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## HOOK Student Guitars

### **Introduction:**

Hook Student Guitars attempt to reimagine the way that we teach, learn, and play music in public space. Developed in response to the defunding of arts in our public-school system, HOOK guitars have been designed to be more durable, more cost effective, and more easily storable than traditional wooden instruments. These guitars can be purchased by an organization, and then checked out by players via a corresponding guitar pick, a system that promotes communal learning and growth without posing a long-term cost to the institution.

### **Contextual Background:**

The 2001 No Child Left Behind Act deemed that all national funding to the U.S. Public School System be doled out relative to school's performance on standardized tests<sup>1</sup>. These tests encompass what is known as "Core" subjects in the school curriculum: Math, English, Science, and History. When a school performs poorly in these areas, and their funding diminishes, the institution will generally look outside of these areas to make cuts. The first subject to go in many Public K-12 Schools across the U.S. since 2001 has been Music Education<sup>2</sup>. Brightmoor, a suburb of Detroit, is a community that has seen a substantial amount of hardship since the economic collapse of the motor city in the early 2000's. Faced with an exorbitant crime rate and a lack of jobs and public services, education in Brightmoor has also begun to suffer greatly.

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<sup>1</sup> Abernathy, Scott. No Child Left Behind and the Public Schools. Ann Arbor, US: University of Michigan Press, 2008. ProQuest ebrary. Web. 21 April 2017.

<sup>2</sup> Major, M. L. "How They Decide: A Case Study Examining the Decision-Making Process for Keeping or Cutting Music in a K-12 Public School District." *Journal of Research in Music Education* 61, no. 1 (2013): 5-25. doi:10.1177/0022429412474313.

In 2012, when state funding cuts to Detroit public schools hit the 200 million dollar mark, a group of University of Michigan Students established Seven Mile Music<sup>3</sup>. Seven Mile is a student run and funded organization that provides cost free music lessons to young people at community centers around the Detroit area, including Brightmoor's Mission City, with the mission statement: "To provide youth in Detroit lasting opportunities to learn and enjoy music and the arts." It is important to note that while Detroit has been particularly harshly affected by a lack of education in the arts, this is a nation-wide problem that has received a nationwide response. Seven Mile Music is what many would qualify as a Creative Youth Development Program, or CYD for short. CYD's have seen a significant rise in numbers since the turn of the century, and have recently begun to be acknowledged on a national scale with the introduction of the Obama Administration's National Art and Humanities Youth Program Awards<sup>4</sup>. In the years to come these community programs will likely become more plentiful and more necessary with the Trump administrations proposed budget cut of 9 Billion dollars to the U.S. Department of Education in 2018<sup>5</sup>.

The guitar is currently the instrument of choice amongst the community at Mission City, as well as at many other CYD's around the country. After a research trip to Brightmoor interacting with the students and the community, I noticed an obvious difference between the level of community involvement surrounding the guitar and the community involvement surrounding other instruments (Violin, Cello, Piano, Saxophone, French horn.) The guitar not only pulled in the most students, it also pulled in their parents, and blues players from the surrounding communities to teach workshops. This level of unrewarded involvement on the part of any community warrants a deeper investigation into the

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<sup>3</sup> Vimeo. April 16, 2017. Accessed April 21, 2017. <https://vimeo.com/141237202>.

<sup>4</sup> Montgomery, Denise. "The Rise of Creative Youth Development." *Arts Education Policy Review* 118, no. 1 (2016): 1-18. doi:10.1080/10632913.2015.1064051.

<sup>5</sup> White, Gillian B. "The Data Are Damning: How Race Influences School Funding." *The Atlantic*. September 30, 2015. Accessed April 21, 2017. <https://www.theatlantic.com/business/archive/2015/09/public-school-funding-and-the-role-of-race/408085/>.

history and design of the guitar, to uncover why it is so attractive to aspiring musicians in impoverished communities, how it could be made into a more effective tool to reinvigorate the arts in these communities and ultimately help to return music to our education system.

