Feasibility Study for Makerspace Venture Options in the CCAC Annex

A report by students in the Affordable Design and Entrepreneurship Program (ADE) at Babson and Olin Colleges

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June 22, 2015

Executive Summary

Shanika is a high school junior. She is not looking forward to graduation, unenthused about the options she faces. One day in her neighborhood, Shanika notices many of her neighbors gathered around a truck. The truck is called a mobile makerspace, equipped with all kinds of fabrication tools and run by knowledgeable makers. She sees her neighbors making everything from t-shirt art to welded sculpture furniture and decides to check it out. After getting more familiar with the mobile space, she decides to visit the main makerspace in the Cultural Arts Center downtown and enjoys the positive, uplifting vibe. After a few months, Shanika has completed a number of projects and developed friendships with people from all over Coahoma County. She also has been able to learn from a variety of local business owners, community organizers, and leaders. For example, she was able to meet a restaurant owner who told her all about how he came to open a business in Clarksdale. Feeling that she can accomplish anything, Shanika now sees the vast possibilities right in her hometown, and is proud to be from Clarksdale.

The idea of a makerspace emerged from interactions with Coahoma County youth and community organizers. **All communicated a need for hands on engagement for youth and we believe that there could be many Shanika's who find direction and opportunity in Clarksdale through a makerspace venture.** In this Feasibility Study, we will explore options around developing a makerspace in the annex of the Crossroads Cultural Arts Center (CCAC). With a wide range of implementation strategies for consideration, this space could provide programming around digital and analog making such as woodworking, metalworking, 3D printing, and laser cutting. Through this programming, the makerspace will provide hands-on engagement for young adults, with the goal of fostering self-empowerment through the development of self-efficacy and relationships across socioeconomic boundaries.

The space being considered offers a wide range of implementation strategies, with different focuses, outcomes, and funding strategies. The idea for a makerspace originated from interactions from Clarksdale youth and community organizers, and it is imperative that it be developed and implemented in partnership with Clarksdale youth and community organizers as well.

Makerspace Mission and Objectives

Via programming around digital and analog making, these makerspace options will provide hands-on engagement for young adults which will foster self-empowerment through the development of self-efficacy and relationships across socioeconomic boundaries.

Hands-on learning experiences are engaging and produce immediate and easily appreciable measures of success. The experience of creating something useful can translate into a demonstration of one's ability to create and bring change in other endeavors.

The key factors that differentiate our venture from similar youth programs in the area are the emphasis on honing 21st century skills and the opportunity and avenue to network with residents of Clarksdale that our target group would likely never make connections with otherwise. These key differentiations, as well as the following objectives, are central to the implementation and mission of the makerspace.

1. 21st century making skills
2. Exposure to new ideas
3. Community skill-sharing
4. Intergenerational learning
5. Bridging communities
6. Community led program

21st Century Making Skills

The 21st century skills, which include collaboration, communication, analytical thinking, problem solving, information finding and evaluation, and creation/innovation, are a set of broadly applicable skills which transcend the topicality of many educational systems. Practical experience gained by fabrication and expanding one's network in this space would lead to the development of these skills which are instrumental in any job or new venture.

Exposure to New Ideas:

We heard from the young people we met with in the focus groups that there was little exposure to new ideas and cultures in Clarksdale. The rural nature of the town tends to lead to and reinforce isolation from other cultures and the rapidly evolving tech world. This could be remedied through awareness and education in the makerspace and its programs.

Community Skill-Sharing:

There are many people around Clarksdale who already engage in creative activity, and the makerspace should recognize and celebrate that. By providing an environment where people

can share existing skills, new connections can be fostered and the visibility of local successes can be increased.

Intergenerational Learning:

We also see the potential for members of different generations teach and learn from one another. One could imagine people who grew up in the midst of the civil rights movement working alongside high schoolers, this could benefit the transfer of community knowledge and stories as well as make all the generations feel more involved and connected.

Bridging Communities:

We've heard and seen that in many ways Clarksdale is still a very divided community. With that in mind, accessibility focusing on traditionally marginalized groups in the town will need to be addressed. Accessibility will mean not only transportation to and from the space, but also each person's sense of safety and comfort in being in the space. The latter will require a significant amount of outreach and public relations work, actively reaching out to these traditionally marginalized communities and valuing their voices.

