

## **TKH Module 7 Assignment: Finding Solutions to Community Issues**

**Define a community problem you want to solve with technology and the people who it affects that you want to serve.**

The educational inequality in the NYC public school system has been the norm for a long time. It has become synonymous with budget cuts and increasing class sizes, in many low-income and highly diverse areas of NYC. There is a great disparity between the demographics in high performing high schools and underperforming high schools throughout NYC. Some of the greatest differences are gravely apparent at the high school level. Especially when seeing the NYC Specialized High Schools, which rank amongst some of the best high schools in the country. These high schools have historically scored higher on exams and college acceptances than the rest of NYC high schools and its alumni have garnered many accolades not limited to, but including, Nobel prizes in the sciences, mathematics, and other fields. Consistently high performing, these high schools have also consistently not been as diverse as the demographics of NYC and the boroughs in which they are located. The word diversity, for this discussion, refers to the racial and socio-economic backgrounds of students. As of 2016, according to the NYC Dept. of Education, out of the student population that was offered a seat amongst one of the eight NYC Specialized High Schools, only 40% were considered to be from a low-income background, while 75% of high school students in all of NYC are considered low-income students. Moreover, out of all the students offered seats at these same high schools, only 9% of those students were Black and Latino students, while Black and Latino students make up 68% of the entire NYC high school population. Lastly, 50% of all admissions offers to these high schools went to students that were from only 4% of middle schools in all of NYC. Meaning that 96% of middle schools were not represented in that year's accepted students and did not have any students that were offered a seat at a specialized high school. The statistics show that the racial and socio-economic demographics of the Specialized High Schools do not match, or even come close to, the demographics of NYC.

Admittance to the NYC Specialized High Schools is dictated by how well a student scores on the Specialized High Schools Admissions Test (SHSAT). The SHSAT centers around testing students on the subjects of mathematics, reading comprehension, and logic. This single exam is the sole indicator of a student's potential for exceeding at these top high schools, and it is the only factor taken into account for admittance to some of the most academically rigorous public high schools in NYC. Many have an issue with the exam, and feel that the admissions process must be changed away from a single exam. Others believe that a single exam that tests for basic academic standards is as close to a non-biased blind admissions process, as far as school acceptances go. It has been a topic that has been up for debate for many decades, but has

time and again, been left as is for the time being. At the same time, the statistics, every passing year, show us that the demographics at our top high schools are not reflecting the majority of communities that make up NYC. There needs to be a solution for the immediate issue at hand, besides waiting for the admissions test to change.

The current admissions process and its results have shown that there is a need that is not being met for students from the other 96% of middle schools that are not being represented in the student population of the Specialized High Schools. There are several factors that need to be addressed with the entrance exam. First, familiarity with the exam, which includes knowing about the purpose of the exam, the format of the exam and the conditions in which it is given. Many middle school students and their families are not very familiar with the exam and what it is actually testing. Learning and practicing mathematics and reading comprehension are already part of the middle school curriculum, but it is not tested in the same intensely timed conditions as the SHSAT. In addition to that, the exam's third component, logic problems, are not part of the normal public middle school curriculum. Preparing more students of different racial and socio-economic backgrounds for the exam, is the best approach to increasing the diversity in our top high schools (with the current exam). However, the issues arise as to how the logistics of learning and studying the material will occur, if students are not getting enough of it at their current middle schools. We are hoping to provide a better solution that would supply easily accessible academic and mentoring support to minority students from lower socio-economic backgrounds and help them on the way to admittance to some of NYC's top high schools.

### **Write a full description of your application that would solve the present community issue.**

To help alleviate the educational inequality in NYC, there is a need to develop a web application that can meet the needs of those who want to learn and those that want to teach. There needs to be a better way for students who need tutoring for the exam to connect with individuals who can tutor the material. Also, the tutoring services would need to be at a low-cost, preferably free, since the students we want to target and help with this application come from low-income backgrounds. Essentially the tutors need to be individuals that are willing to volunteer their time and expertise. Tutors and mentors will be students currently attending high performing NYC high schools, including those that are currently students in one of the following NYC Specialized High Schools. Along with academic support, students could also benefit from mentoring that will help them adjust to the type of rigorous learning environment that exists at the Specialized High Schools. Since the ultimate goal is not just for students to be accepted into the schools, but also to succeed in those schools. The third aspect of the web application will provide information about nonprofit organizations in different communities in NYC, that help

provide different socio-economic services and aid, for those students that need further assistance and resources.

