

Makerspace for Entrepreneurship for Identity

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ABSTRACT

The makerspace I run is in a K-6 public school setting. Of our 750 students, roughly half will have the opportunity for extended learning opportunities in my makerspace through projects I develop and facilitate with my students' needs and interests at the forefront of my planning. I would like to share reflections on one of the elective classes I teach in this makerspace, which I have been teaching for the past 4 years. The elective class is titled Manufacturing & Entrepreneurship, and I would like to share how the makerspace made way for an entrepreneurship course to develop organically and how that course has been designed to help my 6th grade students discover, develop and share their identities with their community and the world. I will share about how students learn to run a real business, how students learn to design, market, and sell products that people want to buy, and how students have learned that they have the power to create and set a value for things they make. I will also share educator takeaways from the experience of teaching an entrepreneurship class in a makerspace, with a focus on resources for designing a curriculum of identity through any makerspace or career-focused disciplinary unit.

Keywords

Identity; entrepreneurship; makerspace; learning environments;

1. DESCRIPTION

1.1 Description of your setting

My makerspace is in a K-6 public elementary school in an underprivileged community. Our school serves over 750 students, all of whom receive free breakfast and lunch. The class I will be sharing about consists of 17 6th grade students, of which 8 are female, 9 are male, 2 are African American, 7 are English Learners, 1 is a Special Education Speech student, and 2 are Moderate/Severe Special Education students who are mainstreaming in this course. These students come from a wide array of backgrounds. As our school experiences a high transiency rate, most of the 17 students had never stepped foot in our makerspace before they joined my entrepreneurship class, even though my program has been running for the past four years (some students on the other hand have had the opportunity to spend many hours per week in the makerspace over the past 4 years).

1.2 Description of the educational experience

When our community experienced a traumatic mass shooting, the makerspace became a place where our elementary-aged students could make something that helped them process their role in the aftermath. One small group of 4th grade students made a memorial luminary using our laser cutter. They shared it with the school community via the school's Facebook page. Immediately, they received an outpour of positive feedback, inquiry about how young children made such an item, and many "shares" on Facebook. Before the students knew it, their item spread to the city community and they began receiving request after request for more. People wanted to pay the students for these luminaries. So the students began to make more and sell more and before they knew it, they had raised over \$500 to donate to the community relief fund and an entrepreneurship class had been born.

I have learned over the years that our makerspace is a safe-haven for students who need a space to take learning risks, experiment with ideas that other teachers/classrooms do not nurture, and share their growing identities. Our community is in one of the roughest neighborhoods in the most dangerous city in our state. Specialized counselors have trained our staff on trauma-informed teaching strategies as they have shown us that though we cannot possibly know specific numbers, we can assume based on various research, that a large number of our students could be diagnosed as having post-traumatic stress disorders. Understanding the background of my students has lead me to design my entrepreneurship class specifically with student identity in mind. My students struggle with social communication, as many of them have used technology for massive amounts of mindless consumption as a method to cope with areas of need in their lives. My makerspace and specifically my entrepreneurship class is designed to meet the social and emotional needs of my students through specific teaching methods, learning activities, grouping strategies, reflections, feedback, and assessments designed with identity in mind. I have created an entrepreneurship "curriculum of identity" using resources from Carol Ann Tomlinson's *The Parallel Curriculum* by having my students interests at the heart of my curriculum design process, with the intention being to help students engage in and sharpen their sense of self in and through the curriculum. For example, entrepreneurship in and of itself is a career-based, goal-oriented discipline my students study through authentic product development and sales management. As students reflect on the processes they engage in as they develop, refine, and share their products, they are asked to think about such questions as "Do I like what I'm learning?" or "How do people

benefit from this work?” or “Can I see myself doing this type of a work as my future career?” As they engage in these questions both in small groupings and by themselves, they are making continual adjustments to their view of themselves. Ultimately, student participation in my entrepreneurship elective allows for real-life, hands-on experiences with learning how to run a business, but more importantly, it engenders the opportunity for students to learn their preferred forms of communication, their own learning and working preferences, and make decisions about their career goals.

2. CONCLUSION

2.1 Results

In my entrepreneurship class, students are authentically learning how to run a business by running a real business. Since the class has started, students have created and sold various products they are passionate about. The class is designed for students to also explore other career options for their futures through the many other industries that intersect with entrepreneurship. For example, we have had to learn how to legally run a school-based business, how to budget and plan financially, how to brand the business, how to use the internet to market products, how to quickly manufacture high-quality products, and so much more.

Since the entrepreneurship class was born, I have witnessed it become an avenue for my students to develop their identities. Often the students at my school, and I believe students everywhere, these digital natives, struggle with developing their identities in a world where communication is stifled by technology consumption. My entrepreneurship class is designed to have students think about how to share their passions in a way that people from all generations can not only understand, but value. Manipulating technology and materials into products that are meaningful for the community is not only an entry-point into deep learning, but creating with technology with the global community in mind allows for students to move beyond the initial point of entry of powerful learning into user-driven elaboration as students must explore and experiment with the cross-section of their interests and others' financial loyalties.

