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Piano Education in China:

A Retrospective on the Past, Assessment of the Present, and Visions for the Future

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Abstract

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The popularization of piano education in China has only become prevalent in the past 30 years. Today, China has become one of the countries with the world's largest number of piano students. This fact illustrates that, in China, piano learning is no longer the privilege of the elite but is gradually becoming increasingly common for the middle class. Piano performance is regarded as an elegant art that can enhance one's aesthetic sensibilities—and meet the expectations of Chinese parents, who value their children's musical education. This perception has led an increasing number of families to incorporate piano lessons into their children's extracurricular programs. Moreover, the emergence of smart piano technology brings new possibilities for piano education, providing students with a more personalized, flexible, and productive learning experience.

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Chapter 1. INTRODUCTION

Piano education has a fascinating and complex history in China, shaped by a variety of social, cultural, and political factors. Foreign missionaries and traders introduced Western music in the early 20th century, influencing the early development of piano education in China. Over the years, piano education has undergone many changes and transformations, from the rise of piano playing in the upper class during the 1920s – 1930s, to the suppression of Western music and pianos during the Cultural Revolution in the 1960s – 1970s, to the resurgence of piano playing and Western classical music during the 1980s – 1990s.

Today, piano education in China faces many challenges and provides many opportunities. With a large population and a growing middle class, China has significant potential for the growth and development of its piano education. However, there are also obstacles to overcome, such as the need for qualified teachers, insufficient facilities and funding, and competition from other forms of entertainment and education. Therefore, it is essential to examine the past, present, and future of piano education in China to understand its current state better and identify opportunities for improvement. This paper aims to provide an overview of the history of piano education in China, analyze the current state of piano education, and explore the potential for future growth and development. By doing so, I hope to contribute to a greater understanding of the role of piano education in China's cultural and educational landscape, and to provide insights into how piano education can be improved in the years to come.

One of the biggest reasons why I am intrigued by this topic is that I have always wondered about the differences that could have affected piano learning 25 years ago, compared with piano learning today. Learning to play the piano has changed significantly over the years with the

advancements in technology and new teaching methodologies. While traditional education methods are still valuable, incorporating new tools and approaches can make learning the piano more enjoyable, engaging, and effective. In the past 20 years, some Chinese families have adopted strict and forced educational methods, commonly referred to as “tiger parenting.” This approach emphasizes discipline, competition, and achievement, which can sometimes lead to excessive pressure on children. Parents nowadays tend to be more tolerant of their children's progress, focusing on their interests and cultivating a sense of achievement from within, rather than using the punitive teaching methods of the past. Therefore, not only has the education system made progress, but the social environment and family relationships have also seen many changes.

At the same time, it is important to recognize that traditional learning methods, such as in-person instruction with a qualified teacher, are still valuable and effective, and such methods are still the first choice now. The key is to find the learning method that works best for each student and to cultivate his or her passion for learning. My approach in this paper is to examine how past and present patterns and trends can provide valuable insights into the evolution of education and learning over time and help anticipate future developments and potential challenges.

Provide an overview of the history of piano education in China

Charlie Albright, a classical pianist who received an Avery Fisher Career Grant and won a Gilmore Young Artist Award, stated that:

“The National Endowment for the Arts reported that in 2012, only 8.8% of Americans had attended a classical music performance in the previous 12 months, compared to 11.6% a

decade earlier. ‘Older Americans are the only demographic group to show an increase in attendance over a decade ago,’ the NEA study found.”¹

In other words, today's young Americans are not interested in classical music. It is indeed not difficult to see that fewer young people are sitting in concert halls these days, and the result is that classical music is declining in the United States. At the same, can we say classical music is dying out in the United States? The answer to this question might not be affirmative.

While it is true that the attendance of classical music performances among young Americans has declined in recent years, it is essential to note that classical music is still performed and appreciated by many people in the United States. Attendance may have declined, but this does not necessarily mean that classical music is dying out. In fact, there are still many professional symphony orchestras, opera companies, and chamber music ensembles that continue to perform regularly in the United States. In addition, there are many music schools and conservatories that offer classical music education. In addition, classical music has a rich history and a large body of works that continue to be studied and performed by musicians and enthusiasts around the world. While popular music may dominate the airwaves and streaming platforms, classical music continues to occupy an important place in the cultural milieu of the United States. Nonetheless, it is important to recognize the challenges classical music faces in the current cultural climate, including competition from other forms of entertainment and changing societal attitudes toward the value of classical music.

Elissa Milne, an Australian composer and piano teacher states that:

“The raw number of students taking piano as their major for the undergraduate degrees in the United States has increased significantly over the past twenty years (roughly a 25% increase),

¹ Charlie Albright, “Classical’ Music Is Dying...And That’s Good,” CNN, 2016, <https://www.cnn.com/2016/05/29/opinions/classical-music-dying-and-being-reborn-opinion-albright/index.html>.

numbers for masters have increased slightly (currently around the 1000 mark) and numbers of students enrolled in doctoral programs with a piano major have increased astronomically (currently around 1000, up from only about 400 less than ten years ago).”

Citing information she learned from MTNA conference presentations by publishers, piano manufacturers, and teachers. However, “these raw figures don’t tell the complete story,” She asserts. “More and more piano majors (all levels) are international students (so these figures don’t reflect piano learning activity in the U.S. in any case).”² She points out that the growing number of international students coming to the U.S. to study piano majors is significantly increasing.

Before 2000, it was rare to hear about Chinese piano students graduating from American universities, but now, many Chinese students majoring in piano attend top American music schools. On the other side of the globe, the phenomenon of studying Western music is skyrocketing in China, and it seems that everybody has suddenly grown an interest in playing piano. According to the China Art Association, about 50 million Chinese children were learning a musical instrument by 2018, and the piano was among the most popular options. “Thirty million to forty million children in China take piano lessons, compared to less than 10 million in the rest of the world,” said Benjamin Steiner, CFO of Steinway & Sons. “So, 60 – 80 percent of kids playing the piano are in China.”³ Meanwhile, there are more and more wonderful Chinese pianists, such as Lang Lang, Yujia Wang, and Haochen Zhang, who are performing as soloists with American symphony orchestras.⁴ In the last twenty years, piano as a classical music endeavor has been flourishing in the world.

² Elissa Milne, “Is the Study of Piano Declining in the United States of America?,” March 30, 2012, <https://elissamilne.com/2012/03/30/is-the-study-of-piano-declining-in-the-united-states-of-america/>.

³ Xiaojin Ren, “Steinway & Sons Upbeat on Hitting the Right Notes,” ChinaDailyHongKong, March 19, 2019, <https://www.chinadailyhk.com/articles/136/25/227/1552967864959.html>.

⁴ Haocheng, Zhang was a Gold Medalist winner of Van Cliburn International Piano Competition in 2009, and the first Chinese pianist won the first prize in this competition.

One of the top piano brands, Steinway & Sons, has revealed that revenue growth in China has escalated more than 15% annually over the last decade, and eclipsing the number of sales in the United States and Europe. China has been the largest market for Steinway—aside from the United States—comprising a third of its earnings from global sales.⁵ This demonstrates how seriously people consider piano education in China. It doesn't take an economist to conclude that China's classical market is too important to ignore. Deutsche Grammophon (DG) launched its 120th birthday celebration in 2018 in Beijing—not Berlin—and with its latest signing, the Shanghai Symphony Orchestra (SSO). There's no doubt that DG intends to enlarge its revenue by signing a long-term deal with SSO because of the size of the Chinese classical market. Dr. Clemens Trautmann,⁶ DG's president says “Interest from the younger generation and wide access to mobile technology means there is an opportunity for growth. And growth means growth. It's widely believed that China' market will be top 10, will soon become top five—perhaps top three.”⁷

Recently, many American graduate and undergraduate music programs depend on Asian and American Asian students to fulfill enrollments. Some schools dispatch faculty and administrators on recruitment trips to audition students in Asia and offer financial aid and scholarships. This approach is particularly attractive: Chinese music conservatories do not typically offer scholarships in their acceptance letters, perhaps because the cost of tuition is relatively low at around \$1,500–1,600 per year.⁸ It is worth noting that the trend of Asian students in classical music

⁵ Javier C. Hernández, “Steinway’s Grand Ambitions for Its Pianos in China,” *The New York Times*, July 9, 2016, sec. Business, <https://www.nytimes.com/2016/07/10/business/international/steinways-grand-ambitions-in-china.html>.

⁶ Clemens Trautmann is a lawyer with a music background of classical training in clarinet. He Studied Lübeck Academy of Music and Juilliard School

⁷ Andrew Mellor, “Looking Eastwards,” *The Gramophone* 96, no. 1173 (2019): 16.

⁸ According to the Ministry of Education, the tuition fee for music performance majors is 10,000 CNY, around \$1,540 dollar; and the rate is 38,000CNY, around \$5,300 for international student.

is not limited to the United States. Michael Paarlberg elaborates: “Asians make up just over 4 percent of the U.S. population, but 7 percent of U.S. orchestra musicians are Asian, and the figure rises to 20 percent for top orchestras such as the New York Philharmonic. At the elite Julliard School for Music, one in five undergraduates—and one in three Ph.D. students—is Asian.”⁹ Without a doubt, the percentage of Asians studying classical music is on the rise in America.

The popularity of piano education, also known as “Piano Mania,” is rapidly growing among Chinese youth. Many families consider learning piano a fashionable trend, but what motivates them to encourage their children to learn this instrument? The piano was notably not invented in Asia and is not typically sold at a friendly price for most families. Furthermore, there are many traditional Chinese instruments that remain popular today.

In subsequent chapters, I will explore the various factors that contribute to the growing popularity of piano education in China. Firstly, learning the piano is seen as an effective way to improve personal characteristics and fulfills parents' pursuit of their children's future competitiveness in higher education. Especially as the middle class grows and the economy develops, parents can afford to invest a lot of time and money to support their children's learning. Additionally, government policy also supports cultural education and encourages the cultivation of young people's artistic improvement, which makes music education, especially piano education, highly valued. In the last chapter, I will also explore the possibility of future models in piano education.

The different rate is similar as the policy of in-state tuition for some American universities. (Central Conservatory of Music, “Admission Regulations for Undergraduate Study 中央音乐学院 2024 年本科招生简章—中央音乐学院,” www.ccom.edu.cn, January 12, 2024, <https://www.ccom.edu.cn/info/2831/231291.htm>.)

⁹ Michael Ahn Paarlberg, “Can Asians Save Classical Music?” *International Examiner* (Seattle, Wash. 1973) 39, no. 4 (2012).

Chapter 2.

The origin of the piano in China.

Since the 17th century, most emperors during the Ming and Qing dynasties rejected Western culture, with the exception of Emperors Kangxi and Qianlong, who implemented a closed-door policy that allowed China to stop relying on foreign influence but still accept foreign ideas and assimilate them according to China's needs.¹⁰ In 1601, Italian Jesuit missionary Matteo Ricci (1552–1610) presented a clavichord, meant to be a part of gift to Emperor Wanli. However, Wanli was intrigued not by music but by weaponry.¹¹ The first person in China to take an interest in and learn how to play a Western keyboard was Emperor Kangxi in 1673. He studied under a Portuguese Jesuit missionary named Thomas Pereira (1645–1708) and was able to perform some simple sonatas. Pereira's primary duty was to teach Kangxi's three sons, thereby introducing Western music theory to the Imperial Court. Pereira's compositions, in the vein of Corelli, were roughly in the European Baroque style of the day.¹² For the following two hundred years, keyboard instruments were continuously brought to the Eastern Continent and were preserved in the palace as treasures that became the emperor's personal possessions. People other than the emperor rarely had the opportunity to hear these instruments performed; hence, their influence did not spread to different levels of society. It is perhaps unfortunate that keyboard instruments consequently neither spread throughout China nor integrated with traditional Chinese music in any way.

¹⁰ Joyce Lindorff, "Missionaries, Keyboards and Musical Exchange in the Ming and Qing Courts," *Early Music* 32, no. 3 (2004): 407, <https://doi.org/10.1093/em/32.3.403>.

¹¹ *Ibid.*, 72.

¹² David Francis Urrows, "The Pipe Organ of the Baroque Era in China," in *China and the West* (University of Michigan Press, 2017), 21–48.

The development of piano education before 1949

In the early 20th century, the modern piano was finally introduced into China and was predominantly used in church schools. Because of the Boxer Protocol in 1901,¹³ the Qing government was forced to grant permission for foreign military troops to be stationed in Beijing, so the sanctions on missionaries were lifted.¹⁴ In 1927, the National Conservatory of Music was founded in Shanghai by Xiao Youmei, becoming the first professional music institute in the history of China to offer Western instrumental instruction in piano, violin, and cello. Youmei, with a doctorate in musicology and a profound observation of Western music schools, was the right person to establish this Conservatory. Xiao was promoted to the school's dean by Cai Yuanpei, the Minister of Education in China. Xiao was primarily responsible for the entire school's administration and daily operations.¹⁵ Later, in 1956, it was officially renamed the Shanghai Conservatory of Music and remains one of the top conservatories in China today. Xiao invited Soviet pianist Boris Zakharov (1888–19430) to teach at the conservatory, where he had made a tremendous contribution to early Chinese piano pedagogy. At the time of his appointment to the Conservatory as a faculty member and director of the piano program, Zakharov already possessed an illustrious pedigree. He had graduated from the Saint Petersburg Conservatory, where he was a student of Anna Yesipova (1851–1914),¹⁶ who was also the teacher of Heinrich Neuhaus and Sergei Prokofiev; Zakharov had in fact been friends with Prokofiev since childhood. Moreover,

¹³ The Boxer Protocol was signed between Qing government and Eight nation alliance, including Austria-Hungary, France, Germany, United Kingdom, Italy, Japan, Russia, and the United States. It was considered as one of the Unequal Treaties.

¹⁴ Foreign Policy Association. *Foreign Troops and Warships in China*. Editorial Information Service. Series 1925-26 [vol. I], No. 7. January 9, 1926, 6-7.

¹⁵ Tobias Janz and Chien-Chang Yang, *Decentering Musical Modernity: Perspectives on East Asian and European Music History* (Bielefeld: Transcript-Verlag, 2019), 131–34.

¹⁶ Anna Yesipova was one of the brilliant pupils of Teodor Leschetizky, and married Leschetizky in 1880.