The web application will host the information of three main groups: middle school students looking for assistance, tutors/mentors (high school students), and nonprofit organizations. Once, a network of students and tutors is established, they need to be able to connect and coordinate a time and place for tutoring sessions. Students can log in and search for tutors/mentors in different parts of NYC, and request a tutoring/mentoring session. This would be similar to searching on a browser and scheduling a restaurant reservation. The difference would be that students would search for tutors/mentors in general locations in NYC and with specific tutoring subjects, such as: mathematics, reading comprehension, and logic. Meeting places for tutoring sessions would be public spaces, conducive and safe for learning, such as a NYC public library or community rec center. It would be highly encouraged to continue with the same tutors/mentors, if there is a good connection and students are benefitting from the tutoring/mentoring that is being provided. This would help promote consistency in study habits for our middle schools students. The web application will assist in storing information and creating a database of middle school students needing tutoring, volunteers willing to tutor/mentor, and information on the tutoring/mentoring sessions (when/where do they occur and the material covered). For volunteers, the website would provide a viewable record of all of their volunteering hours and notes on each session. This will be important for providing proof and reporting of volunteering hours to their respective schools and organizations.

Nonprofits and their services would be hosted under a different section of the web application. The bare minimum information required from nonprofit organizations will be contact information and services offered. Students and their parents will be able to choose from a list of socio-economic services offered, and the search results will show all the associated nonprofit organizations that offer that service. Users will be able to then click on each organization's name and be provided with their website and contact information.

Another section of the web application will host current information about the SHSA, the overall general NYC high school application process and any important external links for further information, for the benefit of students and their families (in both English and Spanish). The inclusion of a small chat feature between students and tutors/mentors is a possibility. There are already some existing nonprofits that provide similar services to those proposed for this web application, but they mostly cater to specific neighborhoods or schools. In the future, we would be open to integrating part of their tutoring/mentoring networks into our databases, as the number of students using our web application grows and demand increases.

## **Lean Business Canvas**

### **Problem Definition:**

Shrinking the educational inequality in the NYC public school system. Specifically targeting the lack of diversity in NYC's top high schools, that is not representative of the diversity of NYC's population. NYC's top public high schools include the Specialized High Schools, which have some of the best funding out of the NYC high schools, from the Department of Education and private donors. In NYC, there is a large problem with the quality of education at underserved schools that stem from lack of funding at the educational level and lack of additional resources available to students to make up for learning environment deficiencies. The student population at the Specialized High Schools does not represent the diverse (largely Black and Latino) and majority low-income populations of NYC's middle schools. Many blame the entrance exam, SHSAT, for this lack of diversity. However, the real issues with not being able to pass the exam have more to do with students lacking the resources, at underserved middle schools, to be set on their way to succeed on the entrance exam. There are existing small scale solution alternatives for tutoring (most require payment, some are free) and mentoring. However, most low-cost tutoring and mentoring is neighborhood based, and does not reach a large number of middle school students that need help in underserved areas of NYC. We are looking to tackle the lack of representation of the largest demographics in NYC, and of the majority of middle schools, within the top NYC high schools by increasing the amount of Black, Latino, and low-income students that are offered admission into the NYC Specialized High Schools.

### **Customer Segments:**

Students from diverse Black and Latino demographics and lower socio-economic backgrounds, that have a target goal of getting accepted into high performing high schools that are academically rigorous, specifically any of NYC's Specialized High Schools. Hoping to mainly target, but not limited to, middle school students (5th grade to 8th grade) who are in underperforming middle schools, but have academic potential to possibly pass the SHSAT.