Community-Led Program:

One of the important aspects we heard about a potential space and program is that the program be led by those in the community who are participating. This community ownership over the project ensures that the community has buy-in, trusts the organizational system, and maintains agency over the space and program. The only way to ensure that the space fits the needs and desires of the community is by making sure that leaders are representative of the community.

User Representations

The following section details the different kind of people we envision interacting with this space. These include young people, community members, community developers, local artisans, and local entrepreneurs. The interactions, from the most personally focused (1) to the most organizationally focused (5) are as follows:

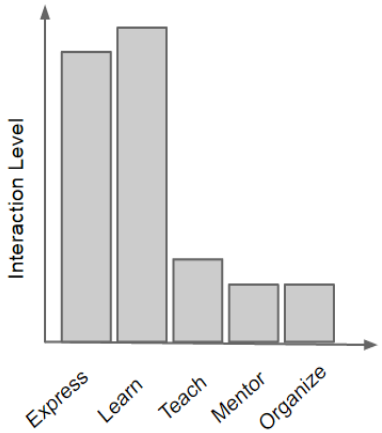
1. Expressing
2. Learning
3. Teaching
4. Mentoring
5. Organizing

We see three groups of key users: young people, adult community members, and community organizers. We've developed a visual representation of their interactions (fig. 1-6), which helped us develop interaction narratives in the next section detailing our makerspace options. These visual representations are not based on quantitative data, but rather from overarching themes we've noticed.

Young People: Shanika the Sponge & Thomas the Teacher

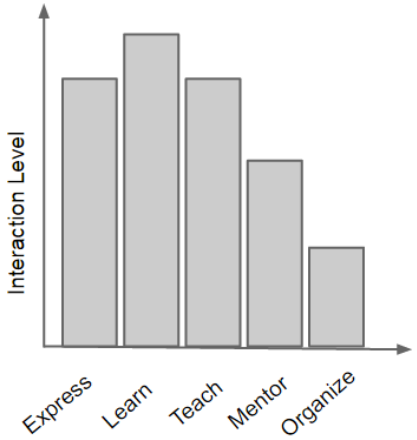
<u>Shanika the Sponge:</u>

Shanika is a Junior at CCHS who is organized and doesn't like being idle. She sees that her best options are outside of Clarksdale. She might use a makerspace most for learning new hands-on skills, but would likely come out of such a space for an appreciation for the possibilities in the local community, both in terms of seeing what others are doing and for seeing what she could make happen locally.



Thomas the Teacher:

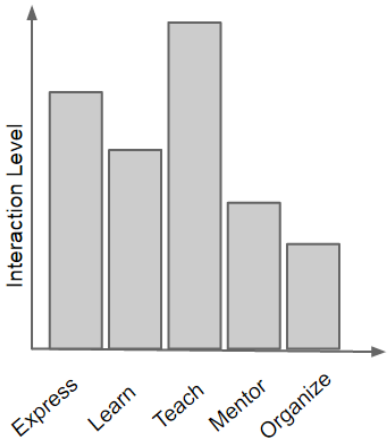
Thomas is a musician in the 11th grade at the Ombudsman school. He never felt comfortable learning in large group settings and didn't get much from traditional classroom settings. In a makerspace he could find a smaller community with more individual mentorship and a place where he can learn the program and tools and start to teach others what he has learned.



Adult Community Members: Henry the Passionate Hobbyist & Alisha the Artisan

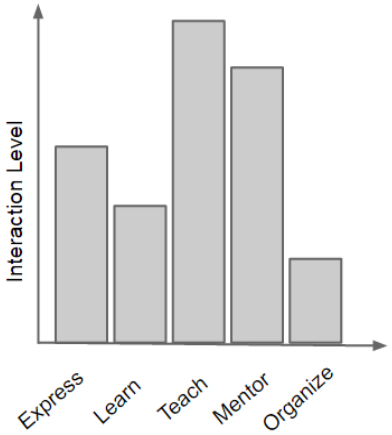
Henry the Passionate Hobbyist:

Henry is a father who works at Walmart. He really loves woodworking, and already spends time teaching his two kids to do projects from toys to practical fixes around the house. Henry would appreciate the makerspace both for the opportunity to share his passion with more youth in the community but also for the opportunity to develop his own skills with new equipment and a supportive community.