### **History of the American Flat-Top Guitar**

In 1833, Charles Friedrich Martin, arrived in New York City. A German immigrant, Martin left his homeland and established his first storefront in New York City as an instrument maker, repairman, and reseller. Music being an important part of life at sea, sailors from around the world would bring their instruments to Martin's shop for repair, giving him a wide variety of inspiration to pull from. Most notably for our purposes was the Spanish guitar. At this point in history guitar-like instruments had made their rounds throughout Europe, developing a distinct style in each country. The Spanish guitar, an instrument which most northern European makers wouldn't go near due to intense religious, political, and trade competition with Spain, began to migrate to New York through Latin America<sup>6</sup>.

While Anglo immigrants to the New World were able to integrate themselves as Americans, the Spanish were forever branded as European, due to inherited northern European biases. The home of the Spanish guitar, in the New World, was the humble bars and taverns of the outcast Spanish. Through traditional Spanish culture the instrument romanticized poor but glamorous figures from Spanish society. Reports of the Spanish guitar poured into the colonies from outer territories. Mexico, and the islands off its coast, adopted it very quickly. These Reports exemplified the guitar as a "folk" instrument. An instrument of the people, for farm hands and laborers that worked all day, and then cut loose in the night, typically to the Spanish fandango. Through adopting physical aspects of the Spanish guitar and

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<sup>6</sup> Shaw, Robert, and Peter Szego. *Inventing the American Guitar: The Pre-Civil War Innovations of C.F. Martin and His Contemporaries*. Milwaukee, WI: Hal Leonard Books, 2013.

subsequently its mentality, Martin created an American instrument that was utilitarian in both a spiritual and physical sense.



Left, Traditional Viennese guitar built by martin c.1834 Source: [www.cbsnews.com](http://www.cbsnews.com). Right, 1864 Martin Parlor Guitar Source: [cbsnews.com](http://cbsnews.com).

The utility inherent in Martin's design, combined with the moral compass of early folk music, made it the instrument of choice for the early blues musician. The origins of the blues are relatively poorly documented due to the transitory nature and oppression of its performers. The moment that is anecdotally thought of as the birth of the blues is recorded by prolific black composer W.C. Handy:

One night in 1903, while napping on a bench at the train depot in the Mississippi Delta hamlet of Tutwiler, Handy awoke to the sound of strange music. Looking around the platform, he saw a man playing a guitar and singing. The sad-looking guitarist used a knife to slide across the instrument's strings and repeated his lyrics several times in each verse. Though Handy did not know it at the time, he was witnessing two of the essential features of Delta blues music: the slide guitar technique and the repetitive lyrical structure, derived from old field hollers.<sup>7</sup>

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<sup>7</sup> Lawson, A. R. "The First Century of Blues: One Hundred Years of Hearing and Interpreting the Music and the Musicians." *Southern Cultures* 13, no. 3 (2013): 39-61.

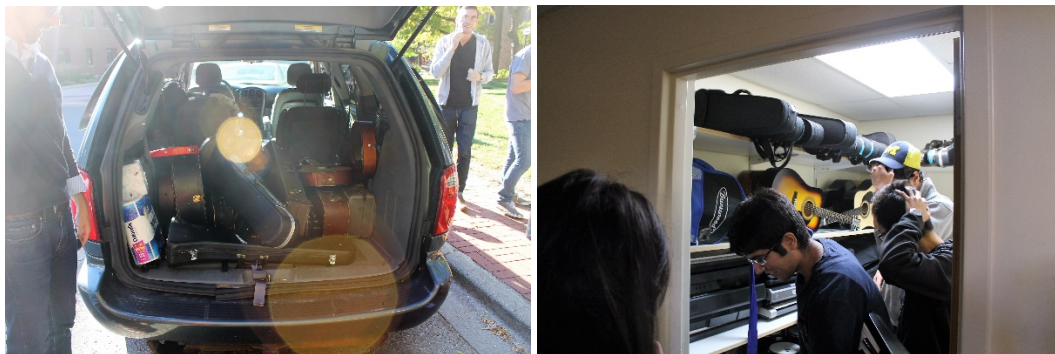
Here we see the guitar as having a significant historical connection to both black and Hispanic cultures in the U.S. It is this realization of the guitar as a culturally rich instrument, outside of the context of popular music, that offers an explanation for the level of experienced community involvement. Recent research from Data Scientist David Mosenskis shows that “At any given poverty level, districts that have a higher proportion of white students get substantially higher funding than districts that have more minority students.<sup>8</sup>” Minority Communities, regardless of wealth, make up the majority of communities effected by budget cuts, and subsequently constitute the main audience of CYD programs. It is not a far stretch from here to assume that a Minority administration would be more likely to fight to hold on to a music curriculum that featured the guitar, advocating for an insertion of the guitar into a public-school curriculum.