Volunteer tutors would be the second target group. Tutors and mentors will be students currently attending high performing NYC high schools, including those that are currently students in one of the following NYC Specialized High Schools:

- The Bronx High School of Science

- Stuyvesant High School

- The Brooklyn Latin High School

- Brooklyn Technical High School

- High School for Mathematics, Science, and Engineering at City College of New York

High School of American Studies at Lehman College  
Queens High School for the Science at York College  
Staten Island High School

The Fiorello H. LaGuardia Arts High School was excluded for this proposal, since its admissions process requires strong arts backgrounds and does not require the SHSAT for admittance. Students that are part of NYC Specialized High Schools and other high performing high schools strive to meet volunteering hours requirements for admittance into The National Honor Society. Membership into this society is considered one of the greatest academic honors that a student may receive in their high school career and extremely coveted for college admissions prospects. Volunteering is also an integral part of many other school activity clubs, such as Key Club and Amnesty International student clubs. Requirements and proof of volunteering hours are needed for all of these honors and activities. High school students can also serve as mentors, if they require additional volunteer hours. They can provide guidance to middle school students on effective study habits that can help them excel at high performing high schools in the near future.

An additional aspect of our web application will include non-profit organizations, whose goals align with helping students and families from lower socio-economic backgrounds that aspire for better educational opportunities. By connecting them on the same platform as students, non-profit organizations can offer their services to a wider range of students.

### **Solution:**

Creation of a web application that connects minority students from lower socio-economic backgrounds to potential tutors, mentors, and non-profit organizations that can help support their efforts to improve academically, in order to increase their chances of being accepted into one of the NYC Specialized High Schools. The web application will hold a database of middle school students needing tutoring, volunteer tutors and mentors, and nonprofit organizations that students can reach out to for additional resources.

Volunteer-based tutoring offers a free resource for students (and their families) that come from low-income backgrounds, but still want to study and excel on the exam. Middle school students starting from 5th grade to 8th grade will be eligible for tutoring, mentoring, and non-profit aid through our web application. It is encouraged for students to start becoming involved with the tutoring and mentoring experience as early as possible, in order to foster good and productive study habits that will also have a positive effect on their schools grades, especially mathematics and reading comprehension. These benefits will be in addition to their potentially higher SHSAT score and possible admissions into one of the Specialized High Schools. If the students do not get an offer to a Specialized High School, we hope that the tutoring and mentoring they received, through using our web application, has a general positive effect on their academic performance at school. Therefore, also increasing their chances at

gaining admission to other high performing high schools in NYC, that may not be Specialized High Schools.

For high school students that are tutors and mentors, the web application will facilitate the students' ability to find volunteer opportunities and report volunteering hours to their school's volunteering network, by utilizing an interface in which they can log in and keep track of their volunteering. High performing students in need of volunteer opportunities would benefit from the ease of use of our web application.

Many of the nonprofit organizations currently in NYC are neighborhood based, while others are specifically associated with colleges (such as Columbia University). The need to reach larger audiences, even in the neighborhoods that they serve, is a vital mission of these organizations. Our web application will integrate the services of these nonprofit organizations, along with their intended geolocation target areas (based by zip codes), into our database for students to be able to locate services that they may need. This aspect of the application is important, since students may need supplies and other resources that may not be available to them at school or at home, such as testing materials, or a quiet place to study and simulate testing conditions. Providing additional resources that compliment tutoring are vital to help them on their road to academic success. Being able to bring together students, tutors, mentors, and nonprofit organizations together under the same searchable database will allow for users be easily better connected and gain the most from the services offered. We are hoping to bridge the gap between NYC demographics and NYC Specialized High School demographics, through accessible free rigorous academic support and mentorship that would allow low-income diverse students to succeed at NYC's top public high schools.

## **Key Metrics:**

To measure the effectiveness of our web application, we would track and store data about different aspects of the progress and use of our web application. The first key component of metrics that we would actively have to keep track of would be the number of middle school students, tutors, mentors, and nonprofit organizations that have signed up to use our web application, along with their frequency of use, after signing up. Recordkeeping of the amount of hours spent tutoring and mentoring middle school students, by high school students, is an integral part of the web application that can also serve as an important indicator of its continuous and ease of use by student users. The key metrics that would be vital to seeing the web application's success in its mission statement would be final SHSAT scores and admission offers to our middle school students. Middle school students would also be applying to other top high schools that are not part of the Specialized High Schools, but that also require good grades for admissions. The success of students also getting into these high schools will also be recorded for metrics purposes. All admissions offers would be direct indicators of how well all the different groups on our web application have interacted for the greater goal of increasing the amount of

racial and socio-economic diversity in NYC's top public high schools. Lastly, ongoing surveys asking about the user experience on our web application will allow us to improve and better serve our users.