Zakharov had studied composition with Nikolai Rimsky–Korsakov and later studied with Leopold Godowsky in Vienna.¹⁷ There were a fair number of pianists under Zaharoff’s guidance who later became the first-generation Chinese pianists.¹⁸ Mario Paci (1878–1946)—an Italian musician who studied with one of Franz Liszt’s last students, Giovanni Sgambati—founded and conducted the Shanghai Symphony Orchestra in 1918. One of the most famous piano educators in early 20th century China, Paci’s students included Fou Ts’ong and Zhou Gangrene. The Shanghai Symphony Orchestra later became the foundation for today’s Shanghai Conservatory.¹⁹ Between 1937 and 1949, under the dual setbacks of World War II and the Chinese Civil War, Chinese piano education developed so slowly that it was basically at a standstill. With limited resources, the National Conservatory of Music—already in the fallen area of Shanghai—found its operations substantially diminished.

The development from 1949 to 1979

The People’s Republic of China was founded in 1949, and the government rebuilt the education system and music pedagogy alongside it. The predecessor of the Shanghai Conservatory of Music (SCOM), the National Conservatory of Music, had trained many musicians who served in this mission to rebuild music education. Simultaneously, The Nanjing National Conservatory of Music was merged with other schools in Beijing and was renamed the Central Conservatory of

¹⁷ Hon-Lun Helan Yang, Simo Mikkonen, and John Winzenburg, *Networking the Russian Diaspora: Russian Musicians and Musical Activities in Interwar Shanghai* (University of Hawaii Press, 2020), 131–32.

¹⁸ Sheila Melvin and Jindong Cai, *Rhapsody in Red* (Algora Publishing, 2004), 100–110.

¹⁹ Claire Roberts, *Friendship in Art: Fou Lei and Huang Binhong* (Hong Kong University Press, HKU, 2010), 138.

Music (CCOM).²⁰ With the best support and funding, the piano departments of these two conservatories grew rapidly. Six other conservatories were later established in Shenyang, Sichuan, Wuhan, Xi'an, Xinghai (located in Guangzhou), and Tianjin, all of which instituted piano programs.²¹ With the addition of the two conservatories in Beijing and Shanghai, there were eight professional music schools in China. Starting in 1966, China endured the decade-long Cultural Revolution. During this period, the development of piano education in China was very slow and even stagnant due to the influence of leftist oppression. Pianists were no longer allowed to perform, nor were they recognized as teachers who could teach music. Thus, teaching in music schools became chaotic and students could not study Western music.²²

Between 1966 and 1976, the development of music was suppressed, especially Western music. The piano is a representative of Western classical music, so all activities introducing piano teaching and performance were forbidden, and many accomplished pianists and faculty members were sent to the countryside for re-educating. To continue piano performance, some of these pianists came up with the idea of performing traditional Chinese folk tunes on the piano. Because of this, the Chinese piano repertoire blossomed at that time. A piano concerto, *Yellow River*, was commissioned by a group of Chinese composers including Yin Chengzong and Chu Wanghua. This piano concerto was inspired by the melody from a cantata composed initially by Xian Xinghai; *Yellow River* is symbolic of the spirit of defending the motherland in the Sino-Japanese war. Since then, it has become the most famous work in the Chinese piano repertoire. The momentum of the

²⁰ Chingchih Liu and Caroline Mason, *A Critical History of New Music in China*, 1st ed. (Hong Kong: The Chinese University Press, 2010), 93.

²¹ *Ibid.*, 93.

²² Richard Curt Kraus, *Pianos and Politics in China: Middle-Class Ambitions and the Struggle over Western Music* (New York: Oxford University Press, 1989), 55.

music is inspiring; it has also become the first work to successfully combine features of Western instrumental and Chinese folk music.²³

The Important figure after the reform: Zhou Guangren

The Cultural Revolution ended in 1976. Two years later, with encouragement from Deng Xiaoping, the new prime minister, China finally started to open, and an increasing number of Western pianists came to visit. Chinese piano teachers also began to rethink and change their techniques and teaching methods. The most famous Chinese piano pedagogue was Zhou Guangren, who decided to stay and help to develop the piano department at the Central Conservatory of Music (CCM), where she served as director. This was not easy, as the piano and all Western music had suffered a setback under the repression and persecution of the Cultural Revolution. Zhou Guangren was a highly renowned teacher at the CCM and one of China's most influential educators; many great pianists have benefited from her guidance and tutelage. With the distinguished contribution she made to the Chinese piano pedagogy, she is greeted as Madame Zhou (周先生).²⁴

Zhou Guangren was born into a Chinese family in Hannover, Germany, in 1928 and returned to China in 1933 with her family so that she could study at a German school in Shanghai (she passed away in 2022). At the age of eight, she began to learn piano from several talented piano teachers, including Qian Qi, Shande Ding, Mario Paci, Alfred Marcus and Bela Belai. Zhou began her solo career in the 1940s. By 1949 she was appointed to the Shanghai Conservatory of Music, and soon she won prizes in East Germany in 1951, followed by the Schumann International Competition in 1956. Few Chinese musicians were allowed to travel to Eastern Europe at that time,

²³ Ibid., 128

²⁴ The custom of calling a female scholar or woman of high moral standing and social influence “Madam” began in the 1910s.

and she was one of the first Chinese musicians to win an international prize. However, during the Cultural Revolution, she was forced to leave Beijing and was forbidden from playing the piano for ten years (1966–1976).²⁵

During her undergraduate studies, Chi Lin, a student of Zhou, wrote about how Zhou conducted piano lessons. According to Lin, Zhou required her to play technical exercises at every lesson, which included finger exercises that Zhou had written, as well as scales, arpeggios, and Hanon exercises.²⁶ Zhou strongly believed that having a strong finger technique was a priority in the earlier years of piano study, likely due to her own earlier studies with Boris Zakharov and Mario Paci. The tradition of studying with virtuosic teachers is evident in this lineage: Paci had been a student of Giovanni Sgambati, who in turn was a student of Franz Liszt.²⁷ Zakharov was a student of Leschetizky's student and wife, Anna Yesipova. Both Zakharov and Paci seemed to have strong backgrounds emphasizing finger techniques:

Yesipova advised her students to work on scales, chords and arpeggios, thirds and octaves as well as ornaments. She taught them to work on precise legato and staccato articulation, to cultivate a cantilena touch, to pay careful attention to dynamics and pedaling.²⁸

The Russian school of piano pedagogy highly emphasizes the importance of technique, and finger exercises are very important. Another reason for Zhou's high emphasis on finger technique may have been that almost all Chinese pianists had no access to a piano during the Cultural Revolution, thereby losing their sense of touch and flexibility. Zhou became the first director of

²⁵ Janet Horvath, "The Great Women Artists Who Shaped Music XVI: Zhou Guangren," *Interlude* (blog), January 10, 2016.

²⁶ Chi Lin, "Piano Teaching Philosophies and Influences on Pianism at the Central Conservatory of Music in Beijing, China" (ProQuest Dissertations Publishing, 2002).

²⁷ Stanford Libraries, "Early Life (1878-1902), Mario Paci: An Italian Maestro in China," Stanford University, n.d., <https://exhibits.stanford.edu/paci>.

²⁸ Christina Guillaumier, "From Piano to Stage: A Genealogy of Musical Ideas in the Piano Works of Sergei Prokofiev (1900 - C.1920)" (PhD dissertation, University of St Andrews, 2010).

the piano department in the Central Conservatory in 1978. She realized that her students at that time needed to work on the fundamentals of technique, and the emphasis on finger exercises thus became part of her teaching philosophy:

Regarding hand position, Zhou instructs her students to hold the knuckles high and curve the fingers before playing. The hand should be shaped just like a dome with every finger curved. She explains that a hand without strong knuckles and firm finger support is like a house without a roof and foundation. Zhou taps her students' fingers and knuckle joints to test their firmness. However, she suggests using flat fingers in playing melodies in Chopin's music. Zhou does not allow a high wrist because it increases tension in the hand. The wrist should be slightly lower than the knuckles and it should be flexible at all times. In Zhou's opinion, the ideal hand position includes high knuckles, firm fingertips, and a loose wrist.²⁹

In 1982, Zhou suffered a disaster when she volunteered to help move a piano. Suddenly, one of the piano's legs broke, causing it to fall on her three fingers. Although the operation successfully prevented the need for amputation, Zhou's fourth finger permanently lost one joint, leaving it shorter than the others. During the long recovery process, Zhou began to conceive the idea of providing music education for all children and, between 1983 and 1993, founded two piano schools for children. These nurtured many talented young pianists and exerted a wide social influence. She also organized many piano competitions and was responsible for many piano examinations.³⁰

The development since 1990s to the present

The piano has only become popular in China since the late 1980s, and two pianists in particular have had a great influence on the proliferation of 'piano mania'. The first, French pianist Richard Clayderman, mostly performed and recorded movie soundtracks and popular easy classical music, elevating one piece, "Ballade pour Adeline", to such fame that it arguably became

²⁹ Chi Lin, "Piano Teaching Philosophies and Influences on Pianism at the Central Conservatory of Music in Beijing, China" (ProQuest Dissertations Publishing, 2002).

³⁰ Horvath, "The Great Women Artists Who Shaped Music XVI: Zhou Guangren. "

the most popular piano piece of the 1990s. The piano had previously been known as a Western instrument on which only authentic, serious classical music is performed, but Classical music was still a niche market and not universally well known.

By contrast, Clayderman performed only catchy, popular songs that went on to become popular. In the 1990s, almost every family owned at least one cassette tape of Clayderman's performances. In 1992, he held his first concert in Beijing and it went viral; his album skyrocketed overnight to become a best-seller. His music could be heard everywhere, from transportation hubs to restaurants and university campuses. Because of his arrangement of "easy classical" music, studying the piano became an invigorating form of enjoyment at that time.³¹

The second pianist, Lang Lang, was considered a piano prodigy in the late 1990s. His father gave up his job and moved to Beijing so that Lang Lang could study with a teacher at the Central Conservatory of Music. Lang Lang has had a huge impact on the world of classical music, something *The Today show* even called the "Lang Lang effect." Because of his dedication and discipline in learning the piano, and because of the character of perseverance that pervades his career, Lang inspires many children and families to learn the piano.³² Without a doubt, these two pianists have increased the popularity of the piano in China and excited the population's interest in studying it.

Learning piano becomes a fashion

³¹ Jeremy A Murray, Perry Link, and Paul Pickowicz, *China Tripping: Encountering the Everyday in the People's Republic* (Lanham: Rowman & Littlefield, 2019), 99.

³² Xiaojian Zhao and Edward, *Asian Americans: An Encyclopedia of Social, Cultural, Economic, and Political History* (Santa Barbara, California: Greenwood, an imprint of ABCCLIO, LLC, 2014), 744.

Since 1980s, China has implemented the One-Child Policy, which was a great burden for that generation. Many families faced social pressure as a result of the policy, which imposed limits on family size and often led to forced abortions and sterilizations. However, as birth rates declined, families could invest more in economic activities, contributing to economic growth. At the same time, the next generation born into smaller families was expected to benefit from improved education, health care and economic opportunities. A family with limited resources became able to spend more money on its only child, and that child could therefore have a better education. Moreover, many families started to enjoy increased income in the late 1990s, and this bolstered the middle class. Recently, pianist Tianshu Wang explained, “Nowadays with the rapid financial development in China, families want to provide the best possible education for their children. Studying a musical instrument has become fashionable and essential. Many families choose the piano, and they can afford the instrument and the lessons. As with Lang Lang's family, 'piano parents' can be extremely devoted.”³³ These “piano parents” are a predominantly urban, middle-class group of parents who are willing to invest significant financial resources to allow their children to take piano.

Another well-known reason for learning piano is the “Mozart effect,”³⁴ which asserts that young children who listen to Mozart’s music are more intelligent than those who don’t. The study shows that early language development and spatial–temporal intelligence can be improved by piano lessons for young children. As a result, piano- training institutes often attract parents by

³³ Hao Huang and Tatiana Thibodeaux, “Teaching Piano in China: Building Transcultural and Transhistorical Bridges through Music Education,” *International Research in Higher Education* 1, no. 2 (March 24, 2016), <https://doi.org/10.5430/irhe.v1n2p25>.

³⁴ Frances H Rauscher, Gordon L Shaw, and Katherine N Ky, “Listening to Mozart Enhances Spatial-temporal Reasoning: Towards a Neurophysiological Basis,” *Neuroscience Letters* 185, no. 1 (1995): 44–47, [https://doi.org/10.1016/03043940\(94\)112214](https://doi.org/10.1016/03043940(94)112214).

claiming that piano lessons will make their children smarter. There is a saying in China that if you want to raise a child with an intelligent mind, the child has to have flexible fingers. The piano requires the activity of all ten fingers, so children can develop their brains by learning the piano. A recent study has shown that children who undergo music training appear to experience better brain development and exhibit superior cognitive abilities compared to those who do not receive any music training. Even a six-week experiment demonstrated a 20% improvement in memory.³⁵ Therefore, many parents encourage their children to decide to study piano, and I believe that this idea also applies to many other nations.

³⁵ Xia Guo et al., “Improved Digit Span in Children after a 6-Week Intervention of Playing a Musical Instrument: An Exploratory Randomized Controlled Trial,” *Frontiers in Psychology* 8 (January 8, 2018), <https://doi.org/10.3389/fpsyg.2017.02303>.

Chapter 3.

Auditions for Conservatories

There are two types of music colleges in China: music conservatories and ‘normal’ universities. Conservatories, such as the Central Conservatory and the Shanghai Conservatory, concentrate more on Western instruments (although traditional Chinese instruments are also studied) and the emphasis is on performing. ‘Normal’ universities take their name from the French term *école normale* and offer a broad range of majors, both music and non-music.³⁶ Such institutions have been established to basically train teachers. In this research paper, I will focus only on the piano programs offered by music conservatories.

There are some differences in auditions and school curricula between Chinese and American music colleges. For example, the Central Conservatory is considered the top music school in China, and undergraduate piano majors must pass three rounds of auditions. The 2023 audition requirements for undergraduate piano majors are outlined below:³⁷

1. The preliminary audition requires the performance of a Chopin etude, excluding Op. 10, No. 3 and 6 and Op. 25, No. 1, 2 and 7, and also requires a complete classical sonata with all its movements.
2. The second audition requires a technical etude from a composer other than Chopin, one prelude and fugue from J. S. Bach's *Well-Tempered Clavier*, a medium-sized piece (greater than 6 minutes) without any nationality restrictions, and a performance of an assigned piece for sight-reading to be downloaded from the Internet.
3. The third examination includes sight-singing, ear training, and theory exams.