### **Defining The Problem**

When considering the obstacles standing in the path of Community Youth Development Programs, like the one at Brightmoor’s Mission City, the greatest is the architecture of the space provided. The post-industrial spaces that many of these programs find themselves in, are simply not designed to store large amounts of instruments, or to acoustically accommodate many people playing instruments at once. Wooden stringed instruments are designed as singular objects, they do not work well in groups. Currently instruments are being stacked in boiler room, closets and rental car trunks. Storage in these poor conditions causes problems with warping wood, broken strings and detuning.

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<sup>8</sup> White, Gillian B. "The Data Are Damning: How Race Influences School Funding." The Atlantic. September 30, 2015. Accessed April 21, 2017. <https://www.theatlantic.com/business/archive/2015/09/public-school-funding-and-the-role-of-race/408085/>.



The battle to keep instruments in a playable state at Mission City is constant and costly to all parties involved. In the current system, students only have access to instruments during scheduled lesson times, they do not have repeated access to the same instrument, nor are they responsible for the instrument's care. As a result, the likelihood of a student developing a relationship with an instrument is relatively low. It is widely accepted in musicology that the connection between a player and their instrument is what determines whether a musician will be able to use music as a coping mechanism. Players that log long hours of practice and care on the same instrument are much less likely to experience anxiety and much more likely to turn to music to deal with outside stress<sup>9</sup>. This is the inherent problem, the need for a community instrument directly conflicts with the need for an individualized experience.

### **Market Research & Competition**

In the 1950's, with guitars beginning to be industrially produced, designers were tasked with the job of getting them into the hands of as many people as possible. To accomplish this, the guitar began to accentuate accessibility through design. Department stores like Sears and Roebuck and Montgomery

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<sup>9</sup> Simoens, Veerle L., and Mari Tervaniemi. "Musician–instrument Relationship as a Candidate Index for Professional Well-being in Musicians." *Psychology of Aesthetics, Creativity, and the Arts* 7, no. 2 (2013): 171-80. doi:10.1037/a0030164.

Ward adapted their high-fi stereo lines into guitars, essentially turning the instrument into a toy that could be sold alongside BB-Guns and bicycles in mail order magazines.

One of our finest Amplifiers—60-watt music power, echoing reverb/chorus and pulsating tremolo produce bold, exciting sounds... separate power! **\$159.95**

Now at Sears  
Silvertone  
Electric  
Guitar  
**\$109.95**

True solid body electric dual pickup Guitar includes all-steel speaker amplifier cord... **\$109.95**

Without fine-tuning... **\$84.95**

There's excitement built into this 33½" hollow-body "honey chamber" Electric Guitar... **\$84.95**

The neck of a guitar is very important... our adjustable dual-reinforcing rod eliminates warpage... **\$62.95**

that might occur from string pull or climatic changes... **\$62.95**

Because the fingerboard stays true and responsive you can set the strings as low as you like with the adjustable bridge for the type of finger action you want... **\$62.95**

solid body Electric Guitar **\$62.95**



Left, Sears and Roebuck Silvertone Guitar Ad c.1960 Source: [www.searsarchives.com](http://www.searsarchives.com). Right, 1965 Airline JB Hutto source: [www.guitarplayer.com](http://www.guitarplayer.com)

They frequently boast low prices, generally between forty and sixty dollars including equipment. The instruments were sold with simple equipment to alleviate the struggle of purchasing accessories. The design principles of these mid-century oddballs still live today in many low-cost student instruments, as well as many practice instruments. The category of student instruments, outside of classical music, mainly consist of tambourines, drums, and recorders. These instruments have become popular because they are engaging to pick up and play, because they are obvious candidates for mass production, and because they are easily stored. Instruments of this size and shape naturally work well in groups, they are lightweight, durable, and once made from plastic, extremely cheap, occasionally also becoming stackable or nestable. At this point these instruments are really more similarly related to a set of cheap plastic stacking chairs than they are to their wooden ancestors.



