**Tell us about your startup business in one sentence.**

Chap Research is a non-profit for Westlake students to learn real world technical and leadership skills not normally taught.

**Tell us about your startup business in one paragraph.**

Chap Research was created to provide students with an opportunity to experience and participate in research and design, giving them the experience and confidence to succeed in college and industry. It is an extracurricular program at Westlake that undertakes a variety of projects. However, the reach and impact extends beyond just Westlake. For example, the close connection with industry helps link students to mentors in the community to inspire and support their development. The various projects undertaken by the program allow students to develop industry-applicable and entrepreneurial skills not taught in school, such as management and creating patentable intellectual property. Students can then develop their pre-college portfolios by receiving patents, publications, and other exposure that recognizes their skill and dedication. We expect Chap Research to serve as a model and inspiration for similar innovation programs at the high school level.

**Describe your target market.**

While Chap Research is primarily focused on teaching students, it serves (and utilizes) a variety of individuals and organizations. Each constituency both contributes and benefits from Chap Research, but students, educators and STEM-related companies all make up the "target market", because they must be convinced of the value of the program before they contribute to and benefit from Chap Research.

Arguably the most important market for Chap Research is the students. Chap Research is selecting dedicated and enthusiastic students willing to work after school several times a week on a variety of research and development projects. These individuals apply for the program toward the beginning of their high school career. They then move up to leading projects, gaining greater responsibility and skills as they advance within the organization. While Chap Research is starting with Westlake students, it has already begun inspiring individuals and organizations in the area. Eventually Chap Research will be able to impact students across the nation, as other student leaders create and participate in remote branches of Chap Research or are mentored by Chap Research individuals.

Chap Research is also targeted at educators across the country as it works to convince them of the value of creating their own innovation programs. While Chap Research is designed to be student-focused and student-driven, these teachers, mentors and parents are inevitably involved as they provide the teaching resources for the students and ensure continuity of the program (as students graduate). These skilled and enthusiastic individuals teach and engage the students, providing background in a variety of fields.

Lastly, Chap Research targets STEM-related companies and colleges. These institutions offer facilities, free technology, funding and internships. They also contribute industry professionals and college faculty to serve on Chap Research's Advisory Board, which supports the organization by making connections and reviewing presentations, papers and project ideas.

**How will your products or services benefit your target market?**

Given the diversity of the target markets, the benefits to each category differ greatly.

Colleges and companies benefit from Chap Research by gaining access to some of the brightest and most dedicated students in the area, giving them opportunity to influence those students to apply to or work for their organization. In addition, having Chap Research use their products works as both promotion and testing for the products. The students provide feedback on the use of the technology, help edit documentation, and demonstrate the device. These institutions are also able to feel good about helping support STEM innovation in the community and get to check off the "outreach" box of their charters.

For educators, Chap Research is a rewarding way of engaging and teaching students in ways that are not possible in a classroom environment. The mentors/teachers/parents see tangible results as proof that they have made a positive impact on students, as well as getting to participate with the kids on cool projects.

Finally (and mostly importantly) the students receive a variety of benefits. Because of the project-based, innovation-driven approach of Chap Research, students learn real-world skills not taught in school. These include (but are not limited to): management, marketing, patent application, PCB design, database management, website design, etc. For example, products such as the ChapR, a Bluetooth remote for robots, take students through every step of a start-up (see “ChapR” submission for details). Furthermore, these projects give students opportunities to expand their portfolios through news articles, patents, publications, etc. In the case of the ChapR, the tangible reward was the patent received, as well as the variety of press coverage. Other projects, such as the MXP board, allow students to network with industry professionals. In the MXP project, National Instruments commissioned Chap Research to create an add-on to the roboRIO (a robot controller they developed). This opportunity allowed Chap Research students to work with several industry individuals, learning the tools and software used in a real business.

**Identify your primary local or national competitors.**

Because of the format of the classroom, high school students are conventionally taught through rubrics, memorization and written tests. This leads to a lack of essential skills such as management, creativity, and technical innovation -- fundamental parts of any business. Unfortunately, there are very few programs or activities that address this gap. Though FIRST robotics is beginning to fill this need, it is still mainly focused on the competition aspect rather than creating entirely new products. Since Chap Research is the first innovation program of its kind at the high-school level, it only has to compete for students' time and focus; there no real competitors.

**How will your startup business be different than these competitors?**

Unlike coursework or other extracurricular activities, Chap Research offers students the ability to create, design and research in a wide variety of areas. These projects give students experience in leadership and management, allowing them to lead others. Even completing projects gives students the confidence and inspiration to continue to pursue innovation. Furthermore, the projects allow students to receive individual recognition for their work, rewarding dedication with tangible items such as patents, publications, news articles, etc. which offer a unique advantage when applying to college.

**What will you need to launch your startup business?**

To continue laying down the foundation of Chap Research (and expanding upon its current state), we need a sustainable system in place for training new students and giving experienced students leadership opportunities. To do this, we are enacting an experienced-based "teaching" requirement, mandating that older students give seminars on the skills they've learned in the program. In addition, we need a steady supply of dedicated younger students, which we are working towards by improving the visibility of the program.