Even after passing all three rounds, applicants are still required to pass a standard national college entrance exam administered by the Department of Culture of the Chinese government.

³⁶ Amy Tikkanen, “Normal School | Teacher Education,” in *Encyclopædia Britannica*, 2019, <https://www.britannica.com/topic/normal-school>.

³⁷ "中央音乐学院 2023 年本科招生简章," (Beijing: Publisher, 2023), <https://zhaoban.ccom.edu.cn/static/中央音乐学院 2023 年本科招生简章.pdf>.

Other music conservatories in China have a very similar approach to piano auditions. However, most American college auditions require the performance of several pieces of contrasting styles and periods. Typically, candidates are required to prepare three repertoire pieces from the Baroque, Classical, or Romantic era, as well as a piece from the 20th or 21st century. Some institutions also require the performance of a technical etude. Prior to this audition, there may be a round of videotaping of all music to determine eligibility for a live audition on campus. Candidates may be asked to complete a sight-reading test and demonstrate proficiency in music theory after enrolling in the program or in the first week of the term.

In addition to the piano exam, academic requirements in China are also crucial. Simply put, applicants must first pass the piano auditions, and only if they exceed the score requirement on the NCEE (National College Entrance Examination, similar to the SAT), can they be admitted. Piano auditions are generally held during February or March, and the NECC takes place in June, allowing the student a few months' preparation. In a somewhat different way, American colleges require applicants to submit two or three letters of recommendation and official transcripts. Some schools may require a pre-screen recording and SAT scores to qualify for a live audition; the live audition with faculty is the main factor for acceptance.

However, Chinese and American institutions share similar graduation requirements for a bachelor's degree in piano. These requirements include music core courses, musicianship, music history, and other electives. Additionally, the degree recitals are essential as a part of the curriculum, providing students with the opportunity to showcase their musical abilities and accomplishments in the preceding years. Moreover, both American and Chinese institutions require completing a bachelor's degree to be admitted to a master's degree program.

Because the number of applicants is highly competitive in China, the audition is designed as a comprehensive exam to ensure that students not only concentrate on studying piano but also have a strong foundation in musicianship and academics. As elaborated in the admissions brochure above, the requirement of virtuosic etudes and Bach contrapuntal works in the first round eliminates many applicants, regardless of how they might perform in the subsequent two rounds. The piano department places high value on finger technique and the ability to analyze and perform Bach's music. My speculation is that as the number of test takers increases, so does the difficulty of the test. This requirement facilitates a more comprehensive enrollment for the applicants, requiring them to learn all different styles, rather than favoring just one or a few composers. Nevertheless, the number of applications each year is still increasing. For example, a record number of 2,486 applicants applied to the Shanghai Conservatory of Music in 2018, almost double the number from the previous year. These students competed for the 396 openings through multiple rounds of auditions over a six-day period, with an average admission ratio of 6.28:1.³⁸

Most Chinese conservatories offer courses in traditional Chinese music, with some making a mandatory curriculum requirement that all students must take this course. For example, the China Conservatory of Music is an institution of higher music education that specializes in cultivating students talented in the education, research, performance, and composition of Chinese traditional music.³⁹ This results in significant collaboration between composers and performers to premiere Chinese music works. However, contemporary music still needs to receive more attention in Chinese music schools. Based on the audition requirements, students still don't necessarily need

³⁸ Fang Jiang, "Shanghai Conservatory of Music's 2018 Enrollment Reaches a New High," gaokao.eol.cn, January 31, 2018, https://gaokao.eol.cn/shang_hai/dongtai/201801/t20180131_1583450.shtml.

³⁹ Robin D Moore, *College Music Curricula for a New Century*, 1st ed. (United Kingdom: Oxford University Press, 2017), 155–65

to prepare 20th- or 21st-century music for their auditions. By comparison, most American music schools explicitly demand a complete work of contemporary music for their auditions.

Number of Application Increasing

Since the reform and opening of the economy in 1978, China has vigorously developed its manufacturing industry. In 2002, the domestic manufacturer Pearl River Piano became the largest piano manufacturer in the world. In 2013, it produced 136,000 pianos, and more than three-quarters of sales were sold domestically, indicating that there were many more piano students.⁴⁰ However, a serious problem began to emerge once it became clear that there were not enough piano teachers to cope with the increasing number of students. The demand was strong and the supply was insufficient. Despite the establishment in 2016 of two new music schools—Zhejiang Conservatory of Music and Harbin Conservatory of Music—the new total of eleven music conservatories still faces an increasing number of applicants every year. Therefore, piano students have begun to study abroad in places such as North America and Europe. As the birthplace of classical music, European countries, especially Germany, France, and Russia, which are home to numerous famous musicians, seem to be the most ideal places to study. However, Chinese students who have learned English since elementary school still make the United States their first choice because they save time in learning other languages. Looking through the faculties of all eleven music conservatories reveals that most newly hired piano instructors from 2010 to 2020 earned doctoral or master's degrees from the United States and Europe.

⁴⁰ Yang Yang, "Piano Makers Ride Musical Surge in China," *ChinaDaily*, November 29, 2014, https://www.chinadaily.com.cn/weekend/2014-11/29/content_18997295.htm.

Guangxian Chen, chairman of the China Symphony Development Foundation (CSDF), reports that there is a growing number of symphony orchestras in China. In 2017, there were around 30 – 40 professional symphony orchestras in China, but this number has now increased to 72. However, many newly founded orchestras still face a lack of professional musicians and need to improve their performance quality. For instance, Suzhou Symphony Orchestra has hired 60% of its musicians from overseas and aims to gradually increase the proportion of local musicians through nurturing local talent reserves.⁴¹ Interestingly, a typical audience of concertgoers in China consists mostly of the younger generation and families with children. This shows the enthusiasm with which these concertgoers enjoy classical music as part of their daily lives. Conversely, most members of the audience of an American classical concert are elderly, and it seems that the younger generation doesn't consider classical concerts to be an evening's ideal entertainment. Presumably, some feel a lack of interactivity in classical music; the booming music of dancing pop idols like Beyoncé and Ariana Grande entices its listeners to dance with flashlights and balloons.⁴² It's also less presumably appealing for these concertgoers to dress formally and sit for hours without eating or drinking. It's not hard to conclude that classical music seems to be far from attracting the younger generation's attention.

Depression in the Classical Music Market

Nevertheless, the pop music industry erodes the classical music market, and there are more profound reasons behind the decline. Stanford Emeritus Professor Robert J. Flanagan says, "Even

⁴¹ Kun Zhang, "Symphony Orchestras Gain Ground in China," *China Daily* (North American Ed.), 2017.

⁴² Anthony Tommasini, "Classical Music Attracts Older Audiences. Good: Critic's Notebook," *New York Times (Online)*, 2020.

if every seat were filled, the vast majority of U.S. symphony orchestras still would face significant performance deficits.”⁴³ A few cases reveal that the financial situation of symphony orchestra operation has been on thin ice: the Philadelphia Orchestra was on the edge of declaring bankruptcy in 2011, and New York City Opera filed for bankruptcy in 2013 but revived its operations in 2016.⁴⁴ Such cases indicate that the classical music market in the United States is still in trouble. These days, there is very little interest among the majority of American children in learning piano, and being a piano teacher is an “outdated” profession. The 20th century, however, was a golden era during which many of the greatest pianists in history performed in America. Among them were musicians like Van Cliburn, who won the First Prize in the International Tchaikovsky Competition in Moscow; moreover, audiences were thrilled to attend concerts by Artur Schnabel, Vladimir Horowitz, Rudolf Serkin and Claudio Arrau. These great artists inspired many young people to learn piano, and it was a time in America when a family would be proud to own a piano. The piano in the living room was not just an adornment but also a way for children to show off their talent. A family without a piano was not “classy,” and children who did not receive piano lessons might have been considered somewhat uneducated.

There is a notable contrast in work ethic and perceptions of success, particularly regarding musical ability, between Chinese students and their parents and most American children and their parents. In Chinese culture, a strong emphasis is placed on hard work, persistence, and dedication as essential for achieving success. This perspective extends to the belief that one's musical success primarily develops through hard work rather than inborn talent. This cultural mindset fosters the

⁴³ Robert J Flanagan, *The Perilous Life of Symphony Orchestras.*, 1st ed. (New Haven: Yale University Press, 2012), 176–77.

⁴⁴ Mark Vanhoenacker, “Requiem, Classical Music in America Is Dead.,” *Slate Magazine* (Slate, January 22, 2014), <https://slate.com/culture/2014/01/classical-music-sales-decline-is-classical-on-deaths-door.html>.

conviction that consistent practice is very significant. Conversely, within some Western cultures, there may be differing perspectives on talent and the origin of success, with a potentially greater emphasis placed on inborn talent as the driving factor behind musical ability. This outlook might result in different approaches to learning the piano, with varying levels of importance placed on the required amount of work and practice for achievement. There are still plenty of hard-working families in America, and this is not the place to discuss misconceptions about hard work. Chinese children identify more with playing the piano and find it more intrinsically enjoyable than American children, even though they are more interested in pleasing their teachers and parents. One study even showed that Chinese children spend an average of 295.26 minutes per week on piano playing, much higher than 159.29 minutes for American children.⁴⁵

However, one should note a peculiar phenomenon that indicates a shift in American culture. Americans assign great importance to sports, and parents encourage their children to sign up for swimming, ice skating, basketball, football, and other sports. Therefore, American parents are likely not as enthusiastic about developing their children's artistic talents as they used to be. In 2019, the salary of Alabama University football coach Nick Saban, at \$9,300,000, was the highest of his peers, and even the lowest salary, that of coach Jamey Chadwell from Coastal Carolina University, was \$319,866. Not even a music professor could earn anything close to \$300,000 from university salary alone.⁴⁶ Others may point out that athletic programs often bring in money, and winning teams can bring in even more money; with all this attention, money naturally goes to the

⁴⁵ Gilles Comeau, Veronika Huta, and YiFei Liu, "Work Ethic, Motivation, and Parental Influences in Chinese and North American Children Learning to Play the Piano," *INT J MUSIC EDUC* 33, no. 2 (2015): 181–94, <https://doi.org/10.1177/0255761413516062>.

⁴⁶ "Football | Coach | Salaries | USA TODAY Sports," USA Today, October 2, 2023, <https://sports.usatoday.com/ncaa/salaries/football/coach>.

sports rather than the less visible arts program.⁴⁷ As a result, sports coaches can command higher salaries than music professors, and parents may be more inclined to support their children's athletic pursuits than artistic ones. While the trend may lean towards sports, there are still many families and individuals who value and support classical music. Additionally, some universities also prioritize the arts and have robust programs in place to encourage students to explore their artistic talents. It's also worth noting that the decline in classical music interest and attendance may not necessarily be solely attributed to the rise of sports culture. There are likely many factors at play, including changes in technology, shifts in cultural values, and evolving preferences of younger generations.

⁴⁷ The above numbers refer only to collegiate athletics, not professional leagues such as the NFL, among whose ranks are many millionaires.

Chapter 4.

Cultural Collision

The BBC documentary “Are Our Kids Tough Enough? Chinese School” vividly presents the cultural conflict between Chinese teachers and British students.⁴⁸ Chinese education strongly emphasizes the length of study and amount of practice, and teachers, therefore, believe that sufficient practice can reinforce muscle memory. The teacher-centered approach posits that the most efficient way to acquire knowledge is for students to attentive and actively take notes whenever the teacher is lecturing. This is followed by practice and memorization until the students are fully prepared for a subsequent test. Classroom discipline is a prerequisite for this approach, especially in large classes of several dozen students. Therefore, discipline is a crucial concern in Chinese classrooms. Those who disrupt classroom discipline are placed in detention by the teacher; alternatively, they may be asked to leave the classroom, and this dismissal would be followed by a meeting with the student’s parents. A Chinese teacher’s authority is unquestionable; teachers believe that students who violate the classroom deserve to be reprimanded. In the documentary mentioned above, the same problem occurs in the classroom of math teacher Zou Hailian, who serves in an elite school in China. He gives fast lectures, quickly going through the material. When he finishes lecturing, he assigns exercises in the class and has the students practice concepts over and over again. However, this method adversely affected his British students. In contrast, before they met this teacher, the students usually worked in small groups, and the group leaders espoused a more focused approach to make the students discover and enjoy math. Although this is an entertainment program designed to attract attention rather than provide serious educational content,

⁴⁸ BBC, “Are Our Kids Tough Enough? Chinese School,” BBC, August 4, 2015, <https://www.bbc.co.uk/programmes/b06565zm>.

the conflict in this documentary illustrates the contrasting classroom performances of two different cultures, making it difficult to define the real winner. Compared to the Chinese education system, which places heavy emphasis on exam scores as the sole basis for admission, there is often a lack of focus on critical thinking and creative problem-solving. In contrast, the British education system tends to have a more relaxed classroom environment with less emphasis on exam scores, making it challenging for students to excel in the same exams.

As a matter of fact, school education in many Asian countries such as Japan, South Korea, and China has been criticized as exam-oriented and teacher-centered, which has caused children to engage in rote learning. Shinichi Suzuki and Edward Howe state that “Even in music education, which is relatively free from exam pressures, cramming knowledge and skills have been practiced (with rote learning).”⁴⁹ There is no denying that this education model is flawed, but it has proven to be viable. Although most Asian countries are constantly reforming their education, the teacher-centered method is still the preferred choice for most public schools. For this reason, most music instructors in China adopt a teacher-centered approach.

The Influence of the Soviet Union

Since the 1950s, the close relationship with the Soviet Union was vital for China as a new country emerging from war and needing to rebuild. WWII and the Chinese Civil War demolished almost all of China’s education facilities and their resources, necessitating the restructuring and re-establishment of education from scratch. Due to the Cold War and the communist alliance with the Soviet Union, China found it convenient to replicate the education system from an ally. For

⁴⁹ Shin’ichi Suzuki and Edward R Howe, *Asian Perspectives on Teacher Education* (Routledge, 2013), 15.

example, the Soviet Union had a ten-year plan for fundamental education for children; China launched a similar twelve-year education plan. At the same time, the Chinese government introduced many textbooks from the Soviet Union, translating them into Chinese and distributing them to schools. Ivan Kairov (1893–1978), a notable pedagogue in the Soviet Union in the 1940s and 1950s, made a massive impact on the Chinese education system.⁵⁰ The idea of his book “Pedagogy” was deeply influenced by Marxism and Stalinism and was soon abandoned after Stalin’s death. Nevertheless, his book influenced every level of Chinese education. The book’s main idea was that a teacher-centered approach should predominate, and indeed that approach continues to this day in China. This approach stands in contrast to the learner-centered approach that predominates in many Western cultures, where the relationship between teachers and students need not be as close.