Alisha the Artisan:

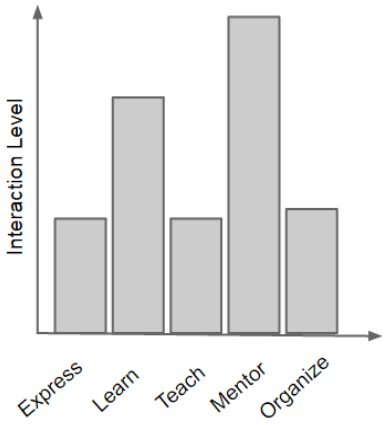
Alisha is a local entrepreneur. She studied graphic design at CCC and now runs a small business that designs and makes logos, t-shirts, signs and websites for a variety of people. She loves sharing her story and would appreciate the makerspace as a way to encourage, mentor, and support up-and-coming entrepreneurs. She values giving back to the community that supported her, and would like to see a growing vibrant community in Clarksdale.



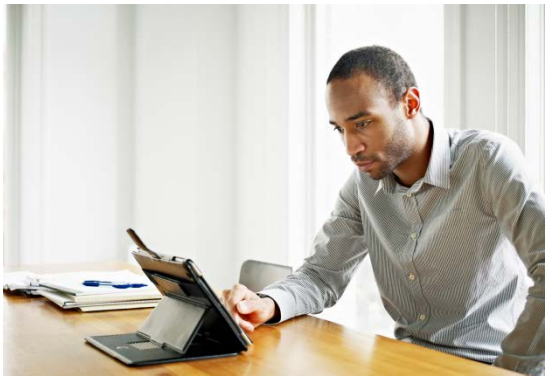
Community Organizers: Margaret the Mentor & Oscar the Organizer

Margaret the Mentor:

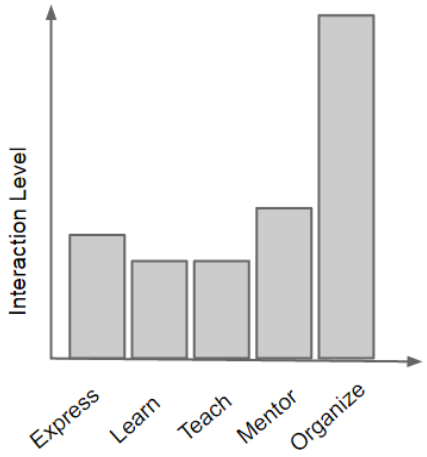
Margaret is a retired teacher who taught for many years before starting a youth development organization nearby. She cares deeply about people and values one-on-one relationships with mutual trust and guidance. She would come to the space mostly to connect with and guide local youth, but would also enjoy engaging in the creative making that goes on in the space. She appreciates having the opportunity to give back without having to run the show herself.



Oscar the Organizer:



Oscar thinks big picture when he thinks of community development work. His years of academic experience, both learning and running programs at Ole Miss and CCC leave him very well connected. He would love to help keep the makerspace running and encourage entrepreneurship, connecting both the program and participants to sources of funding and mentorship. He would also get really excited to get his hands busy with some of the fabrication in the space.



These customer segments begin capture the wide variety of community members who could all engage in the makerspace. They would all bring something to the community, and they would all get something out of interactions in the space. An important point to note is that any one person or segment, though they may focus mostly on one of the ELTMO activities, will likely engage in many of them.

Makerspace Options

Existing Makerspaces

The term “makerspace” could mean a wide variety of things, as makerspaces all over the country look radically different from one another. Some focus on turning graphic design into physical objects and building businesses around those, some are simply collections of tools and space that people come together and use. Some have a strong programmatic component and some are more focused on just the access to resources.

