

KEYBOARD SKILLS

Why Keyboard Skills?

What do Albert Einstein, Neil Armstrong, Condoleezza Rice, and Steven Spielberg have in common? Well, in one way or another, these individuals have made significant contributions in their respective fields. However, you might not know another important link between these highly successful and accomplished people: music. For Albert Einstein, learning to play the violin from an early age had a strong impact on his life as a physicist;^[i] the baritone horn was the instrument of choice for Neil Armstrong in high school; Condoleezza Rice performed Mozart's Piano Concerto in D minor with the Denver Symphony Orchestra at the age of 15;^[ii] and, for Steven Spielberg, music was deep-rooted in his childhood as he practiced the clarinet in grade school and high school.^[iii]

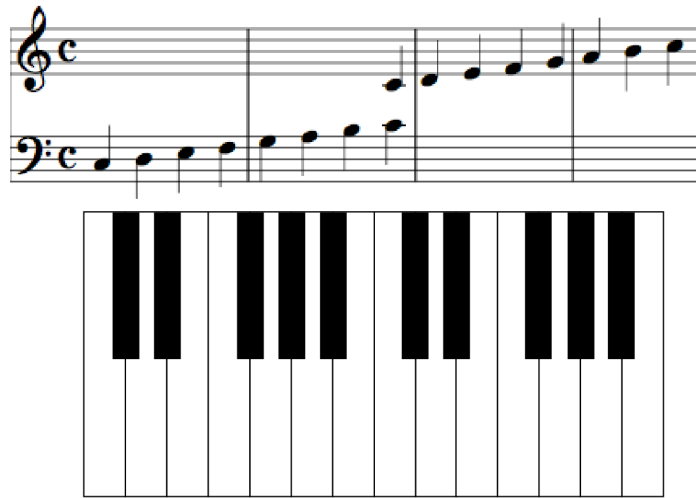
Research in music and music education continues to show that learning a musical instrument during childhood and adolescence has positive lifelong effects.^[iv]

Naturally, as parents and educators, we can't help but wonder, "which instrument would provide the best musical foundation for my child (or student) both in and outside the classroom?" At Juilliard, we strongly believe that the keyboard acts as an entry point for lifelong learning and enjoyment in music. Specifically, the keyboard is the ideal instrument for classroom music due to its easy accessibility and structural design to support the following:

- music theory learning^[v]
- ear training^[vi]
- composition^[vii]
- creativity through improvisation^[viii]
- influence on unique brain development^[ix]
- independent and collaborative learning^[x]

Using keyboards in the music curriculum provides concrete examples of and encourages the immediate comprehension of abstract concepts. Our experience and hands-on work with various kinds of learners have shown that there is no simpler way for students to begin to understand music than to see the relationship between notation and the keys on a keyboard.

Additionally, while instruments such as recorders are traditionally used in the educational environment, keyboards are approachable and playable by students of **all ages**. Not only do keyboards allow them to more easily engage with and explore musical ideas, but they also empower any student to immediately play with a refined tone.



Easy Accessibility

- To play the keyboard, all you need to do is sit and press down on a key. Unlike the flute, the trumpet, or the violin, it does not require delicate muscle control or extensive technique to produce a sound or accurate pitch.
- There is no physical discomfort in playing the instrument as a beginner: no sore calluses, awkward chin positions, or painful lip blisters.
- Concepts of dynamics can be learned right away as learners can immediately see, hear, and feel the variance of physical force (or pressure) on the sound subtleties.
- This notion of simple accessibility allows even our youngest learners to play with ease, flow, and refined tone.
- Easy accessibility and a wide range of keys make the keyboard an ideal instrument for improvisation.
- Multiple learners can engage in co-discovery and co-problem-solving at the keyboard.