China studied not only the ideological, economic, and educational aspects of the Soviet Union but also its music education system. A large amount of Soviet literature and teaching materials has been translated into Chinese, and these are widely used in conservatories and universities, even today. A well-known textbook in China named “Harmony” was written by Igor Vladimirovich Sposobin (1900–1954), a musicologist and music theory faculty of Moscow Conservatory. This textbook, one that all music conservatory students possess in their libraries, is based on the functional analysis of harmony as well as Roman numeral analysis. In the Roman numeral analysis system, triads are named after scale degrees, i.e., I, II, III, IV, V, vi, and vii^o; in the Sposobin harmony book, triads are labeled T, Sii, DTiii, S, D, TSvi, and Dvii, and every triad has a specific name. In the Chinese musicianship class, conflating the Roman numerals and functional analysis

⁵⁰ Liyan Huo, Susan B Neuman, and Atsushi Nanakida, *Early Childhood Education in Three Cultures: China, Japan and the United States*. Heidelberg: Springer, 2015, 8.

by Sposobin's theory is preferred, unlike only Roman numerals in the class of the United States. In the 1950s, Alexander N. Serov, Aram G. Tatulyan, and Tatiana P. Kravetchenko, musicians from the famous Russian piano school, came to China and mentored Liu Shikun, Yin Chengzong, Li Mingqiang, as well as piano teachers Zhou Guangren and Zhao Pingguo. The Soviet Union was the only place where students could study abroad, and Liu Shikun, Yin Chengzong, and Zhao Pingguo later went there to study piano. They were the first generation of pianists after the founding of New China and were nurtured under the influence of the Soviet Union. Many of them were dedicated to promoting piano education in China. The most famous younger generation pianist, Lang Lang, studied with Zhao Pingguo when he was in the Affiliated School (pre-college) of the Central Conservatory of Music. Therefore, the affiliation with Russian piano schools has deeply influenced Chinese piano education, impacting teaching materials and pedagogy.

The large volume of music teaching materials brought from Russia significantly improved the situation in China at that moment, which lacked piano teaching methods. There were a few piano compositions written by Chinese composers, but more were needed to form a systematic teaching method. The Russian piano school is quite different from those of other countries, especially Europe and the United States. The Russian school emphasizes tone color and power in playing, considering them necessities for interpreting the Russian repertoire.⁵¹ Moreover, greater emphasis is placed on a straightforward approach to playing, resulting in a more powerful tone and, thus, a distinctive sense of color change that makes the tone exceedingly dramatic. Josef Lhévinne (1874–1944) devoted a chapter of his book *Basic Principles in Pianoforte Playing* to how to achieve a beautiful tone, explaining that the keys should be touched with as much finger's cushion as

⁵¹ Christopher J Barnes, *The Russian Piano School: Russian Pianists and Moscow Conservatoire Professors on the Art of the Piano* (London: Kahn & Averill, 2007), 5.

possible to produce a sound that is “less resistant [and] more springy.” He also underlined the role of the wrist and arm in producing good intonation.⁵² Seen from his point of view, it is clear that a detailed technique-oriented approach is emphasized in the Russian piano school.

Therefore, when the Soviet professors arrived, training in finger technique became a significant priority; it was generally agreed that such a well-grounded foundation would lead to better growth. Ms. Zhou Guangren talked about her interest in exploring how to transfer strength and support from the body to the point on the fingertips. As a female pianist, she envied pianists with large hands; she especially remembered that her teacher, Mario Paci, always “made fun” of her tiny hands. However, she noticed there were some pianists, such as Maria João Pires, Alicia de Larrocha, and Leopold Godowsky, who didn’t possess this advantage. They were only able to reach octaves, yet they could still play splendidly. Her emphasis on the natural weight from the arm to the finger is coordinated with a relaxed body posture. These ideas influenced many next-generation pianists in China. In her book, she elaborated on the significant influence of both Mario Paci and Aram Tatulian:

I was fortunate enough to be selected to study at the Central Conservatory of Music with Aram Tatulian, which opened up new areas for me in terms of piano performance, namely artistic playing and weighted playing methods. The Russian school of piano began in the era of the Romantic style, combined with Russian folk music, which had a strong national character. It is characterized by long melodic lines, [with] emphasis on singing and passion. It is natural to absorb the method of playing using body weight to produce symphonic thickness and tonality. In the 20th century, there emerged a group of performers and educators represented by Heinrich Neuhaus who created a complete school of Russian piano performance and pedagogy and nurtured several generations of excellent pianists. When I first started to learn the piano, I could not play it with the singing tone and weight that it deserved until Tatulian demonstrated a Rachmaninoff Prelude—and my eyes were opened to the fact that the piano could actually sing like that!⁵³

⁵² Josef Lhévinne, *Basic Principles in Pianoforte Playing* (Theodore Presser Company, 1924), 17–24.

⁵³ Dagang Huang, *Zhou Guangren: The Art of Piano Teaching* (Central Conservatory of Music Press, 2007), 9–10.

After one year of studying with Paci, Zhou felt it necessary to lay a solid foundation by learning etudes from Cramer and Clementi every week. She was convinced by Paci of the effectiveness of Cramer and Clementi's etude books in providing balanced finger training for both hands. She thereafter studied the Cramer book exclusively for one year. Instead of learning multiple pieces simultaneously, Paci had her focus on two etudes per week, dedicating daily practice to mastering them in addition to revisiting previously learned ones. After a year of this consistent practice regimen, she could effortlessly play through all 60 pieces within an hour of daily practice.⁵⁴

By contrast, the mainstream teaching philosophy in the United States is to help students develop critical thinking and a passion for learning. To maintain positive self-confidence, teachers constantly give positive feedback in a sincere tone. A typical piano lesson in America consists of such positive reinforcement, whereby students are more likely to form their own opinion rather than being told what to do.

Western Education

Praise, by definition, is an absolute judgment. The use of praise in an educational setting such as a piano lesson may cause the student to seek approval from the teacher rather than to seek to become an independent learner. Rather than using empty phrases such as “Nice playing,” “Good work,” or “I like how solid this is sounding,” the teacher should use specific descriptions of a

⁵⁴ Ibid, 5

student's performance that address aspects of the students' music making that have needed support: "You have improved the pedaling as we discussed in last week's lesson. Thank you."⁵⁵

There is no doubt that two very distinctive education systems exist between the United States and China. After experiencing these two different kinds of education, I realized the difference in how teachers educate their students, which can be summed up in two words: individual and collective. In the United States, teachers are more inclined to develop and stimulate the individual's unique talents and encourage students to find different paths. In China, teachers are more likely to help students find the best answers and the most effective measures to help them grow. While ultimately determining which approach is better is not straightforward, and assessing the impact of different teaching methods on students involves considering multiple perspectives. All the academic performance and motivation between students and teachers are individual experiences, and it's complicated to jump to one conclusion.⁵⁶

Piano education in China has grown tremendously over the past three decades, becoming one of the world's most active and vital piano education markets. In addition to the fact that learning a musical instrument improves children's overall qualities, there is another driving force: students who passed grade 10 or the highest grade in the piano exam were once allowed to earn extra points in the National College Entrance Examination ('SAT' in China). Although this policy was abolished in 2015, this trend of parents signing up their children to learn piano is still widespread, which in turn has fueled a large market for piano lessons and exams; most families don't want

⁵⁵ Derek Kealii Polischuk, *Transformational Piano Teaching: Mentoring Students from All Walks of Life* (New York, NY: Oxford University Press, 2019), 100–101.

⁵⁶ Bennett Reimer, "Music Education in China: An Overview and Some Issues," *The Journal of Aesthetic Education* 23, no. 1 (1989): 65–83, <https://doi.org/10.2307/3332889>.

their children to fall behind other families.⁵⁷ Top universities have a low acceptance rate, making the results of college entrance exams extremely important. On top of that is China's enormous population. Therefore, parents do whatever they can to help their children improve their scores. In China, graduation from a top university helps tremendously in finding a good-paying job.

Due to the competitive peer pressure prevailing in China, parents aspire for their children to gain advantages beyond academics. Therefore, participation in extracurricular programs not only helps children develop personal abilities such as leadership skills, collaboration, teamwork, and problem-solving but also improves their likelihood of later securing better job opportunities and careers. The widespread daily conversation about learning to play the piano and the correlation between piano playing and educational success has contributed to a rapid rise in interest in music education in China. At the same time, numerous piano studios and academies have been established to address market demand.

Lang Lang's story as an inspiration

The importance of inspirational stories for learning must also be addressed. They can inspire motivation and passion, help people overcome difficulties, and persevere in pursuing their goals. Lang Lang's story is widely known in China and has inspired many families and their children. He is one of the most famous Chinese pianists of this generation, and his success is attributable not only to his hard work and talent but also to the cultivation of this talent by his parents. When Lang was eight years old, his father quit his job so that he could take care of him. Lang's mother worked hard to pay for his education, which allowed his father to take him away from his hometown of

⁵⁷ China Desk and Lianhe Zaobao, "China's Middle-Class Families Are Giving up Their Pianos," ThinkChina, January 25, 2024, <https://www.thinkchina.sg/chinas-middle-class-families-are-giving-their-pianos>.

Shenyang to Beijing. Lang also experienced ups and downs and even wanted to give up the piano. There was one moment of misunderstanding when Lang came home late to practice, leading his father to become angry and asking his son to jump off the balcony of their eleventh-floor apartment and take his own life. Of course, his father didn't really mean it. It only showed how disappointed he was that his son didn't focus on practicing after he had given up so much in his own life to devote his time to his son. Lang Lang's relationship with his father was highly intense in his childhood, as his father wanted nothing more than for his son to practice until he achieved success.⁵⁸ And, with the support of his family, Lang Lang eventually overcame the difficulties and became a wonderful pianist. He has become a household name in China and has influenced many Chinese parents to more greatly emphasize their children's music education. Many see Lang Lang as a role model for their children's success, even though their original intent may have been simply to provide music instruction as a hobby for their children. Just as Michael Jordan sparked the basketball boom and Diego Maradona boosted interest in soccer, Lang Lang's success story created a boom in learning piano in China. I can personally say that I am one beneficiary of that story. However, Lang Lang's path to success is one of many. Many pianists do not face pressure from their "tiger" parents; rather, they achieve success through their own hard work and self-motivation.

The Rise of Korean Piano Education: Pressure or Enlightenment

In recent years, South Korea has been genuinely impressive in its efforts to nurture classical musicians, primarily classical pianists. Almost all international piano competitions feature (South) Korean pianists on the list, and the probability of a Korean pianist eventually making the finals

⁵⁸ Lang Lang and David Ritz, *Journey of a Thousand Miles* (Guangxi Normal University Press, 2008), 89–95.

and winning a prize is very high. For example, Yunchan Lim and Yekwon Sunwoo, the gold medalists of the two consecutive Van Cliburn Piano Competitions in 2017 and 2022, are both native Korean pianists, something that is rare to see in major classical music competitions. In addition, Seong-Jin Cho, the gold medalist of the 2015 Chopin International Piano Competition, is also from South Korea. In 2021, Jae Hong Park won first place at the Busoni International Piano Competition, and Su Yeon Kim also won the first prize at the Montreal International Music Competition. Beyond piano competitions, cellist Hayoung Choi won the 2022 Queen Elisabeth Competition, and two weeks later violinist Yang In-mo became the first Korean winner of the Sibelius Violin Competition. Korean musicians can be seen coming out on top in many of the major international classical music competitions in 2022, and one finds the names of many Korean musicians on the finalists' lists from many international music competitions.

Korean piano education has skyrocketed lately, not because a few individual outstanding pianists are making a great career, but because they have a highly competitive education system to support and surround them. There are reasons behind the impressive performance of Korean pianists in the competition that parallel the development of piano education in China that are worth exploring in depth. Primarily because China and Korea are very close culturally and geographically, the Korean education system is known for its emphasis on strict academic standards and being intensively competitive among students. It also has similarities with educational methods. Meanwhile, South Korea, like China, is an oriental country deeply influenced by Confucian ethics and has a strong tradition of emphasizing education. The belief that “education is the sole path to social advancement” is deeply ingrained in Korean society. Therefore, understanding the Korean education system can give Chinese students valuable insights.

Korean families pay great attention to their children's studies and spend a lot of time and money on their children's education. The potential competitive pressure on Korean families also motivates children to study hard, and they believe that achieving good grades can significantly alter their future for the better. Tang Zhe writes in his article 'An In Depth Analysis of the Training System and Integrated Teaching Mechanism for Top Talent Korean Pianists', that there are two ways to get music training. The first is through many music colleges and universities under the supervision of the Ministry of Education. The other is through the Korea National University of the Arts, established by Korea's Ministry of Culture, Sports and Tourism. It is the only institute that cultivates artists in South Korea. Its affiliated institute is called Seoul Arts Center, which resembles Juilliard's pre-college program in that it offers music lessons, classes, and performances only on weekends,⁵⁹ unlike middle schools and conservatories in China which provide both academic and music courses throughout the week. Right now, China is also starting to embrace this model of music institution. The pre-college program of The Tianjin Juilliard School offers music courses only on weekends. The school was established in 2019 and is the first overseas collaboration of The Juilliard School in New York.

Both Yunchan Lim and Seong-Jin Cho entered Seoul Arts Center at a young age,⁶⁰ and they improved tremendously while there. Cho mentions that:

“Every Saturday, we were given the chance to perform publicly, whereby we'd perform a piece in front of an audience. The students had to register for these performances personally, and in

⁵⁹ Zhe Tang, “An in Depth Analysis of the Training System and Integrated Teaching Mechanism for Top Talent Korean Pianists(深度剖析韩国钢琴拔尖人才培养体系与集成化教学机制——从‘第十六届范·克莱本国际钢琴比赛’冠军谈起),” *Piano Artistry*, August 2022.