### **Unique Value Proposition:**

Our web application based solution to decreasing the lack of diversity in high performing NYC public high schools will be tackling different issues that possibly contribute to a students' academic underperformance. Other existing solutions tend to only address one aspect of the issues at a time, such as tutoring or mentorship. Our inclusion of nonprofit organizations, in our web application, will allow for more of the socio-economic factors that may be hindering students' learning to be addressed. The additional ease of connectivity between the different groups will allow for a greater reach out to users across the five NYC boroughs, and not just those that are associated with a specific school or a nonprofit organization. It would also include an online tracking system for all scheduled tutoring and mentoring sessions, for ease of reporting volunteering hours. An aspect of our web application that would appeal to busy high school student volunteers.

### **Channels:**

Our web application solution will be available online in the form of a website, as that would be the most easily accessible form for most of our users. We decided against phone or tablet applications, since one of our main drivers is accessibility for low-income students. As a website, students would be able to access our services from any computer with working internet, such as in school and NYC public libraries. Access to our web application and signing up to be a user will be free. For user account registration, there will be steps for identity verification of all parties involved. For minors, parental approval for making user accounts will be necessary. Ease of use of the web application will be one of our main drivers, since it needs to be accessible for anyone ranging from middle school students to adults. From the website's home page, there will be clear instructions and clickable links to take users on a step-by step progression based on what they need from our web application. There will be a FAQs page on our website explaining how to further use different aspects of our web application.

### **Unfair Advantage:**

The web application takes into consideration different aspects that affect a student's academic performance, that go beyond what is taught in school. The fact that we will help provide a connection to other nonprofit organizations that can help alleviate some of the socio-economic issues that students are facing, is a more complete solution to tackling the issue of lack of diversity at top NYC high schools. The accessibility of all our users to each other, will

also help increase the amount of resources provided to students, in one single place. We hope that our proposal will be seen as a good solution for the lack of diversity at NYC's top high schools, and will be encouraged by NYC's Department of Education as a valuable resource. NYC's Department of Education already provides many datasets that can help us narrow down the areas and underserved middle schools that would benefit from the services offered by our web application. Our team will consist of individuals that are highly familiar with the process of Specialized High School Admissions. This includes our founder, who is a minority Latina that went to an underserved middle school in the Bronx, and was able to gain admissions and attended The Bronx High School of Science. There were many aspects that made for a difficult transition, including the difference in academic rigor and school culture that students may not be familiar with. Students would benefit from tutoring and mentorship, to increase their chances of success at these high performing NYC high schools. Coming from a low-income background and attending underserved middle schools, presents its own unique set of challenges that can hinder student academic performance. Having a personal account of that experience will help in better catering to our users' needs, through our web application. We will also hope to have the support of the Bronx High School of Science Alumni network to address the ever increasing criticisms that the Specialized High Schools have received in terms of diversity and inclusion. Parental involvement throughout the process will also be encouraged with progress reporting and feedback of tutoring and mentoring sessions.

### **Cost Structure:**

The development of our web application and its running components would be considered to be one for a small-to-medium size company, since there will be the need to store user information and databases tracking volunteer hours and nonprofit organizations' available services. Due to the interactive elements of searching through our databases and matching students to tutors/mentors, and the added volume of information of all tutoring/mentoring session feedback data, we would consider our web application project to be on the scale of a small-to-medium-sized company websites. Costs will include, but are not limited to, our web domain, SSL Certificate, Website Hosting, Content Management System, New Website Design, Responsive Web Design, and Social Media presence. This would put our initial development cost between \$15,000 to \$30,000. We anticipate that the operating costs after the initial website design will be between \$2,000 to \$7,000 per year. Operating costs would be dependent on the amount of users that sign up and use our web application, since data storage for recordkeeping and metrics will need to be expanded.

### **Revenue Structure:**

Possible educational advancement grants will also be an area we will explore to acquire initial funding for development of our web application. Resources to keep our web application



running will come mostly from the ads section, that would feature many NYC local businesses and sponsors of our web application and our partnering nonprofit organizations. If need be, we will expand to having a second ad section towards the bottom of our webpage. Donations from possible sponsors and NYC Specialized High School Alumni networks would also be factored into our revenue structure. Revenue will be used for operations and further innovating costs of our web application, and not to make a large margin of profit.