Theoretical Understanding through Visual-Spatial Reasoning

- Everything about the keyboard is visually laid out in a logical and methodical way. For instance, each note has its own key; from left to right, the sound goes from low to high; the black keys are grouped in patterns of twos and threes throughout the keyboard; and the clear arrangement of black and white keys consisting of half and whole steps is repeated from one octave to the next. These features help novice learners approach note reading and finger positions with deliberate precision and comprehend abstract concepts such as accidentals.
- When the grand staff is rotated 90°, the notes line up with their corresponding keyboard key. This geometric layout and linear visualization enable learners to see the relationships between pitches. As a result, Juilliard's Director of Keyboard studies Aaron Wunsch gives a good reminder that "keyboards provide an immediate and satisfying way for students of all ages to develop a deeper musical understanding of all aspects of a musical score: harmony, melody, counterpoint, and rhythm. Keyboard skills open the door to rapid musical progress."
- A 2015 study led by Dr. Johanna M. Roels and Dr. Peter Van Petegem suggests that a visual-spatial approach at the keyboard may be influential in encouraging children to

start composing.[xi]

Cultivating Aural Skills

- According to a 2010 study conducted by Dr. David Servias, “a keyboard curriculum, if thoughtfully designed, deserves a place among the core requirements for all music students alongside music theory and aural skills training...Playing, listening, improvising and composing at the keyboard will serve as essential components to written theory and ear-training courses.”[xii] Servias also states, “most theory teachers will agree that notating various harmonic progressions and voice leading configurations on staff paper without actually hearing them played results in an incomplete and superficial understanding of harmony.”[xiii]
- The keyboard’s exceptional structure to provide instant aural feedback enables the learner not only to differentiate sounds in general but also to internally “hear” the relationships between pitches and chords.

Unparalleled Range

- Unlike other instruments, the keyboard covers 88 notes of the musical scale, comprising the full range of the orchestra! This feature leads to more compositional choices, creativity, and expression while improvising and composing.
- This expansive range also permits students not only to play a melody, but also to accompany it themselves with a bass line or chords at the same time.
- The physical layout of the keyboard and bench enables multiple players on a single instrument for co-improvisation and ensemble playing.

Mastery of Two Lines

Keyboard players develop a unique brain aptitude, having trained to read two different clefs while navigating 88 keys with both hands.

- In her article, "Bimanual Labor: The Neuroscience of Piano Playing," Julia Turan states, “the pianist’s strategies to generate and optimize her performance are constrained by her muscular and nervous systems. Coordinating her right and left hands is just one of the tasks her brain needs to carry out while playing music. Most piano music requires your left and right hands to perform radically different motor tasks.”[xiv]
- Most people are born with the depths of the brain’s central sulcus deeper either on the right or on the left side, which determines a natural preference for a dominant hand. However, in one research study, scientists found that pianists were able to strengthen their weaker side and balance both parts of the brain by mastering the use of both hands.[xv]
- A 2004 study led by Dr. Bernhard Haslinger and his team at the Neurologische Klinik in Munich scanned the brains of 12 professional pianists and 12 nonmusicians while they executed various finger movement tasks with both hands. The findings suggest “increased efficiency of cortical and subcortical systems for bimanual movement control in musicians,” and they conclude, “this may be fundamental to achieve high-level motor skills, allowing the musician to focus on artistic aspects of musical performance.”[xvi]

- After learning to play the keyboard, learning to play other instruments becomes easier due to the acquired note-reading skills and the increased hand-eye coordination and fine motor skills.

Enhanced Language Development

- A study from MIT found that Mandarin-speaking kindergarten students who took piano lessons showed increased ability to distinguish pitch and understand spoken words after only six months of study.[xvii]
- Charles Limb of Johns Hopkins University indicated that when a pianist engages in a musical conversation through improvisation, the language part of their brain that controls the grammatical and structure syntax stays active.[xviii]
- Another study, led by Long Island University, revealed that elementary school children who received three consecutive years of in-class keyboard training outperformed students who did not receive piano training in vocabulary and verbal sequencing tests. [xix]