⁶⁰ Van Cliburn Organization, “Yunchan Lim, 임윤찬, 2022 Cliburn Gold Medalist,” The Cliburn, n.d., <https://cliburn.org/yunchan-lim/>.

my eagerness to gain performance experience, I requested these Saturday concerts as much as I could.”⁶¹

After studying at Seoul Arts Center, he went straight to France to continue his studies. Unlike Cho, Lim entered the Korean National Institute for the Gifted in Arts after completing his studies at Seoul Arts Center and stayed in Korea before winning the Van Cliburn gold medal.

Starting in the 1980s, Korea began a tradition of sending students to study music overseas, with many choosing to go to the United States and Europe. An increasing number of students decided later to return to South Korea to continue their careers and become music teachers. These teachers constantly strive to improve themselves and attract students in the fiercely competitive field of Korean piano education. They are the main reason for the rise of the younger generation of Korean musicians. They exhibit a rigorous work ethic, display a passion for the piano, and receive endless parental support. Combined with their students' hard work, these teachers seem destined to cultivate outstanding musicians.

In addition, some large corporations provide strong support for Korean piano education. For example, Kumho, a company that manufactures tires, established the Kumho Musician Award, offering outstanding musicians a certificate of honor and a prize of 20 million KRW (roughly \$16,000). Winners are offered performances at the Kumho Arts Hall.⁶² The foundation regularly arranges for awardees to perform with top domestic and international orchestras. Moreover, it provides financial support for awardee to participate in international music festivals. Thanks to the

⁶¹ Young–Jin Hur, “In Conversation with Pianist Seong–Jin Cho,” *Primo Artists*, April 2, 2020, <https://www.primoartists.com/news/in-conversation-with-seong-jin-cho>.

⁶² Kumho Cultural Foundation, “The Highest Honors a Young Korean Musician Could Achieve, Kumho Musician Award,” www.kumhoarts.com, accessed March 21, 2024, <http://www.kumhoarts.com/eng/designer/skin/02/04.html>.

efforts of many parties, the level of piano education in Korea has continued to improve, and a number of outstanding pianists have emerged on the international stage.

Chapter 5.

Despite the significant progress made in piano education in China, many challenges and opportunities still need to be addressed. One challenge is the need for better quality piano teachers, especially those who can teach advanced levels. Ensuring enough skilled teachers to meet student's needs will be critical with the increasing demand for high-quality education. Given the acceleration of urbanization in modern societies, large cities usually attract more resources, and this has led to a trend of concentrating educational resources in large cities. Since they have more robust economies and abundant resources, big cities can provide more high-quality educational resources, including music education. At the same time, big cities attract more professionals, including music teachers and musicians. The arrival of these professionals not only improves the benchmark of music education but also enriches musical performances and provides students with broader learning opportunities. This is very much the case in China, whose cities host conservatories and attract music teachers and musicians. This situation provides students with learning opportunities that are better in quality and broader in scope. As mentioned earlier, there are currently eleven music conservatories in China, located in the cities of Beijing (There are two conservatories in Beijing, China Conservatory of Music and Central Conservatory of Music), Shanghai, Hangzhou, Guangzhou, Tianjin, Shenyang, Chengdu, Wuhan, Harbin, and Xi'an. These conservatories have state-of-the-art music teaching facilities and good educational environments that meet the learning and performing needs of students. In 2010, Steinway & Sons put the Central Conservatory of Music's School of Piano on its list of All-Steinway Schools, and the conservatory now owns 127 Steinway grand pianos and 41 Boston grand pianos. However, smaller cities and remote areas may be underfunded in terms of educational resources, and this can be particularly challenging for the relatively expensive and often one-on-one format of piano lessons. In these places, piano

learning can face several barriers, including the need for qualified teachers and the limited financial resources of students and families.

The breakthroughs achieved by technology companies in the piano industry have indeed revolutionized traditional piano education, offering innovative solutions that lower the barriers to learning. Rather than sticking to conventional teaching methods, these innovations aim to make piano learning more accessible and engaging for students. This not only provides students with greater flexibility in their practice process but also expands opportunities for individuals living in regions with limited educational resources. It is against this background that the invention of the Smart Piano was born. Harnessing the power of the Internet, the Smart Piano connects apps with smart devices and guides students to learn independently, thus reducing the difficulty of beginning to learn piano and making piano learning more enjoyable. In addition to instruction, daily practice is essential for students. Smart pianos play an important role here as well, providing an ideal way to meet the need for proper guidance during practice.

One of the most significant and transformative inventions of the 20th century is the Internet, which provides its users an enormous amount of information. The Internet has profoundly impacted virtually every aspect of modern life, from communications and education to business and entertainment. The Internet has also transformed the way we learn and experience music. There is a deep connection between the Internet and artificial intelligence (AI). The data and connectivity provided by the Internet powers AI, while AI enhances and optimizes aspects of the Internet, creating a symbiotic relationship between the two.

It has become increasingly evident from observing the new applications and functions that have emerged on the Internet over the last 20 years that there are growing similarities between the Internet and the brain's structure. Marvin Minsky (1927–2016) illustrates in his book that

emotions, intuition, and moods are not something distinctive, but that they represent a uniquely human way of thinking. Once we understand thinking, there is no fundamental difference between AI and the human brain. In other words, the human brain can be replicated in AI⁶³. Of particular interest about Minsky is that he was the founder of AI and a pianist who—according to his daughter, Margaret Minsky, a professor at NYU Shanghai—could improvise fugues.⁶⁴ In this chapter, I mostly cover the analysis of the current and future development of artificial intelligence (AI) in piano education.

Smart Piano and Smart Apps

In 2016, The ONE, a smart piano brand headquartered in China, launched The ONE Smart Piano Classroom, which focuses on making music learning possible without teachers. The Smart Piano Classroom brings this “future” model into the realm of professional music education. It teaches students to play by letting them learn at their own pace, in the convenience of their own homes, all without the guidance of a physical human teacher. The user need only connect the piano to a smartphone or tablet. In the app, students can hear a full demonstration of the piece before playing it. They can also watch the LED lights above the keyboard that synchronize with the notes and play along with the lights alone or engage with the visualizer that reacts to the notes being played in the game modes. They can play one note at a time, stop and go, or repeat difficult passages. Eventually, they can save a recording of their playing and share it with friends. The ONE is entirely student-controlled, and thus is motivating and entertaining at the same time.⁶⁵

⁶³ Marvin Minsky, *The Emotion Machine: Commonsense Thinking, Artificial Intelligence, and the Future of the Human Mind* (New York: Simon & Schuster, 2006).

⁶⁴ Margaret Minsky, “Preface to the online edition of *Music, Mind, and Meaning*.” 2013.

⁶⁵ “The ONE Smart Piano,” *American Music Teacher* 65, no. 2 (2015): 12.

Ye Bin, founder and CEO of The ONE Smart Piano,⁶⁶ said he regretted not learning music as a child. After becoming a father, he noticed that his son did not enjoy his piano lessons because he did not like practicing, and his friends' children had the same problems. Ye was convinced that learning music, especially piano, should not be painful, but rather enjoyable and exciting. He realized that there was something wrong with the current way of learning and was determined to change the situation. Through much research, Ye concluded that it would be possible to create a smart piano that would allow children to enjoy practicing. He realized that the use of virtual lights, along with a game model, could provide children with a more engaging way to learn, thus changing their attitude to and experience of learning music.

One great feature of The ONE Smart Piano is that it sources music from the classical repertoire for use within the app. Students can start with video lessons and choose some of the most popular online tutorials so that they can truly learn on their own. Of course, this learning method is not suitable for everyone; it is mainly geared for students who have had little previous training but have a high level of interest. However, The ONE Smart Piano may not provide the same level of personalized instruction as a human teacher, who can adjust the teaching approach to the student's strengths, weaknesses, and learning style. Despite the many features have been developed, such a smart piano cannot completely replace the human teacher's role.

In 2017, The Hi-Lite was introduced as a pioneering tool for learning piano that can convert any ordinary 88-key piano into a smart piano by The ONE Smart Piano.⁶⁷ Employing optical

⁶⁶“Ye Bin, the Founder of the ONE Explains How He Developed the Smart Piano.创业十年，不忘初心， the ONE CEO 叶滨细述研发智能钢琴始终-清华校友总会,” www.tsinghua.org.cn, November 12, 2018, <https://www.tsinghua.org.cn/info/1953/13633.htm>.

⁶⁷ “The ONE Music Group; the ONE Music Group Announces New Product to Bring Music Education to More Homes and Consumers of All Ages, Skill Levels,” *Journal of Engineering*, 2017, 1480.

sensor technology installed above the piano keys, Hi-Lite is a device that can be attached to a piano or keyboard to help students learn how to play. The sensor tracks the movement of the keys and sends the data to a computer or mobile device, which then displays the corresponding notes on the screen. The sensor also illuminates the keys in different colors to indicate which keys to play for a particular song or exercise.

FIND Smart Piano is another rising smart piano brand in China whose full-sized display I find intriguing. FIND Smart Piano includes a large screen displaying 88 keys in real time; it also features an intelligent interactive interface, automatic accompaniment and muted playing, multiple pedals for page-turning and speed adjustment, dual cameras for real-time analysis of playing status and mood, and AI coaching. These features dramatically improve the efficiency and convenience of learning, playing, and appreciating the piano. Whereas The ONE Smart Piano appeals to all ages and is designed for music enthusiasts who are self-motivated, FIND Smart Piano is oriented towards a customer base of young beginners as a complementary teaching resource.

The strongest aspect of FIND Smart Piano is its advanced technology and intelligent interactive interface. The instrument is equipped with dual cameras and an AI coaching function that can analyze every detail of the playing in real time and provide guidance and suggestions. In addition, the FIND Smart Piano can enable hands-separate practice by automatically playing the music of the hand that is not being played. For many piano students—especially younger ones—the slow, hands-separate practice method can seem extremely intolerable. With this AI-intelligent piano, practice becomes more exciting and efficient. As smart pianos, The ONE and FIND offer many similar features despite their differences. They both feature smart piano technology that allows for self-learning through connected smart devices and offer many practice

and learning features to help users learn the piano. Hi-Lite can be employed with whatever piano the user has, whereas the other two are standalone devices. Overall, the overlap among the three is that they all use smart devices to some extent (e.g. connecting an iPhone) to access content. However, the look and design of both The ONE and FIND Smart Pianos are totally different: The ONE looks more like a traditional digital piano, whereas FIND looks more like a digital piano with a giant screen in place of a fall board. In addition, the two devices vary considerably in price: FIND Smart Piano is more expensive and currently only offers three different models ranging from roughly \$10,000 to \$30,000, while The ONE Smart Piano is more affordable and currently has eight different models ranging from \$200 to \$1,300. It appears that The ONE Smart Piano has streamlined its product offerings to focus exclusively on The ONE Smart Pianos and has discontinued the Hi-Lite device.

As just mentioned above, The ONE and FIND are both brand-specific systems that are designed to work with their specific smart piano brands, offering integrated features and functionalities. On the other hand, Flowkey and Yousician are app-based systems that provide flexibility and accessibility across different devices, allowing users to choose their preferred learning platform regardless of the keyboards they own.⁶⁸ The price is also very attractive, with Yousician being much more affordable than either private lessons or the purchase of a smart piano such as The ONE. As of April 2024, Flowkey offers an individual plan at \$19.99 per month or \$119.88 annually; meanwhile, Yousician's individual plan is priced at \$11.66 per month or \$139.99 annually. This is much less expensive than in-person lessons and more

⁶⁸ There are other systems, such as Pianote and Hoffman Academy, but the current discussion is limited to Flowkey and Yousician.

attractive to families who view piano lessons as something more akin to an enjoyable hobby than to a serious commitment.

Unlike *The ONE* and *FIND*, which have smart features built into the pianos, *Flowkey* and *Yousician* are apps that can be downloaded to personal devices. One can use an acoustic grand or upright piano, or a keyboard that can be plugged directly into the device. The device's microphone can pick up notes heard on the acoustic piano; it can also detect notes on a keyboard either through its speakers (or through an external amplifier), or via MIDI notes if plugged in directly to the device from the keyboard. Both apps display the notes recognized and indicate wrong notes and incorrect rhythms. The apps can also subsequently rate the student's performance. Although *Flowkey* and *Yousician* are similarly described as online learning apps, their features and emphases are quite different. *Flowkey* offers piano lessons only, and its main selling point is its vast library of song collections. *Yousician* is a game-like music app for innovative self-learning that offers lessons for piano and other instruments such as guitar, ukulele, bass, and voice. Unlike other apps, the student cannot access all the material at once with *Yousician* and must instead finish the task at hand to unlock the next level.

Although these apps use a copy-and-play learning approach, each has different features to motivate students to learn. Some include video game-style learning that rewards fun and knowledge acquisition at the same time. Others allow users to share in community forums how often and how much time they spend practicing. However, none of the apps offer advanced-level instruction, nor are they marketed as substitutes for the kind of feedback that comes from a piano teacher in one-on-one private lessons. A teacher sitting beside the student can, for example, see specific technique problems and adjust them quickly.

The ONE and FIND smart piano apps are thus better known in the Chinese market and therefore mainly target Chinese-speaking users. Chinese consumers are willing to invest financially in their children's education, and these companies have responded by developing apps deliver combine pedagogical content via a keyboard or acoustic piano. By contrast, Flowkey and Yousician focus more on English-speaking users, and because these parents mainly want their children to have fun, these companies' apps provide content and lessons more in line with music education that emphasizes the importance of encouragement. These apps thus focus more on variety of content and less on hardware integration. This distinction reflects the needs and cultural differences of different markets.

Video platforms such as YouTube and Vimeo also provide a very effective way to learn. While they may be challenging for students who do not have basic knowledge, such platforms provide amateur but more experienced piano students a convenient and flexible way to learn. Amateurs can access a wide range of piano instruction videos and performance demonstrations anytime and anywhere through the video platform. These videos cover everything from basic knowledge to advanced musicianship and techniques, and students can choose the right content to learn according to their needs and interests. In addition, the content on video platforms is usually free, making the cost of learning much lower.