Left, Remo Sound Shape Circle Pack Source: [www.music-produktiv.com](http://www.music-produktiv.com). Right, Gresswell ST Chairs Source: [www.Gresswell.co.uk](http://www.Gresswell.co.uk).

Recently the concept of student instruments has evolved into what are known as practice instruments. Practice instruments have developed based off of the idea that the average person likely spends more time alone with their instrument practicing than they do playing on stage. These instruments exist generally in two categories, guitar-like electronic instruments, and travel instruments for experienced players. Currently, the two most popular examples of these would be the Yamaha SILENT Guitar, and the Artiphon Instrument 1. In design language and intended use these instruments are polar opposites. The Artiphon (pictured Left) priced at \$399.00 is largely derived from synth guitars, originally built by Cassio, that began popping up on the market in the 1980's. Since then this type of fully electronic instrument has reappeared in all different shapes and sizes, each time failing to truly function as a replacement for more standard electric guitars. These instruments generally present themselves, through design language as an expensive toy. They do so by using primarily plastic parts, light color schemes, friendly lines, and an overload of dials, switches and features. These instruments come and go as a fad, failing to catch on with playing musicians, and also failing to create a full enough experience that a beginner could use the instrument to progress to something larger. The Artiphone, like its predecessors, lacks strings. This is demonized by players who can't get past the lack of tactile response and typically disappoints beginners who inevitably realize that they have not developed the hand strength to play a stringed instrument. This common thread, which is typically glorified in marketing



campaigns as adding functionality and user friendliness, likely stems from the inability of designers to engineer cheap materials to withstand the stress of taught guitar strings. The Yamaha Silent guitar (pictured Right), with a starting price of \$1,015.00 and much more aggressive styling, is aimed at a more experienced market. This guitar attempts to take the concept of the synth instrument and package it in a way that an experienced player could get behind, its dark color, high price range and sharp curves intimidate beginners from purchasing the instrument.

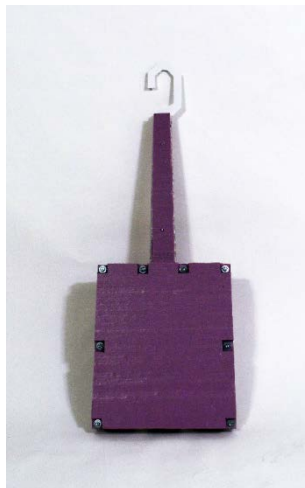


Left, Artiphon Instrument 1 Source: [store.moma.org](https://store.moma.org). Right, Yamaha Silent Guitar Source: [www.amazon.com](https://www.amazon.com)

## Methodology

After analyzing my collected notes, photographs, and interviews from Brightmoor's Mission City, I made the, seemingly contradictory, decision to create and introduce a new product, as opposed to a system. While the budget at most CYD programs is incredibly tight, I felt that a purpose-built instrument would save more money in the long run, attract more students to the program, and open up secondary

markets. Additionally, because the guitar is not an instrument typically associated with music education, guitars can not be taken directly from the school district (which is typically what happens with other instruments). I began ideation around three realized pain points. These were: transportation of instruments, storage of instruments, and volume within the space. Using thumbnail sketches, I was able to explore possible functions to add to the guitar, while using quick 3D foam prototypes to explore the basic ergonomics of the instrument. After accounting for the results of my ideation I set out a list of physical parameters that I wanted my final design to meet. These were: The product must not be susceptible to damage by weather, cost under \$100.00, suit a variety of sizes, give user control of sound (direction/volume), store itself conveniently in closets and cars without a case, and weigh less than 8lbs. My first rough prototype (pictured below) combines the results of my ideation and ergonomics studies.



This prototype features a hook to store multiple instruments from a coat rack, already available in most spaces, and easily purchasable if not. It is constructed out of four plastic panels, imagined here in purple insulation foam, that bolt to an aluminum skeleton, pictured here in white foam core. The choice to begin working with these materials was the result of research into the acoustic properties of materials that are durable, commonly available, and easily used in manufacturing processes.