Additional Opportunities and Benefits

- Having basic knowledge of theory and keyboard skills makes it easier to write, publish, and record using various digital software.
- Students can easily perform and share their own creative performance arrangements and original compositions with others.
- Keyboard skills can take learners in many different directions in terms of musical genre and style. It can lead to other experiences in a variety of settings, including classical chamber music, jazz ensemble, rock band, church choir accompaniment, etc.
- In her research abstract for a 2013 study, Dr. Pamela D. Pike indicated that the employment of specific cognitive and collaborative strategies in group piano classes for music education majors led to increased test scores as well as “improvement in self-efficacy, problem solving, and deliberate practice and demonstrated persistence in completing piano assignments.”[xx]

As illustrated by extensive research and a long-standing legacy of praxis, the keyboard should be an essential part of a music curriculum. By acting as an entry point for music theory, ear training, improvisation, and composition, prolonged keyboard study will open the pathway to a repertoire of great masterpieces, thus helping each student grow and thrive as an engaged listener, composer, interpreter, and communicator of the arts.

[i] "The Symphony of Science," the website for the Nobel Prize, March 2019, <https://www.nobelprize.org/symphony-of-science/>.

[ii] Anthony Tommasini, "Condoleezza Rice on Piano," *New York Times*, April 9, 2006, <https://www.nytimes.com/2006/04/09/arts/music/condoleezza-rice-on-piano.html>.

[iii] Tony Margiotta, "Close Encounters: Steven Spielberg's Synergy of Science and Music," *The Musiconomy*, <http://www.themusiconomy.com/close-encounters-steven-spielbergs-synergy-of-science--music.html>.

[iv] Yun Nan et al., "Piano Training Enhances the Neural Processing of Pitch and Improves Speech Perception in Mandarin-Speaking Children," *Proceedings of the National Academy of Sciences of the United States of America* 115, no. 28 (July 10, 2018): E6630–E6639, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6048476/>; Ingo Roden, Gunter Kreutz, and Stephan

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[vi] Servias, "Towards Confident and Informed Musicianship."

[vii] Johanna Maria Roels and Peter Van Petegem, "Children Composing and Their Visual-Spatial Approach to the Keyboard," *Music Education Research* 17, no. 4 (2015): 381–396, <https://www.tandfonline.com/doi/abs/10.1080/14613808.2014.930118>.

[viii] Ana Luísa Pinho et al., "Connecting to Create: Expertise in Musical Improvisation Is Associated with Increased Functional Connectivity between Premotor and Prefrontal Areas," *Journal of Neuroscience* 34, no. 18 (April 30, 2014): 6156–6163, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4004805/>.

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[x] Pamela D. Pike, "An Exploration of the Effect of Cognitive and Collaborative Strategies on Keyboard Skills of Music Education Students," *Journal of Music Teacher Education* 23, no. 2 (March 2013): 79–91, <https://journals.sagepub.com/doi/10.1177/1057083713487214>.

[xi] Roels and Petegem, "Children Composing."

[xii] Servias, "Towards Confident and Informed Musicianship," 1.

[xiii] Servias, "Towards Confident and Informed Musicianship," 3.

[xiv] Julia Turan, "Bimanual Labor: The Neuroscience of Piano Playing," *NeuWrite West* (blog), March 9, 2016, <http://www.neuwritewest.org/blog/j530f20hhqudhu3kxx5jg256dq5di>.

[xv] Watson, "What Can Studying."

[xvi] Haslinger et al., "Reduced Recruitment," 206.

[xvii] Nan et al., "Piano Training."

[xviii] Luran Neergaard, "Brain on Jazz: Novel Study Puts Pianists in MRI Scanners to Show Link between Music, Language," *Huffpost*, February 19, 2014, https://www.huffingtonpost.ca/2014/02/20/brain-jazz-music-language_n_4818631.html.

[xix] Joseph M. Piro and Camilo Ortiz, "The Effect of Piano Lessons on the Vocabulary and Verbal Sequencing Skills of Primary Grade Students," *Psychology of Music* 37, no. 3 (July 2009): 325–347, https://www.researchgate.net/publication/247733637_The_Effect_of_Piano_Lessons_on_the_Vocabulary_and_Verbal_Sequencing_Skills.

[xx] Pike, "An Exploration of the Effect."