Learning piano through a video platform offers a great deal of flexibility, as students can learn at their own pace and do not have to follow a strict schedule. They can watch the video content repeatedly until they are satisfied that they have mastered the repertoire. This type of self-directed learning gives students more freedom to explore and develop their musical interests without the constraints of time and place. Granted, learning piano on a video platform may lack personalized instruction and feedback, and students may feel defeated when struggling. But, by

actively using the resources available on video platforms, amateur piano enthusiasts can continue to improve their skills and enjoy the fun and satisfaction of piano music. For example, British classical pianist Paul Barton has over half a million subscribers to his YouTube channel, where he provides free tutorials and interpretations of Classical music masterpieces. After deciding he did not want to make performing his life's career, he began producing videos, and over the past decade has created over 1,200 classical piano music tutorials, all of which are free to access. Even though he may not be a performer of the caliber of Horowitz and Rubinstein, Barton is a professional who makes informative videos, and because his content is available to everyone, he brings curiosity and excitement about classic music to music lovers and piano students alike. What is more vital is that—perhaps because of Barton's YouTube presence—a growing number of professional pianists have similarly begun to share their performances and communicate their experience and ideas with audiences.

While smart pianos, online learning apps, and video platforms offer many conveniences and resources for piano learning, they really cannot completely replace a one-on-one private piano teacher. Private lessons can offer many advantages, especially when it comes to providing advanced instruction and personalized feedback. In one-on-one private lessons, a piano teacher can pay close attention to a student's playing and observe their technique and performance in real time. This allows the piano teacher to quickly identify any problems the student may be having and provide targeted feedback and instruction. By interacting directly with the student, the piano teacher can adjust their teaching approaches and lesson content based on the student's progress, ensuring the most effective learning experience for the student.

The dialogue between teacher and student is also significant. In addition to imparting skills and knowledge, private lessons provide a means of building trust and interaction. In private

lessons, students can develop a close relationship with their teacher and feel surrounded by a supportive environment. Students can also share their concerns, challenges, and goals with their teacher, who in turn can listen and offer expert advice and support. This open dialogue helps students develop confidence and furthers their motivation to learn and grow. At the same time, teachers can learn about students' growth, personal preferences, and goals through dialogues with them and thus adapt their teaching approaches and lesson content to meet students' needs.

The following chart summarizes the pros and cons of Online and In-Person learning approaches:

Online Learning	Pros	Cons
	<ul style="list-style-type: none"> ● Affordable, generally cheaper than in-person lessons. ● Fits a wide variety of personal schedules. ● Abundance of free lessons via platforms like YouTube. ● Video game-style learning (e.g., Yousician) that is enjoyable, provides note- and rhythm-recognition feedback, and rates student performance. ● Student controls the learning pace. ● Flexible, useful features such as show/hide fingerings, control tempo of demo playing, and hands-separated practice. ● Instruction in theory and musicianship skills. ● Activity profile that shows how often and how much time the user spends in practice. 	<ul style="list-style-type: none"> ● Learning approach is not clearly delineated. ● Video game-style learning does not allow skipping levels and is sometimes difficult to navigate. ● Superficial instruction that does not explain in depth the issues one may have in practice. ● Cannot answer questions students may have during the lesson. ● YouTube: difficult to know where to begin and unfriendly for beginners. ● Yousician: user must strictly follow the course plan, not allowing the user to navigate the content. Users cannot skip levels and must work on songs they do not enjoy.
In-Person Learning	Pros	Cons

	<ul style="list-style-type: none"> ● Individual time with the instructor. ● Timely feedback from the instructor. ● Human interaction that simulates the atmosphere of performance. 	<ul style="list-style-type: none"> ● Expensive when compared to online lessons. ● Required time commitment.
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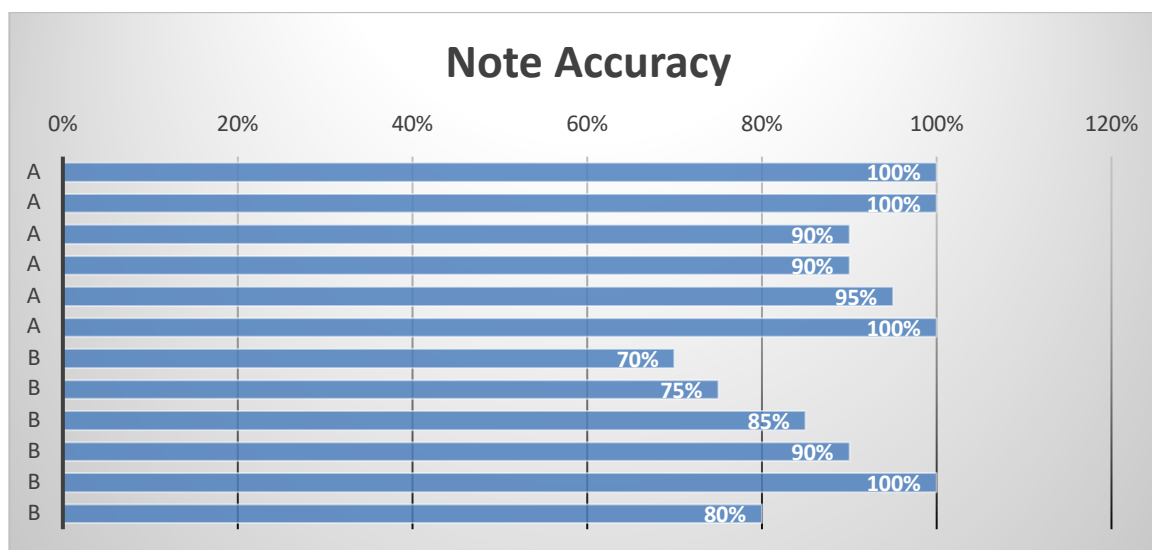
In-person teachers can never be replaced by the smart piano because machines can only process data; real piano technique and artistic feeling can never be represented by data that is delivered to the students. Moreover, the knowledge that an experienced teacher instills in a student is not limited to the narrow confines of correcting wrong notes and rhythms. A good music teacher uses his or her skill and personality to influence the student to more thoroughly perceive the beauty of the art. Thus, even if smart pianos are further developed, they cannot completely replace traditional teaching methods and the personal interactions that take place between a teacher and student. Diane Pitman,⁶⁹ a professor of computer science and senior scientist at the University of Pittsburgh, notes that “there’s a lot of excitement about AI. One misconception is that people want to use AI to replace teachers and other workers, but that’s not at all where the research is headed.”⁷⁰ There is clearly still a long way to go to determine how much AI should be used in piano education, even though the prospect of using AI technology is promising.

While it is unrealistic to expect AI to replace teachers with smart pianos and apps, it can be a useful tool to help students practice. Real-time feedback can be of great help during daily practice. By pointing out errors in a timely manner, smart pianos can help students correct their mistakes immediately and avoid forming bad playing habits.

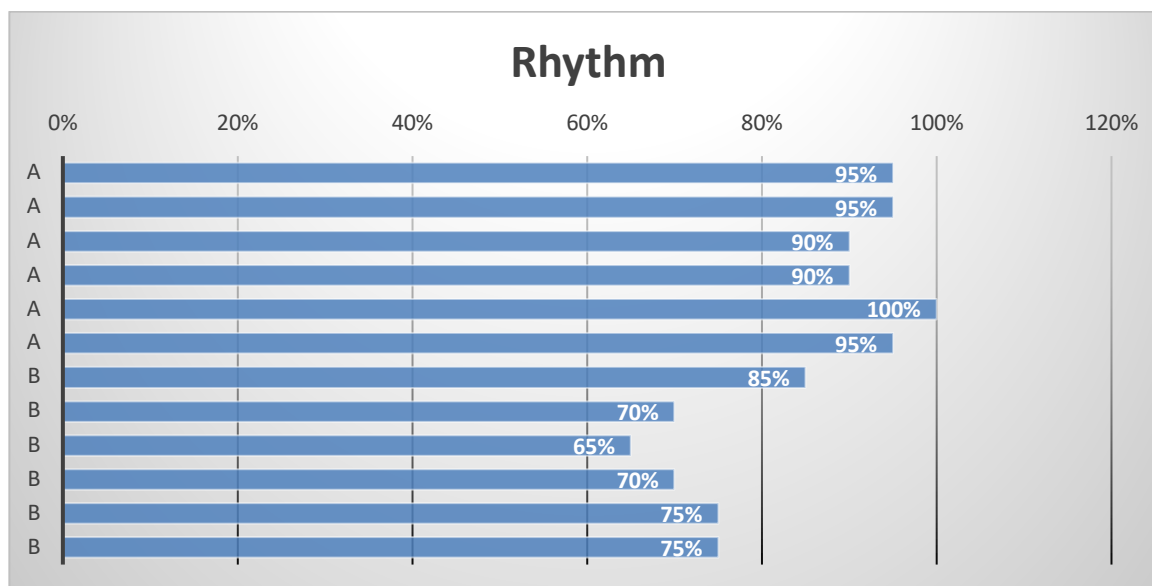
⁶⁹ Diane Litman, professor in the School of Computing and Information and senior scientist at the Learning Research and Development Center (LRDC)

⁷⁰ University of Pittsburgh, “What Will the 2020s Bring for AI?” University of Pittsburgh, December 13, 2019, <https://www.pitt.edu/pittwire/features-articles/what-will-2020s-bring-ai>.

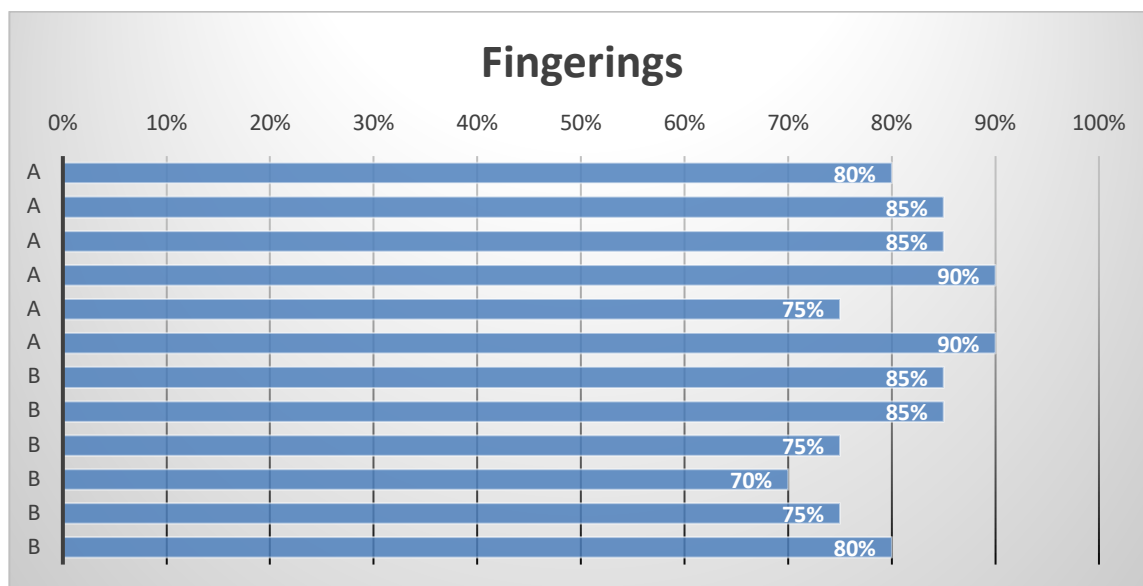
To test this idea, I conducted a small group experiment to show the practical effects of smart piano practice, and in particular to determine the efficiency and quality of using a smart piano for daily practice versus practicing alone. I selected twelve of my piano students, ages 7 to 10, including six girls and six boys, all of whom were at a similar level of availability. Each student received a weekly 30-minute private lesson with me. I then assigned them a week's homework of the same repertoire, *Clementi's Sonatina in C Major, Op. 36, No. 1, First Movement*, bars 1-23 (exposition and development sections). Six students practiced with The ONE Smart Piano app (marked with an "A" in the figure below); the other six (marked with a "B" below) practiced as usual, without the Smart Piano app. I also created four categories—Note Accuracy, Rhythm, Fingerings, and Dynamics—to grade their performance in the next lesson. I subtracted 5 points from the maximum 100-point score whenever a student made a mistake.



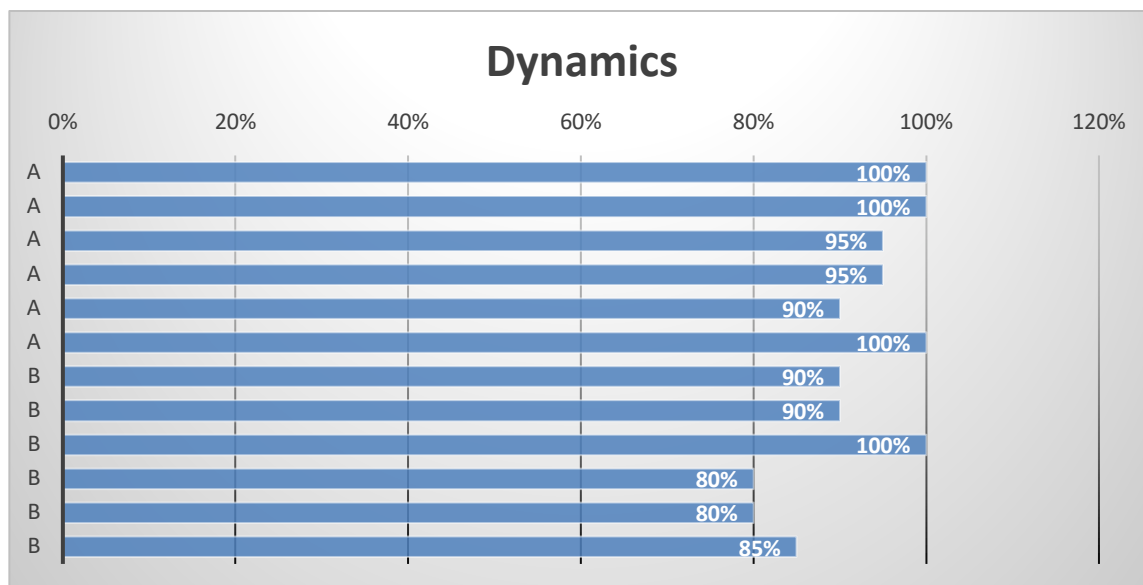
In terms of note accuracy, the group of students who practiced with the app scored higher, presumably due to the app's note recognition feature, which helped them immediately correct note errors. Three students in Group A made no mistakes, compared to only one in Group B.