Liberating Ourselves Locally: Oakland Makerspace

oaklandmakerspace.wordpress.com
Oakland, CA
Active since 2012

Mission:

“Founded and led by people of color, LOL!—Liberating Ourselves Locally—is an Oakland Maker Space and Hacker Space that works for a future where members of our community can be involved in all aspects of creating things that sustain us, such as food, clothing, energy, technology, shelter, and art”

Recent Programs:

Craft Night, Hack Night, coding workshops, network security teach-in, candle making, cooking workshops

Computer Clubhouse Network

computerclubhouse.org
International Community—100 Clubhouses, 20 countries
Active since 1993

Mission:

"The Computer Clubhouse mission is to create a safe out-of school learning environment where young people from underserved communities work with adult mentors to explore their own ideas, develop new skills, and build confidence in themselves through the use of technology"

Recent Programs:

Clubhouse-to-College/Career, Teen Summit, Adobe Youth Voices, Alumni Network

STE(A)M Truck

community-guilds.org/steamtruck
Atlanta, GA
Active since 2013

Mission:

"STE(A)M Truck™ is a mobile innovation lab that inspires youth to learn Science, Technology, Engineering, Arts, and Math by bringing tools, equipment and experts directly to students"

Recent Programs:

Governor's Office of Student Affairs' Georgia Innovation Conference, Atlanta Science Festival, Elementary and Middle School Visits, and Boys & Girls Club Visits

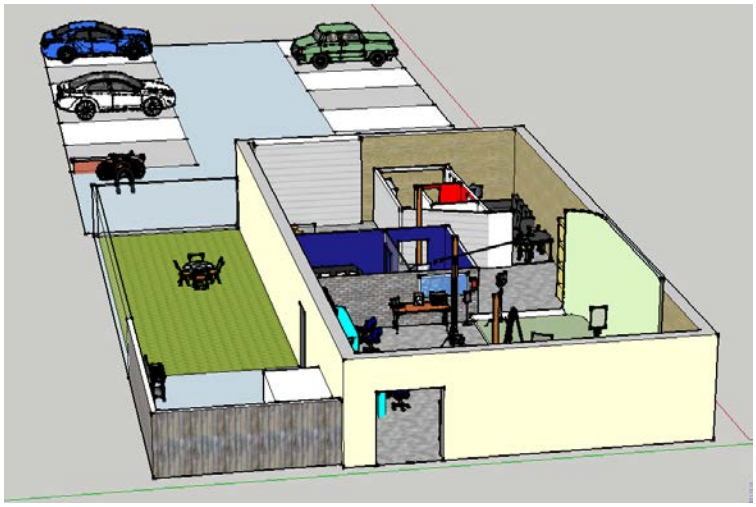
Suggested Makerspace Modules

Below you'll find the details on four modules that we thought would fit with Clarksdale and the needs and vision outlined above. These modules could be integrated in a number of combinations, with either some or all of the modules implemented.

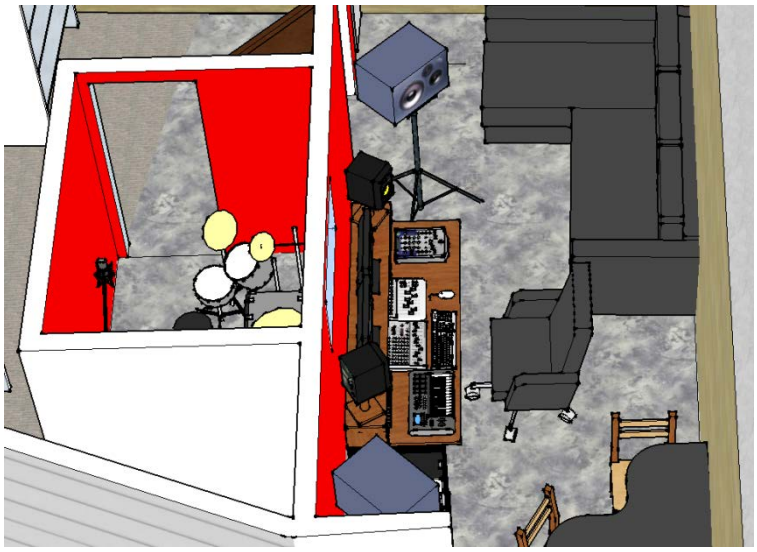
1. Design Studio
2. Fabrication Space
3. Entrepreneurship Lab
4. Mobile Lab

Below is a brief description of each module, the activities that could be developed, the availability of instructors, and an interaction story with representative users from the previous section. There is also a high level overview of the different financing implications for each of these modules.