Chap Research also needs money for website services, travel to conferences and meetings, equipment for projects, etc. We already have a small (shared) room at Westlake, but at some point we will need to expand into a larger space to support more students, projects and equipment.

**What will it take for your business to be profitable?**

As a non-profit enterprise, our success depends on delivering value to our donors by using the funds for the purpose they intended. To be successful Chap Research needs facilities, funding, dedicated students, project ideas and experienced students/mentors. All of these have been accounted for except for funding, though we can turn to small donations from parents or local companies as needed. Since our money is managed through the nonprofit company Westlake Eanes Science and Technology Association (WESTA), we can accept tax-free donations from businesses. This initial money would be used to pay off our debt to WESTA and other investors, allowing us to focus on spending money on expansion. Once we grow to this point, the program would stay profitable (or more accurately, sustainable) by getting grants from industry partners, as these companies pay us to worth with their products.

**How will you acquire new customers?**

To acquire students to participate in the program, we plan to publicize our organization within the high school. This includes promotional activities such as putting up flyers, posting on the website and working with the Westlake newspaper and video crew. There are already many students that have heard of us receiving the patent for the Chap Remote, so we expect a high level of interest among students. To help with the succession planning, we are only accepting current freshmen and sophomores, so that they will have time to learn skills within the program, then turn around and teach others.

In addition, we can reach our other target markets (educators, more distant students and companies) through our website, news articles, events showcasing our projects (TEDx and Maker Faire for example). We also plan to present at robotics competitions (we have submitted an abstract for FIRST world championships). When we are ready for expansion beyond Westlake, we will begin going to school boards and visiting other STEM groups to promote the proven framework of Chap Research.

**Describe your unique skills, expertise, and experience that will make your startup business successful.**

I have been a student lead on two robotics teams, so I have experience managing technical projects. Since I have also been giving presentations to judges since freshman year, I have experience with public speaking and marketing. Using these skills, I've been leading Chap Research since its founding, striving to give other students the same opportunities for innovation that I gained as the lead inventor on the ChapR patent.

I was the project lead on the Chap Remote, writing the software for the ChapR and filling in all the gaps on our team. As part of this I managed manufacturing of the ChapR, sitting down and soldering ChapRs myself as needed. Then when we began receiving too many orders, I designed the customer-orders database we use to keep track of the large volume of orders we receive. In addition, I was also involved in the patent process, working with several patent lawyers over the course of the year. I also designed and maintained the website (www.thechapr.com) writing a large part of the content. In this marketing role I also created flyers and commercial. I even marketed directly to customers, walking around giving demos and sales pitches about the ChapR at robotics competitions.

When we created Chap Research, I became the CEO of the program, working long hours to create the infrastructure for the program. As part of this effort, I created the framework of our website ([www.chapresearch.com](http://www.chapresearch.com)), directing and teaching students to fill in some of the content. Because I’m very detail-oriented and organized, I’ve been able to keep track of the variety of projects we have running. However, my big picture focus also allows me to make sure we are working toward our goals, allowing me to participate in board meetings and have an active role in determining the direction of the program. My variety of skills allows me to fill in gaps on the team and serve as a mentor to the younger students, teaching management, electronics, software and hardware skills (as in the Fruit Spiral project, for example). However, I’ve learned that it is sometimes more important that I am also able to step back and act as a mentor rather than a manager as I let other students lead their subteams.

**Identify the unique skills, expertise, experiences, relationships and resources each of your team members possess that will help make this startup business successful.**

The team itself is made up of several dedicated and experienced high school students. Between all of the students, they have experience in hardware, marketing, software and electronics. For example, hardware skills include: computer assisted design (CAD), 3-D printing, machining, etc. Electronics skills range from soldering and wiring to bread-boarding and PCB design. Through our various projects, we’ve taught and learned software skills such as embedded programming, web design, database creation, and networking. Though we’ve done relatively limited marketing, the team also has experience with making flyers, websites, business cards, and commercials.

To provide continuity (as students graduate) and draw upon professional experience, Chap Research operates under an oversight committee (which functions as a Board of Directors). The members of this small group include a venture capitalist, an experienced, award-winning Westlake educator as well as a high-tech CEO. All very dedicated and involved in the program, the members of the oversight committee each have connections and experience in their field to teach and guide the students. As CEO, I meet with the committee to review various projects and status on a monthly basis to give students a sense of responsibility and make sure everything is on track.

Meeting less often, but on a larger scale, is the Advisory Board. The board is made up of several college faculty members and industry individuals. These people provide resources, connections, material review, project ideas and other industry support to the program.

**Explain the potential impact your business is going to have on its local community.**

Chap Research could become an inspiration for other innovation programs at the high school level, helping found other programs of its kind in the community. This is already occurring on the individual level, as presentations such as the one at TEDx are inspiring individuals to start projects on their own (to potentially be featured on our website).

However, Chap Research projects themselves have already directly impacted the community. For example, the Chap Remote earned a lot of press coverage for Westlake High School, since few patents are awarded to students in a public school. This visibility has helped to instill a sense of pride in the community and demonstrate Austin’s technology leadership and innovative spirit. This awareness of the importance of STEM education in our public schools might inspire more knowledgeable workers to relocate to Austin or even entice other companies to invest more in Austin.