Rhythm is generally challenging for most students, and they tend to need help identifying their mistakes, which may be due to a lack of musicianship or unfamiliarity with the work. The students in Group A scored significantly higher, again presumably because of the immediate feedback they received from the app, which can detect rhythmic errors. This smart piano-centered approach should save time, especially compared to the students who did not receive such immediate feedback and thus practiced unaware of their mistakes, likely forming the wrong muscle memory. I found that helping students fix rhythmic mistakes took more time than any other aspect studied in general, and establishing a correct sense of rhythm saves a lot of time in lessons. Students who received feedback from the app felt less stress and frustration when correcting rhythmic mistakes and were more confident because they made fewer mistakes.



The interesting revelation from the data on fingerings is that the two groups are surprisingly similar. Even though there are fingerings in the app's music, the students seem to neglect them about as frequently as they neglect the printed music. However, the participants in this experiment were children, so the results may have been different if the test had been conducted with adult students. In addition, the results didn't take into account whether the students had a strong reason for a changing the fingerings rather than subconsciously altering the fingering.



Prior to this experiment, my assumption about dynamics was that there would be little difference between Group A and Group B. However, because the students in Group A were constantly having the chance to listen to the demo recording while practicing with the app, they seemed to deepen their impression of the music and develop a better sense of musicality. This is not unlike the Suzuki method, which posits that frequent listening to music—even before recognizing the notes—mimics how young children learn to speak words. Thus, listening to a recording while practicing may be more beneficial for the young beginner, but it may be optional for older students.

Of course, this is just an observation from one lesson and does not indicate that practicing with a smart piano is necessarily superior to practicing without it. The current state of development of smart pianos makes them something like an intelligent tutor; over the longer term, this may form a kind of dependency that runs contrary to the idea of truly understanding how to practice. It is therefore important to control the extent to which smart pianos are used to ensure that they are a useful addition to the learning process rather than a dependency.

In a typical piano lesson, a teacher generally spends most of the lesson explaining problems of rhythm and note recognition to younger students. Because their mental and physical development is not yet matured, their comprehension and ability to control their hands are far less developed than that of adults. A smart app can be used as a daily practice accompaniment for common issues and reduce the probability of wrongly executed exercises. With the time savings earned from in-app correction of wrong notes and rhythms, the teacher can spend more time on other aspects of music. Since China now leads the world in the number of children learning the piano—with approximately 30 to 40 million children taking piano lessons—smart

piano apps continue to be popular as piano practice tools.⁷¹ However, challenges remain for students. In particular, using the Internet and smart piano apps places a higher demand on students' self-control. Since the smart piano app is usually used in conjunction with an electronic device like an iPad or smartphone, students with poor self-control can easily divert their attention and play games or other non-piano-related activities. Such temptations can be challenging for these students.

Real-time feedback with practice is an entry-level approach to utilizing the potential of AI, and there are more possibilities yet to discover. I stumbled upon an app called Pandora, developed by Pandora Media, which allows users to enter the name of a favorite song or artist and have the app play songs of similar style. Users' feedback on each song, in the form of likes or dislikes, influences Pandora's subsequent song selections. The core of the program is the Music Genome Project, whose idea is to break down each section of a song into a number of elements, or “genes,” that describe the song's melody, harmony, rhythm, instrumentation, score, arrangement, and so on. Based on this analysis, the Pandora app can recommend other songs that share similar features. By using AI programs to analyze specific elements of a piece of music, such as motifs or themes, and then comparing their similarities to works by other composers from the same period, students can develop a deeper understanding of the music and its historical context. This in turn can help students better understand the styles and influences of different composers and create better interpretations of the music they perform. In addition, apps like Pandora can stimulate students' interest in music history and musicianship and promote their exploration and understanding of music. Taken together, the use of Pandora would indeed add more appeal and educational value to learning tools such as smart pianos.

⁷¹ Ren, “Steinway & Sons Upbeat on Hitting the Right Notes.”

Compared to pop song analysis, the analysis of classical music works requires large amounts of data and complex algorithms. Classical music repertoires are usually composed of many different elements, such as themes, melodies, harmonies, rhythms, and so on. In addition, because number and variety of classical music works is so large, a lot of time and resources would be required to build an effective analysis system. Nevertheless, such a development would be a revolutionary step that could change the way we learn and appreciate classical music. If the future development of the smart piano could be adapted to include this AI feature, students' understanding of the music they study would benefit from the scientific analytical approach that such apps might use.

Content Generation

In the past, composers had to spend many hours studying and analyzing music, not to mention considerable time practicing, to create masterpieces. Even Mozart is said to have studied Bach and Handel diligently and was known to have many works of great masters lying on his desk.⁷² However, today's computer algorithms can nearly instantaneously compose music. To celebrate the 334th birthday of Johann Sebastian Bach, Google launched an interactive Google Doodle called the "Bach Doodle" on March 21, 2019.⁷³ Emphasizing the intersection of art and technology, Google doodles are often used as an entertaining and educational way to engage with the user. The Bach Doodle was designed to be both fun and educational, and it allowed users to create their own compositions using an interactive interface that incorporated elements of Bach's music and style. Bach's music was, as a matter of fact, an exemplary resource for

⁷² Otto Jahn, *Life of Mozart, Vol. 2 (of 3)* (Project Gutenberg, n.d.), 416.

⁷³ Cheng-Zhi Anna Huang et al., "The Bach Doodle: Approachable Music Composition with Machine Learning at Scale," *ArXiv:1907.06637 [Cs, Eess, Stat]*, July 14, 2019, <https://arxiv.org/abs/1907.06637>.

machine learning because its melodies and harmonies were based on motives that are played in different voices. The Bach Doodle could generate music very similar to the style of Bach by creating the user's melodies and composing with them. As a musician myself, I find less interesting the similarity of Bach Doodle music to the music of Bach himself than I do the way the doodle analyzes and collects data. To me, this parallels how we learn music: we interpret scores by practicing them, and then we strengthen our understanding of music by studying different works from the same composer. This seems similar to how the "Bach Doodle" learns authentic Bach music.

Another product, AI Duet, is an interactive artificial intelligence music experiment developed by Google's Creative Lab. It utilizes machine learning and artificial intelligence to generate music based on user input. AI Duet plays the piano based on the notes or melodies the user provides. AI Duet's founder Yotam Mann states that it uses an artificial intelligence model known as a neural network, which originates from Google's open-source Magenta project. He defines various rules for how it responds to user input. For example, if the user plays a note C, the AI responds by moving up to G; if the user plays an ascending sequence, the AI responds with a descending phrase. Over time, it accumulates a vast amount of information and can generate music on its own. Clearly, AI Duet is not a mature market product but merely an experiment combining machine learning and music composition. What intrigues me is not so much the ability to interact with the AI but the fact that the model could perhaps one day have collected enough data to help us improve our ability to analyze musical scores. For example, a Bach motif could be analyzed by AI and powerful algorithms to help us find hidden motives in

all Bach's compositions, including choral, string, and keyboard works.⁷⁴ Moreover, AI could help us compare motives in different works, and this would help musicians better understand Bach's compositional process and development as a composer.

Meanwhile, an interesting idea is to combine the content-generating capabilities of AI with smart pianos through algorithms. For example, when a beginner student plays a simple monophonic melody, the smart piano could provide accompaniments at different levels of difficulty, depending on the child's level and preferences. Similar to the teaching method of Faber Piano Adventures, they provide background accompaniments featuring the instrumentation of the marching band, Baroque chamber, jazz ensemble, etc. This approach allows children to be exposed to a wide range of musical content in different styles and difficulty levels in advance, developing their listening experience and musical aesthetics without being constrained by the current pace of learning. This innovative approach helps to stimulate students' interest and promote their musical development.

Even more astonishing is AI's storage capacity, which is unlimited and is continually expanding. In spite of this, AI is not yet fully capable of replicating the incredible complexity of the human brain. Combining AI with music is still in the nascent stages of experimentation and exploration. Admittedly, AI has made some impressive musical achievements, but there are still many challenges, including understanding the emotional and affective expression of music. Generating accompaniments through the smart piano and associated apps can be very beneficial, especially for younger beginners. In particular, students may want to explore melodies by ear or play songs not provided with a teaching method. Improvised accompaniments by AI during

⁷⁴ The motif is from his name and four notes are Bb, A, C, and Bb, and in German, the letter H stands for Bb, and B stands for Bb.

practice not only add interest to the exercises but also help students better understand the harmonies of music.

Interactive Learning Platforms

There are smart pianos and apps not only for beginners or self-taught piano students but also for students majoring in piano performance. For example, Tomplay is a suitable app for professional piano students that offers a wide range of classical and contemporary piano scores to meet the needs of students of all levels. Tomplay has an extensive library of scores covering various difficulties and styles, allowing users to search and download scores by composer, genre, difficulty level, or instrument. In addition, Tomplay offers accompaniment tracks, which are great practice and performance tools for advanced-level students. Because of its comprehensive library of classical music scores, Tomplay has become a practice tool many pianists repeatedly use for piano concertos and chamber music. This app includes famous piano concertos by composers such as Mozart, Beethoven, and Rachmaninoff and features high-quality recordings of accompaniments from classical music record label Deutsche Grammophon⁷⁵ that allow users to practice with excellent symphony orchestras. This feature also enables the user to play the orchestra parts without the sound of the piano. Additionally, the app's performance tempo adjustment feature allows users to modify the tempo to their needs by either slowing down or speeding up the tempo of the recording. Overall, Tomplay is an incredibly useful and practical application. As of this writing, Tomplay has been adopted by more than one million musicians

⁷⁵ Tombooks LLC, "Deutsche Grammophon and Tombooks Bring Interactive Music Learning to Revolutionary Education App Tomplay," PR Newswire, November 29, 2017, <https://www.prnewswire.com/news-releases/deutsche-grammophon-and-tombooks-bring-interactive-music-learning-to-revolutionary-education-app-tomplay-660740733.html>.

from 157 countries, and its partnership with Yamaha has the potential to further enhance its reach and its sales.⁷⁶

Online Learning

Tomplay is a non-real-time resource in which all material is recorded in advance. Online courses that take place in real-time mode involve students and teachers who are online at the same time, with teaching given through real-time communication. The earliest online distance learning program began in 1996 with Christianne Orto, then director of the Manhattan School of Music (MSM) in New York, and violinist Pinchas Zuckerman.⁷⁷ Since Zuckerman needed to relocate, he could no longer teach his students in person, and he was reluctant to give up his students at the school. Therefore, Dean Orto came up with the idea of distance learning, which was quickly implemented. David Marsh mentioned that the system developed by MSM could provide the maximum possible restoration of the original sound,⁷⁸ and solve the problem of sound quality transmission in online music education.⁷⁹ This equipment has been continuously improved over the past ten years, especially to solve the problem of delay in live remote broadcasting, which can now be to only 0.5 seconds or less. In terms of equipment, installing a PC device is more demanding on the teacher's end because it requires a specialized microphone

⁷⁶ Yamaha Music Europe and Tomplay, “Yamaha and Tomplay Start Partnership to Transform Musicians’ Daily Practice into a Unique Experience,” PR Newswire, July 25, 2022, <https://www.prnewswire.com/news-releases/yamaha-and-tomplay-start-partnership-to-transform-musicians-daily-practice-into-a-unique-experience-301591624.html>.

⁷⁷ Manhattan School of Music, “The Orto Center’s Distance Learning and Digital Education Programs Connect Students, Educators, and Distinguished Artists around the Globe.,” Manhattan School of Music, n.d., <https://www.msmnyc.edu/programs/distance-learning/>.

⁷⁸ David Marsh is the Assistant Director of the Orto Center, Distance Learning and Recording Arts at MSM.

⁷⁹ Ti An, “Longing for the Spring of Online Music Education (在线音乐教育的春天还有多远?),” Piano Artistry, April 2020.

and external speakers. The students on the other end don't need to buy separate equipment as long as they have a projector. This is a classroom instruction situation that is taught by an instructor far away by Internet.

This mode of teaching is more like what we usually have in our piano lessons, and it places high demands on the bandwidth and stability of the network used for such instruction. When the network is congested, video and audio clarity may be significantly compressed to ensure continued communication, resulting in blurred, delayed, or even stagnant video and audio. This may be acceptable if it occurs occasionally during a lesson, but if the problem occurs frequently, it can disrupt the continuity of the lesson and the quality of teaching. We often think that simply speeding up the network will solve this problem, but the truth is far from simple. A good technical infrastructure must be emphasized for practical remote tool training in situations where face-to-face instruction is impossible. Audio feedback, or echo, is a recurring problem that can greatly affect the flow of instruction. Therefore, high-speed Internet connections and well-equipped computers are necessary, as well as good audio equipment, including headphones, speaker monitors, and microphones.

Unlike the violin or other instruments, the piano has a higher degree of adaptability when it comes to online lessons, and Yamaha's Disklavier is an ideal example of this. Yamaha Disklavier pianos are based on Yamaha's high-quality acoustic pianos and have been developed to produce exceptional sound and advanced automatic playing systems. There are currently four models: first, the DKC-900, a hardware upgrade primarily intended for compatibility with the previous E3 generation Disklavier. Next, then there is the Enspire series, the latest series of automated pianos released since 2016 to replace the E3 generation; this currently includes the Enspire CL (Classic), which primarily features a playback system. Finally, there is the Enspire St (Standard)

and the Ensfire Pro (Professional), the latter of which has been enhanced from the former to provide an outstanding musical experience for recitals and other high-level musical performances.

Both models are equipped with optical sensors to accurately measure the movement data of each keyboard as it is played. This means that every subtle keyboard movement is recorded without any time delay, preventing rhythmic confusion problems during recording. In addition, the key sensor and hammer sensor accurately measure the actual velocity of each hammer during a performance, as well as the speed at which the key is released. In addition, the pedal function has been greatly improved, and instead of only providing two values, on and off, it can now record a wide range of different levels of pedal action, from all the way down to half the pedal range to all the way up. Today, the Yamaha Disklavier is the first choice for professional use in playing and teaching. Not surprisingly, most of Yamaha's marketing efforts are aimed directly at these organizations providing these services, such as the University of Kansas,⁸⁰ the University of Oregon,⁸¹ and the University of Alabama at Huntsville,⁸² which have already purchased and arranged distance learning programs. The Disklavier is popular in not only the United States but also China. In 2023, Inna Faliks, Professor and Head of the Piano Department at the UCLA Herb Alpert School of Music, conducted a master class at Los Angeles with students from the

⁸⁰ Meghan Spreer, "New Technology to Provide Remote Piano Lessons for Rural Elementary Students," KU News, April 24, 2015, <https://news.ku.edu/news/article/2015/04/24/new-technology-provide-remote-piano-lessons-rural-elementary-students>.

