://www.apple.com/education/special-education/ios/>

*OSX Special Education. <http://www.apple.com/education/special-education/osx/>

*OSX Learning page with above dissability links.

<http://www.apple.com/education/special-education/osx/#learning>

****New Controller Devices for Computer Utilization**

*Korg padKontrol <http://www.korg.com/us/products/computergear/padkontrol/>

*Skoog <http://skoogmusic.com> A square box that controls the iPad for music with special learners

*Soundbeam <http://www.soundbeam.co.uk>

*Alphasphere <http://www.alphasphere.com> <http://www.alphasphere.com/news/jason-hou-rips-it-up-on-the-sphere/> Video with this. Can use as a controller.

*Korg NanoPad Slim-line controller.

<http://www.korg.com/us/products/computergear/nanopad2/>

*Beamz iPad app <https://itunes.apple.com/au/app/beamz/id671194210?mt=8> controller with iPad

*iKaossilator <http://www.korg.com/us/products/software/ikaossilator/> Palm synth from Korg...use with special needs students

*Soundbeam switches <http://www.soundbeam.co.uk> SOUNDBEAM IS AN AWARD-WINNING 'TOUCH FREE' DEVICE WHICH USES SENSOR TECHNOLOGY TO TRANSLATE BODY MOVEMENT INTO MUSIC AND SOUND. IT GIVES CHILDREN AND ADULTS THE OPPORTUNITY, REGARDLESS OF THEIR IMPAIRMENTS OR DISABILITY, TO PLAY MUSIC.

*Akai LPD8 midi controller <http://www.akaipro.com/product/lpd8>

*Beamz <http://www.thebeamz.com> Great site for work with autism, therapy and rehab. Good pictures and some videos. Can be used by visually impaired.

*Soundbeam switches <http://www.soundbeam.co.uk>

*Airvox app <http://www.yonac.com/AirVox/> Controller with handgestures and on screen.

*MaKey MaKey <http://makeymakey.com> use everything from fruit to a staircase as a controller.

*Mogees Controller-Transform anything into a musical instrument.

<https://www.kickstarter.com/projects/mogeesplay/mogees>

*Numark Orbit <http://www.numark.com/product/orbit> Controller

*Singing Fingers <https://itunes.apple.com/au/app/beamz/id671194210?mt=8>

**These sources were located through a great online resource Midnight Music. Katie Wardrobe is webmaster and a super contributor to music technology resource location. Visit her at: midnightmusic.com.au

2017 Resources:

*OpenUpMusic-Organization in UK to provide opportunities for performance in Orchestras. <http://openupmusic.org/>

*Paraorchestra in Bristol, England-opportunity for orchestral performance with other members who are disabled. <http://www.paraorchestra.com/>

*Drake Music Scotland <http://www.drakemusicscotland.org> creates opportunities for children and adults with disabilities to learn, compose, and perform music independently. Digital Music Orchestra <https://www.youtube.com/watch?v=P2lnyiOXmUU>

*Accessibility with Windows 10.

<https://www.microsoft.com/enable/products/windows10/default.aspx>

About Dr. Fred Kersten

Dr. Fred Kersten is currently and has been for seven years an Online Graduate Facilitator for Boston University. He works with graduate music education majors around the world who are completing their masters and doctorate degrees in music education.

Fred holds five degrees in music and music education. He received the B.S. and M Mus degrees from Crane School of Music in Potsdam, New York. His M.S. in Elementary Education and Certificate of Advanced Study in School Administration are from SUNY, New Paltz in New York. The Doctorate (D Ed) in music education/administration was awarded by The Pennsylvania State University.

A veteran of public school music teaching in Choral, General and Instrumental areas, Fred has taught music from Nursery, and Kindergarten through Graduate Levels. His doctoral dissertation focused on Music for the Visually Impaired and was developed from his many years of teaching music to students with exceptionalities.

Interest in the recorder as a performing instrument led to study at Indiana University and he authored a book on Teaching Recorder that has been published by NAFME. His performance repertoire includes Bach, Handel, Telemann, and the vast repertoire of classical recorder literature.

His current interests are focused on music technology and his study of classical pipe organ which was his dual major as an undergraduate in addition to clarinet and recorder.