Design Studio



The computer design studio is part of the space that is equipped with laptop computers, software and other physical tools, to support creative projects.



The design studio option empowers young adults with cutting edge technology to express themselves and to gain valuable skills. More than a computer lab, the value in this concept is combining the power of computers with other tools such as 3D printers, electronics, video and music recording equipment, and more.

Activities:

- Software Design
- Graphic Design
- Music Production
- Film & Photography
- Digital Fabrication

- Electronics/Robotics

Availability of Instructors:

We know there are teachers for activities like graphic design, music production, and photo/video production. We have yet to confirm that there are teachers available for activities like software programming and electronics.

Interaction Story:

Thomas tends to keep to himself and work alone most of the time. Because of this, he has found himself spending a lot of time on the computers at his school and in the library. He is a natural with all of the programs he uses. He wants to learn more, but is limited by the software on the computers and the hours they are available to him.

In this design studio, Thomas has access to powerful computers and a team of staff that can help him acquire most any program he requests. Here, he further develops his skills and even finds himself helping his peers with their own projects. The teachers see this and ask if he would like to join the teaching team. Through slowly increasing his responsibilities and formality of his lessons, he gains confidence, improves his interpersonal and leadership skills, and gets compensated for his work.

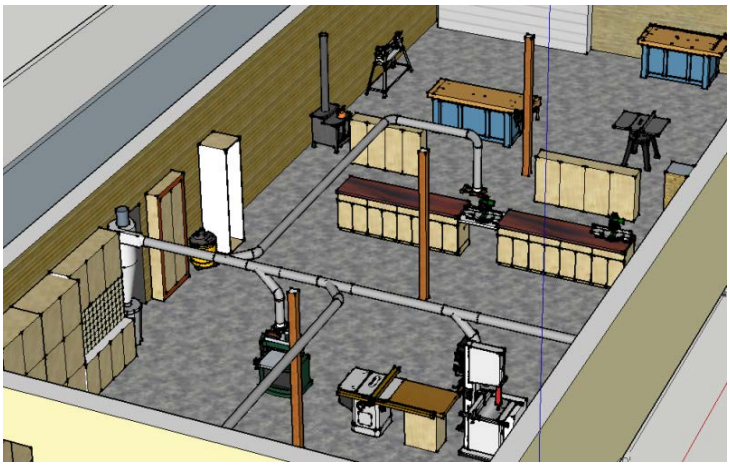
Financing Implications:

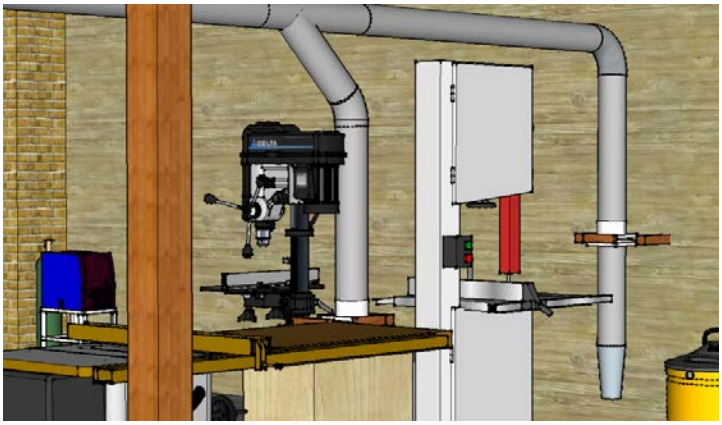
The largest cost capital costs would be in laptops, photography equipment, and software. With this technology rapidly evolving, these products face rapid depreciation and need to be replaced every few years to keep pace with the industry. One strategy to ameliorate the effects depreciation and rapid cannibalization is to lease rather than buy these products.