⁸¹ Jim Murez, "New High-Tech Piano Connects UO Players with the World," around.uoregon.edu, May 8, 2020, <https://around.uoregon.edu/content/new-high-tech-piano-connects-uo-players-world>.

⁸² UAH Department of Music, "UAH - College of Arts, Humanities, & Social Sciences - UAH's Internet-Connected Yamaha Disklavier Is Revolutionizing Piano Instruction," www.uah.edu, October 18, 2018, <https://www.uah.edu/ahs/departments/theatre-film/news/13371-uahs-internet-connected-yamaha-disklavier-is-revolutionizing-piano-instruction>.

Zhejiang Conservatory of Music in China, using only two Yamaha Disklavier pianos on which performances could be viewed in real time.⁸³ Moreover, Yamaha Remote learning currently conducts regular remote masterclass programs in China with six conservatories and five universities through the University Remote Art Education Union.⁸⁴ In addition, this program cooperates with the e-Remote Art Education Union in 18 different cities in China, as well as with local music studios.⁸⁵

A good example of Yamaha Disklavier instruction is that which occurs between Dr. Pike and her student, Isabelle.⁸⁶ Pike began working with Isabelle's mother, Kristin, in 2010 on a small research project to teach beginning sight-reading skills via Internet MIDI and digital piano. Soon after, she began teaching Isabelle 30 minutes per week, and because Isabelle progressed so quickly, she changed Isabelle's lessons to 20 minutes per lesson, twice a week. Two years later, in 2012, Pike and Isabelle began using the Disklavier acoustic piano, along with a computerized link that allowed them to watch each other play their respective pianos. Because the Disklavier offers a more advanced listening experience than that of other digital pianos, Isabelle said she could feel changes in dynamics and articulation as though they were in the same room for the lesson.

⁸³ UCLA Herb Alpert School of Music, "Disklavier Remote Piano Masterclasses with Zhejiang Conservatory in China," The UCLA Herb Alpert School of Music, October 3, 2023, <https://schoolofmusic.ucla.edu/event/disklavier-remote-piano-masterclasses-with-zhejiang-conservatory-in-china/>.

⁸⁴ University Remote Art Education Union (REU) aims to share high-quality resources among the union's institutions. Within the union institutions, it offers remote master classes, remote teacher training, remote concerts, and other teaching and research activities through Yamaha Disklavier.

⁸⁵ Yamaha, "REU Distance Art Education Union - Yamaha China," Yamaha, accessed May 7, 2024, <https://www.yamaha.com.cn/minisite/eu/reu.html>.

⁸⁶ Pamela D Pike and Isabelle Shoemaker, "ONLINE PIANO LESSONS: A Teacher's Journey into 21st Century Virtual Teaching Environment," *American Music Teacher* 65, no. 1 (2015): 12–16.

Of course, it's not that Dr. Pike only offers distance lessons only, it's just that distance lessons are still very viable in a program like Isabelle's. Isabelle is very punctual and never misses a lesson because of the weather, even though she lives in Minnesota, which receives a lot of snowfall in the winter. She also playing duets and other music on Disklavier on her own, and although some of these are not assigned to her, she is very willing to explore them on her own, thus increasing her motivation to learn the piano.

Finally, Pike stated that she had never met Isabelle in person; she had never sat together at a piano with her. Nevertheless, she had learned over the years through Isabelle's online lessons about her student's growth on the piano, her sense of humor, and her willingness to try new things. Even though there are indications that certain social cues crucial for personal interaction might be absent in online instruction, when student and teacher are attentive and fully engaged in synchronous online lessons, the interpersonal signals essential to effective communication and relationship building apparently remain intact.

While this online learning model is not entirely driven by AI, it does offer possibilities for future developments and breakthroughs. For example, virtual reality (VR) and augmented reality (AR) technologies certainly lead in a compelling direction. These technologies can provide students with a more interactive and immersive learning experience. Virtual reality technology can create a new virtual environment that makes students feel as if they are in a real concert hall or music studio. For example, if a student has a piano performance in the near future, he or she can simulate that concert environment. Surrounded by a virtual audience during practice, the student can gain confidence in performing in front of a real audience. Moreover, through devices such as VR helmets and cameras, teachers and students can conduct lessons in the same virtual space even though they may be some distance from one another. AR technology can further

enhance such learning by overlaying virtual elements in the real world, creating an augmented-reality experience for students at the piano. Through AR apps and smart devices, students can learn and practice interactively by seeing virtual notes and instructions overlaid electronically onto a real piano keyboard.

Smart Piano in China

Over the past few years in China, several new tech companies have launched a dozen smart piano apps that utilize AI algorithms to recognize and correct inaccurate notes and rhythms. These apps provide features such as demonstration videos, music theory lessons, and practice evaluations. To attract more users, these companies have created AI algorithms that have become the core components of their smart piano apps. Since they are so central to the apps' functioning, these algorithms need to continuous improvement and maintenance. These companies are also faced with the need to attract more talent to join their staffs. All these concerns require a large amount of capital investment. In addition, these companies' current business models are unprecedented in China, so it fair to say that this sector of the smart app landscape has not reached a mature stage. For investors, profitability is a key consideration, but the profitability of these companies is yet unproven. While short-term losses may occur, the focus for companies and investors alike should be on long-term profitability. Smart piano apps currently generate revenue through subscriptions, advertising, and paid courses. Evaluating the feasibility and potential of these profit models is therefore crucial for investors.

To increase profitability and grow their smart piano business, this new set of companies has chosen to strengthen partnerships with music studios and piano teachers across China. Such partnerships—which include hiring real teachers to teach online lessons—may increase these

apps' exposure and hopefully attract more students to use them. This approach may provide more opportunities for students who prefer in-person teaching to automated smart piano apps, and this may in turn increase these companies' profits. Yet another option exists in opening retail stores in major cities like Beijing and Shanghai, through which app companies could cooperate with piano manufacturers to provide services such as teaching and performance venues that may attract more students. Such direct engagement may increase these apps' retention and loyalty, thereby increasing profitability.

In the early stages of development, a company may rely on the capital provided by financing to gain market share at low prices or even to advertise heavily and operate without making a profit. Sometimes companies may even offer price concessions by encouraging subscribers to pay annual fees in advance. However, such strategies are not a long-term solution. Once the price of service increases, these companies risk losing customers. More importantly, the money raised from users' prepayments is not necessarily stable. Although such revenue can be used to expand business and remediate insufficient cash flow, prepayments are based on consumers' trust. If revenue is stable, consumers can enjoy the services they have already paid for. However, if revenue is unstable or disrupted, the entire service can collapse, and companies can quickly fall like dominoes.

VIP Peilian,⁸⁷ China's largest online piano practice company, revealed in 2022 that it was unable to make regular payroll payments, crippling the company's operations. Parents began demanding refunds, only to find that the company could not pay them back. Eventually, the company went bankrupt and was acquired by another company, making it impossible to continue

⁸⁷ Rahul Maheshwari, "Negative Working Capital Fallacy - VIP Peilian's Fall," OldRope, July 4, 2022, <https://www.oldrope.club/p/largest-music-learning-platform-is>.

operations. Similar situations have happened to other companies in recent years. Indeed, over the past decade, many companies have aggressively entered the digital piano industry and invested large amounts of money to expand their market share. However, due to excessive competition, some have gone bankrupt due to capital chain rupture, management problems, or insufficient market research.

To prevent similar future occurrences, a regulatory agency should step in to ensure a healthy market. The pursuit of future growth should not come at the expense of the status quo, especially for users and consumers. Negative news can damage a company's reputation, especially if users, unaware of the challenges these companies face, become wary and refuse to use smart apps.

Overall, the emergence of smart pianos has had a definite impact on traditional piano education, but at present the integration of smart piano and AI features is still at an early stage and thus cannot completely replace traditional piano education. In the short term, traditional piano education will remain the mainstream form of instruction. Nevertheless, considerable progress has already been made with the development of AI, the creation of databases rich in educational materials, and the constant updating of algorithms and machine learning. With applications that collect user habits and information, smart app piano lessons can provide the primary data for future upgrades in smart piano and AI technology.

Such benefits notwithstanding, smart pianos still have some disadvantages and limitations. First, the initial high manufacturing costs and sales prices of smart pianos are not dissimilar to the situation Tesla faced with its first model, the Roadster. Like Tesla, smart piano manufacturers may need time to optimize their production processes, reduce costs, and scale up production to make their products more accessible to a wider range of consumers. Moreover,

continuous innovation and economies of scale can drive down manufacturing costs, also making smart pianos more affordable and accessible to a wider range of consumers. This could potentially increase the appeal of smart pianos and contribute to their wider adoption in the market. Second, although the functions and features of smart pianos have been greatly improved, they still cannot completely replace traditional acoustic pianos, especially in terms of sound production and performance. Smart pianos still cannot compete with acoustic pianos in terms of sound quality, touch, and resonance. In addition, smart pianos face software and hardware upgrade and maintenance problems, which require continuous investment of time and money for improvement and maintenance. Compounded with this is the fact that the market for classical music is relatively small and not very profitable.

Even despite these issues, smart pianos seem likely to attract capital and talent. The economic policies of the Chinese government and the strong promotion of the smart industry by some investors should help, even as the industry faces competitive pressure. As Chinese parents' awareness of the value of piano education grows, so does the demand for quality piano education. With advances in artificial intelligence and virtual reality technology, piano education has tremendous potential for growth.

Chapter 6.

Conclusion

In China, the history of piano education is only about 100 years old. In fact, it wasn't until the 1990s that learning to play the piano began to be accepted by the general public. Progressing from a time when only a few people learned the piano, China has developed one of the largest populations of piano students in the world. From pre-school children to retirees, people of all ages are learning the piano. As a result, piano learning is slowly moving from the traditional elite class to the middle class, becoming an essential part of quality education.

Except for those training for a college piano performance major or a professional career, most students learn the piano as an extracurricular interest for which continuity is key. Rather than just playing a few famous songs, children should remain enthusiastic and motivated about learning the piano. The skills and experiences of learning piano will doubtless have an impact on these students' future lives. Therefore, it is important how the child solves the problems of playing the piano, how he or she correctly understands the importance of deliberate practice, and how practicing a piece impacts the student, especially on the psychological level.

The future model of education may generally be a hybrid one in which on-campus and online learning coexist and complement each other. Especially since the pandemic, online education has become increasingly accepted. Although music education has also come to incorporate online education forms such as live classes and recorded classes, such instruction is not yet fully mature in terms of content and learning effect. However, it seems certain that online piano instruction will become important in future. To successfully realize a hybrid approach to piano teaching, one must know what knowledge is suitable for online learning and what content must be learned in person. Online teaching must also be delineated according to the age and

experience level of the learner. Given the state of online piano teaching, these issues cannot yet be fully resolved on a large scale.

The future of college piano education can also be more interdisciplinary, not only in terms of developing musical comprehensive knowledge and sound musicianship, but also in terms of integrating musical education with other academic disciplines. Combining music education and psychology, for instance, has yielded the current discipline of music therapy; combining music and mathematics can yield something similar to Schoenberg's twelve-tone theory. As a result, education itself can become more interdisciplinary and receive more attention. Increased integration could lead to increased open-mindedness, which in turn can increase the diversity of the music industry. By embracing new technological advances, we can increase the efficiency of learning and the enjoyment of the learning process, thus attracting more people to piano education. This will not only provide more opportunities for musicians but also allow audiences to enjoy more performances.

The smart piano promises to make piano learning easier for the general public. This outlook reflects a hopeful view of the atmosphere of piano education in China. China's educational culture has a widespread reputation for tiger parents, who want their children to succeed in their studies and are willing to do whatever it takes. However, this intense focus can sometimes cause children to lose the joy of learning piano and turn it into a stressful and burdensome experience.

The advent of smart pianos offers a possibility to solve this problem, offering an easier, more enjoyable way to learn and providing personalized instruction based on the student's needs and interests. With smart piano apps, students can learn on their own at home, free from excessive family pressure and expectations. This way of learning allows students to feel more comfortable exploring music, stimulates their interest in learning and creativity, and allows them

to enjoy the learning process better. It may also change the educational outlook of tiger parents, who tend to focus only on utilitarian learning and achievement. One can reasonably expect the smart piano to help students overcome excessive peer pressure and rediscover the joy and fun of learning music. As a result, the emergence of smart pianos promises to expand the horizons of piano education.

Appendix A

Figure Muzio Clementi, *Sonatina in C Major, Op. 36, No. 1, First Movement, bars 1-23*

Sonatina I

Allegro

The musical score for the first movement of the Sonatina I by Muzio Clementi, Op. 36, No. 1, consists of 23 bars. It is written in C major and 3/4 time. The tempo is marked **Allegro**. The score is presented in six systems, each with a treble and bass clef staff. Fingerings are indicated by numbers 1-5 above notes. Dynamics include *f* (forte), *p* (piano), and *cresc.* (crescendo). The piece concludes with a repeat sign at the end of bar 23.

Bar 1: Treble clef, *f*. Fingerings: 2 4 2 1 1, 2 4 2 1 5, 4 3 2 1 2 3, 5 4, 2 4, 3 5 3 1 4 2.

Bar 7: Treble clef, *f*. Fingerings: 4 2 4 2 4 2 4 2, 1 4 5, 1 5 5 5, 1 1# 1# 1# 1# 1# 1# 1# 1#.

Bar 12: Treble clef. Fingerings: 1 2 3 5 4 3 2 1, 3 2 4 3 5 4 3 2, 4 3 2 1 5 4 3 2, 1, 5 4 2 1 5.

Bar 16: Treble clef, *p*. Fingerings: 2 4, 2 4 5, 4 2 3 1, 2 3, 2 3.

Bar 22: Treble clef, *p*. Fingerings: 3 4 5 3 5 4 3 2, 5 1, 2 4 2 1 1, 1 2 3 1 2.

Bar 28: Treble clef, *cresc.*, *f*. Fingerings: 2 1 2 4 4, 2 1 2 3 5, 3 1 1 1 1, 1 2 3 1 2, 1 2 3 1 2.

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