In constructing this prototype, I also decided to make the guitar electric. Solid Body Electric guitars are more durable than Wooden acoustics, they can also be made cheaper, lighter, and the tone of an electric is less dependent on the material it is made from. The only con of designing an electric guitar was that it required some sort of amplification system. I paired this first prototype with a flat amplifier that could rest on the back of the guitar in storage, and be carried in a backpack. Because the speaker is flat, it has the ability to lay under the seat of the player during use, projecting sound up at the user and not out into the room.



Moving on to prototypes 2 and 3 I began working with my chosen materials and refining the design of the instrument aesthetically. In response to critique, the amplification system was moved

inside of the instrument, adding bulk, but eliminating excess parts. I began to ideate on a locking mechanism for the headstock, to dissuade theft, and subsequently also began developing a guitar pick that would also function as a key for students to use to unlock the instrument. With the 3<sup>rd</sup> prototype I settled on a locking mechanism that allowed for institutions to optionally add their own lock to the instruments. If a lock was desired then the pick could be used to house a combination to that lock, if not then the pick would simply function as an object connecting the student to their guitar, creating a perceived sense of ownership and promoting a closer bond between the player and their instrument.



With all of the technical challenges ironed out in prototype 3 I was able to further refine the instrument's aesthetic design in the final prototype. Looking to combine the attractive look of the early 50's student guitar, with the anyone can do it attitude of the Artiphone, and the real playability of the Yamaha, I began looking mainly to popular electronics and modern automotive design for styling cues, and to the scale and measurement of popular players instruments for final dimensions. The final product, named HOOK Student Guitar comes in three different colors: rouge, orange, and teal. It is a full-scale guitar, with an active string length 22.5 inches, and a, smaller than average, total length of 35 inches. This is due to an ergonomically designed body, which suits players of all ages while maintaining a balanced feel. It utilizes an inbuilt 9-watt amplifier and an 8-ohm audio exciter to project sound back at the player. The addition of the audio exciter, in place of a traditional speaker, allows the back panel of the instrument itself to produce the sound. When a player strikes the string he/she receives an immediate response that they can feel coming right from the instrument, similar to a fully acoustic guitar. Each guitar has a locking headstock that allows it to hang for storage. Additionally, the instruments are fitted with two cut out nesting points that allow them to hang stably from a rack or stack on top of each other vertically, without any risk of damage. This final design is constructed of three individual pieces of 1/8" metal stamped 6061 aluminum and nine injection molded High density polyethylene plastic body pieces.





Production costs of the final instrument would be ~\$20.55 per unit, with a production run of 100,000 units. Instruments could be sold with a sizeable markup of 46% at ~\$30.00 per unit with price decreasing per number of units ordered. To put that in perspective, a program like the one at Mission City would be able to recoup an investment in 10 HOOK Guitars in about a month, from the money they would save on replacing strings alone. The instruments would be realistically purchasable by the

primary market of CYD programs, and also accommodating to secondary markets of high school music programs, and public workspaces like office buildings, rec centers, etc. As a full sized, and truly playable, instrument for under \$50.00, the guitar would be relatively competition free. Comparable student models (with an included amplifier) begin at \$100.00 dollars for off brand instruments, and \$175.00 for a trusted Name brand instrument.

### **Conclusion**

Overall, Hook Guitars present an interesting argument for how the sphere of public service design can be broadened to better effect the lives of people in need of a good time. When it comes to what we view as absolutely essential, the arts are too commonly overlooked, and through this project I have shown that design is capable of changing that equation. With the final prototype, I was able to accomplish most of the physical goals that I set out for myself from the start of the project. The guitar is lightweight, cheap, durable, well organized and, in my opinion, attractive, but I still feel that I need to do more user testing before I can consider it truly successful. Over the course of the year, I was able to improve on a myriad of skills that helped me get my design to this point, but somewhere along the line, all of that technical work began to cut into the time that I was able to spend interacting with the community and gauging their responses to the product. In the future, I want to be more conscious of how I allocate my time between the studio and the real world.

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