Fabrication Space:

A machine shop equipped with both digital and analog machines, like 3D printers, laser cutters, as well as band saws, lathes, mills etc.

In focusing on skills that are traditionally perceived to be masculine, it is important that young women and girls be particularly encouraged to engage with this space.





<u>Activities:</u>

- Product Creation
- Fabrication Workshops
- Sculpture Workshops

<u>Availability of Instructors:</u>

Based on our discussions in the community we think there are plenty of people with these sorts of fabrication skills.

<u>Interaction Story:</u>

Henry learned woodworking from his grandfather as a child. He always loved the feeling of building something with his own two hands, and takes great pride in sharing his knowledge with his children. However, with the cost of machines and his long hours at Walmart, his woodworking is largely limited to small repairs around the house. Upon hearing about the new makerspace downtown, his curiosity is piqued and he ventures in to see all the powerful tools he always dreamed of owning. As he starts working on a porch swing for his house, young people come up to him asking for help and advice on their own projects. Makerspace organizers take notice and ask him to teach workshops. In his first workshop series, he leads local young people to build another porch swing to hang with pride in front of the CCAC. Henry gets paid a reasonable hourly fee for his time, but his greatest reward is seeing the porch swing becoming a space for community gathering.

Financing Implications:

Both analog and digital fabrication equipment are expensive; however, analog fabrication tools can likely be purchased with a grant or at a discount from the manufacturers, and will not have to be updated as replaced nearly as often as digital fabrication equipment. With digital fabrication, as with the design studio equipment, a leasing agreement can help with rapid depreciation and replacement. Some of these companies are open to donating through grants or discounting equipment, for example, Autodesk.

Entrepreneurship Lab

Description:

The entrepreneurship lab is a place that fosters innovation and creativity. In order to develop entrepreneurs and entrepreneurial communities, a strong support network is critical. The space would be equipped with whiteboards, mentors, and would function best alongside the design studio module.

We believe that entrepreneurship can be built into each of the makerspace options we have presented. The weakness of emphasizing entrepreneurship is that it limits the number of people the space can directly serve. Helping someone start a business requires deep interactions with a small number of people. For this reason, we believe rather than entrepreneurship being the explicit focus of the space it should complement whatever skills are being taught.

Activities:

- Product Design
- Marketing
- Sales
- Operations

Availability of Instructors:

We've seen that local business owners and entrepreneurs are engaging with Clarksdale afterschool programs such as Spring Initiative and Griot Arts to mentor young people and speak about their experiences. With that in mind, we are confident that local business owners would engage with a makerspace in downtown Clarksdale.

Interaction Story:

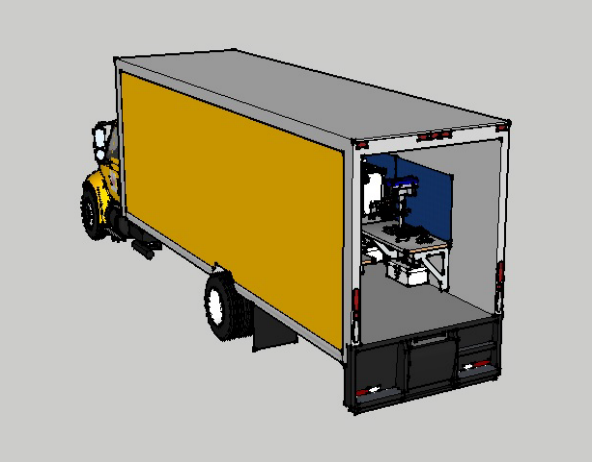
Alisha is a graphic designer and entrepreneur. Designing websites, logos, and promotional products for companies leaves her with flexible hours, and a

desire to share her knowledge and experience with young people. She often visits her alma mater, CCC, where she is connected with the makerspace downtown. Upon hearing her qualifications, organizers jump at the opportunity to ask Alisha to lead a workshop series on graphic design and operations. After a few weeks, she starts to get to know some of the young people, and even hires two of them on as interns to help her with inventory management and customer service. With the interns' help, she is able to expand her business, as well as the scope of her workshop series to become regular programming at the makerspace. She even learns how to use the 3D printer and laser cutter to make some of her product designs a reality!