One very important lesson I'd like to share is that in my class the students must “ship” their ideas (which becomes a metaphor for the students sharing their identities with the world), seek feedback (which is now highly personal through the identity and product connection), and make improvements (grow their own selves as well, through the iterative design process). Students cannot separate their identities from their ideas and the things they make, nor should they. This class is so much more than what on the surface may seem like a simple career technical education-type course. Students are empowered to develop as their own unique selves through the design and iteration of the products they are making. They have the power to create and set a value for the things they make, and entrusting them with that power opens up their creativity to spiral naturally, leading them to feel a sense of ownership in the design process. My Manufacturing and Entrepreneurship elective capitalizes on this idea and builds upon it with a strategic student self-reflection and feedback process, leading to a stronger understanding of identity through the development of an entrepreneurial mindset.

Through the experience of leading this class, I have learned that my role as a maker educator is to be a difference Maker. My students face social challenges that are daunting at the least. Giving them the space and trust to explore and experiment with their ideas allows for them to build relationships with their peers, their community, and the world. Utilizing teaching methods, learning activities, grouping strategies, and opportunities for constant reflection and feedback empowers students to discover themselves through their learning. “Shipping” their products prepares them for life and the society they will shape someday. My job is to put pressure on the students to “ship” often, get their ideas out for feedback, but also to provide a reflective avenue for processing that feedback positively. A makerspace should be a safe place for students to take risks in their learning that allow them to grow into confident people and future contributors to society. Specific teaching methods I incorporate into my Manufacturing & Entrepreneurship “curriculum of identity” include: coaching, visualization, shadowing experiences, cooperative learning, and independent investigation, all of which promote student self-awareness. When thinking about learning activities in the curriculum, I wanted to focus on those which foster analytic, critical, and synthetic thinking, in order to have students draw on their skills and use creative thinking to reach learning goals, both student- and teacher-designed. Some specific learning activities built into my curriculum include: goal setting, decision making, planning of events and activities, and engaging in the daily activities designers and entrepreneurs would engage in to keep their businesses thriving. Grouping strategies are also built into my entrepreneurship curriculum as they promote successful student communication skills at varying levels. Sometimes it is best for students to discuss ideas with similarly-minded peers, whereas other activities are designed to question and expand students' preconceived notions about a topic, in which groupings with differently-minded peers comes into place. I have learned that my young students are very capable of learning how to communicate across generations when it comes to talking about the products they make. Put together, these teaching methods, learning activities, and grouping strategies have resulted in students who are self-aware and confident in making sound choices for their futures. According to our school's Gallup Student Poll on school climate and culture titled “Engaged Today- Ready for Tomorrow,” our students out-rank district and national averages in their levels of engagement, hope, entrepreneurial aspiration, and career/financial literacy, and I believe their participation in our makerspace, and more specifically in my Manufacturing and Entrepreneurship course have contributed to these scores.

I want to be an educator that makes a difference, the type of difference Maker that grows through the successes and failures of my practice. Thus, as I have developed this course over the past few years, I have made changes that more effectively incorporate student discovery of self through focusing questions. The focusing questions drive all aspects of the curriculum. Some of them include: “What do entrepreneurs think about?”, “In which ways is this familiar, surprising, and/or interesting to me?”, “How do entrepreneurs think and work?”, “What are the problems and issues on which entrepreneurs spend their lives?”, “What are the range of possibilities in entrepreneurship?”, “What difficulties to entrepreneurs face? How do they cope with them? How would I cope with them?” and “How might I shape entrepreneurship

over time?" I have found these focusing questions to be crucial to not only students learning about themselves, but for me as a teacher to learn about my students, thus having the ability to more effectively meet their needs, academically, socially, and emotionally.

2.2 Broader Value and Relevance to Theme

I believe the value in my reflection I am sharing is that maker educators have a big role in helping their students cope with their everyday social struggles and develop self-awareness and self-confidence. Teaching entrepreneurship with identity in mind can be a formal avenue for safely and authentically accessing and nurturing students' social and emotional needs. Not only does making through entrepreneurship allow for students to learn a number of helpful skills for their futures, but more importantly, it allows for students make personal and meaningful connections with their peers, community, and their inner selves. Put simply: our kids struggle with figuring out who they are in this chaotic world. But, putting themselves out there through a hand-made product bypasses their fears and gives them challenges and opportunities to communicate across generations and distances. Selling a product validates their growing identities and gives them a voice in the community. Reflecting on their learning through the lense of their personal connectedness to the learning content helps students discover and develop their identities.

3. BIOS

Sarah Emerson is a program specialist and demonstration teacher in the iSTEAM Lab at Bing Wong Elementary School in San Bernardino, CA. She has 4 years experience in this role, leading both teachers and students to integrate career exploration of the STEAM fields, digital fabrication, and hands-on learning. Sarah Emerson is a 2016 Stanford FabLearn Fellow. While under her direction and leadership, the iSTEAM Lab won the National Schools of TechXcellence Award in the category of Makerspace, June 2017.