Financing Implications:

The Entrepreneurship Lab would probably work best alongside the Design Studio module, such that participant can capitalize on the products that they design and build. Additional costs to consider here are furniture, presentation equipment (projectors, screens), and ideation materials (whiteboards, butcher paper, sticky notes, markers).

Mobile Lab



Like the STE(A)M Truck in Atlanta, GA, a mobile laboratory could be used to teach STEAM skills by bringing tools, equipment, and experts directly to people. The mobile makerspace would be a medium sized van equipped with an array of tools and supplies that aims to expose people to a wide variety of hands on activities.

With its mobility and versatility, the mobile lab will address three core competencies, which would add significant value and extend the reach and scale of the downtown makerspace.

1. Accessibility—For many young people in Coahoma County, downtown Clarksdale is not a welcoming place. This mobile space engages young people where they are and invites them back to the downtown space. The truck could engage not only Clarksdale youth, but also youth in more remote locations in Coahoma County, such as nearby Jonestown and Friar's Point.
2. Awareness—Driving the truck around and engaging the community in outdoor venues will provide visibility to the initiative. The reach and scale of the downtown space can be greatly expanded using this module.
3. Support to Existing Programs—By virtue of being a self-contained truck, the space can be quickly packed up and moved from place to place. For example, the truck could visit Real Faith afterschool programs, the library, the expo center, CCC, Clarksdale High, etc.

We see some potential limitations with the capacity of the truck. Due to its size, the mobile makerspace can handle much fewer people than a brick and mortar location, and also limits options for storage. With that in mind, we recommend that the mobile space exist in tandem with a brick and mortar location downtown.

Moving forward the board could consider creating a mobile makerspace before creating a full makerspace in the backspace. Not only does the mobile space require fewer funds, but it also allows programming to begin and impact to be made without extensive construction and remodeling of the space. Further, the mobile space can be used to gauge interest in and feasibility of teaching different skills and running different activities at a larger scale. As stated previously, with the limitations of the mobile space, we recommend that it exist in tandem with the downtown makerspace.

Activities:

- Product Creation
- Fabrication Workshops
- Sculpture Workshops

Interaction Story:

As a high school teacher, Margaret really found the most rewarding work to be one on one time with students after class. Students would come to Margaret in moments of emotional crisis, and over the years she was able to guide young people through some of their toughest decisions. Many of her former students live in her neighborhood and she is close with many of their families. One day, Margaret sees her neighbors gathered around a truck down the block. Curious, she approaches and sees her former students in the middle of a metal sculpture workshop. When they see her, the students are so excited to show her what they're making that the whirring and grinding of machines is brought to a halt. The organizers notice that Margaret is well liked among the young people, and once they get back to work, ask her to be a part of their mentorship program. Margaret loves the structured mentorship environment, and to her own surprise, falls in love with metalworking in the makerspace!

Financing Implications:

In addition to the depreciation of the fabrication equipment, maintenance and depreciation of the truck itself needs to be taken into consideration. The variable activity based costs of fuel, maintenance, and depreciation should motivate its organizers to maximize the value of its activities. The truck would need dedicated staff to design and run programming in addition to overseeing its maintenance.

Conclusion

We think that Clarksdale could greatly benefit from the addition of a makerspace in the annex of the upcoming Crossroads Cultural Arts Center. A space to celebrate learning, making, and doing can effectively achieve the objectives of developing 21st century making skills, ensuring a community led program, enabling community skill-sharing, enabling intergenerational learning, bridging communities, and providing exposure to new ideas. By engaging many people in a variety of communities, our user representations will begin to emerge. The four makerspace modules provide a varied set of potential setups for a space while keeping flexibility for community decision and feasibility.

Acknowledgements

We would like to thank those who helped make our work possible. First and foremost we thank young people, our peers, which we were able to meet with on our trips; thanks to the CCC, Spring Initiative, Ombudsman, and CCHS students who met with us and all the organizers that helped us connect with them. Thanks to the CRI and CCAC board members, as well as original grant writers who helped us delve into the community. And thanks to all the other community members who took time to talk with us. We're inspired by all of your efforts to continue to make Clarksdale a vibrant community.