Building and Growing a High School Computer Programming and AI Club

Thomas C. McKinley

Junior Student

Boston College High School

Boston, MA

zcp8802@gmail.com

Abstract — **In today's world, technology is everywhere, and it's important for high school students to learn about computer programming and the impact of artificial intelligence (AI). When I started the Computer Programming and AI Club at Boston College High School in 10th grade, we only had three members. By using a mixture of creative marketing, fun activities, and teamwork, I helped grow our club to 16 members the following year, peaking at 43 people signing up during the school's club fair.**

At first, it was hard to get people to join because not many students knew about the club, and some thought programming and AI were too hard. To fix this, I made posters, set up an interactive booth at the club fair, and talked to students about how cool and useful programming is. We also made the club more fun by working on projects like analyzing Boston Blue-Bike data and creating a geographical map of bike distribution to add more challenges. We also worked on web scraping projects for gaming to make learning fun. Our club invited professors and engineers to host seminars, providing research insights and inspiring members. I also led my club members in carrying out AI research activities and promoting the knowledge and concepts of machine learning and AI among my high school peers. I made sure the club was welcoming for beginners but still challenging for students who already had experience.

These efforts didn't just grow the club's size; they also made it a great place to learn and connect with others who are passionate about technology. This experience shows how students can start and grow a successful club by being creative, organized, and open to everyone.

Keywords — High School Club, Student Leadership, Teamwork and Collaboration, Marketing and Outreach, Club Growth, Computer Programming, Artificial Intelligence (AI), Machine Learning, Data Analysis, STEM Education.

I. INTRODUCTION

In today's rapidly evolving technological environment, it is increasingly important to understand computer programming and artificial intelligence (AI). As a future workforce, it is imperative that high school students understand and have skills in this field regardless of their eventual careers. Recognizing this need, I took the initiative to start a Computer Programming and Artificial Intelligence Club at Boston College High School during my 10th-grade year. The journey of starting and expanding the club was both challenging and rewarding, providing valuable lessons in leadership, organization, and engagement [1].

When I first started the club, participation was low, with only three members attending meetings. Lack of knowledge about the club and misconceptions about how difficult programming was posed as significant barriers. Many students were either unfamiliar with the subject or assumed that coding and AI were too complex to learn. Overcoming these barriers required a strategic outreach and engagement approach.

Additionally, high school students often have busy schedules that make it difficult to carve out time for extracurricular activities. I realized that for the club to be successful, it needed to provide clear value and excitement to prospective members. Students had to see programming and AI as more than just an academic pursuit, but as a fun and engaging way to build useful skills.

II. STRATEGIES FOR GROWTH

To attract more members, I implemented a multifaceted marketing strategy [2]. I created eye-catching posters and posted them around the school, highlighting the benefits of learning programming and AI. At the school's club fair, I set up an interactive booth where students could see firsthand how coding and AI can be both fun and useful. Engaging demonstrations helped spark students' interest. I wrote a simple AI application that encrypted a passage using a Caesar cipher on the booth's computer, and students could design personalized secret phrases or change the encryption rules for coding challenges.

In addition to promotional efforts, I also focused on making the club experience both enjoyable and educational. We launched engaging projects that allowed members to apply their programming knowledge to the real world and working on web scraping related to gaming, making the learning process exciting and relevant to students' interests. These hands-on experiences not only made learning more interactive, but also

demonstrated how programming can be used to solve real problems.

To maintain interest, I also introduced a reward system to encourage participation. Members who actively participated in projects and meetings were awarded small prizes or leadership opportunities within the club. This incentive helped to maintain participation and motivation.

III. INCORPORATING AI AND RESEARCH ACTIVITIES

As the club grew, I sought ways to deepen members' understanding of AI. I organized AI research activities, encouraging members to explore fundamental machine learning concepts. One of our most successful projects in the Computer Programming and AI Club was analyzing Boston Blue-Bike data [3-5] to predict bike distribution in docking stations and create a geographic visualization of bike availability. We collected and cleaned historical trip data, conducted exploratory data analysis to identify trends, and visualized station usage patterns with graphs and heatmaps. Using geographic mapping tools like GeoPandas and Matplotlib, we plotted docking station locations and availability. We then developed predictive models, including regression and time series methods, to forecast bike distribution based on factors like time of day and weather. The project will conclude with a dashboard showcasing real-time predictions and insights, demonstrating the practical applications of data science and machine learning in urban planning [6-7].

To further increase interest and expand horizons, I invited the professors who I was doing internship at Northeastern University as guest speakers. They provided insights into current AI advancements and career opportunities in the fields in real-world applications such as healthcare, finance, robotics and natural language processing, which expanded our understanding of the fields beyond simple coding exercises. This exposure inspired several students to pursue AI-related projects and even consider careers in computer science.

IV. CREATING AN INCLUSIVE LEARNING ENVIRONMENT

One key factor in the club's success was fostering an inclusive and supportive learning environment. I recognized that students have varying levels of experience, so I ensured that club activities are accessible to both beginners and advanced members. For beginners, we provided introductory sessions on Python basic programming concepts, while more experienced members took on advanced projects and helped mentor newcomers. This mentorship dynamic not only strengthened the club's sense of community, but also reinforced members' understanding of the material by teaching others.

To ensure that all members were able to keep up, I also created a structured schedule that gradually introduced new topics. We started with simple coding exercises, such as writing interesting basic Python functions such as determining leap years, finding prime numbers, calculating the greatest common factor (GCF) and least common multiple (LCM); and then gradually progress to more complex topics, such as data analysis and machine learning algorithms. This step-by-step approach allows students to gain confidence in their skills without feeling overwhelmed.

Another important factor in inclusivity is encouraging participation from underrepresented students in technology. I actively reach out to students who might not have considered joining a programming club, emphasizing that no prior experience was necessary. By maintaining a welcoming and friendly atmosphere, we were able to attract students with different backgrounds and interests.

V. CONCLUSION

Starting and growing the Computer Programming and AI club at my high school was a challenging but rewarding task. By employing effective marketing strategies, engaging students in real-world projects, and fostering an inclusive learning environment, these efforts have tangibly sparked student interest and significantly increased participation. By the second year, the club had grown to 16 active members, and at the next school club fair, 43 students signed up. This growth demonstrates that a well-structured and engaging club can successfully spark interest in technology among high school students. This experience is a testament to how passion, creativity, and perseverance can transform an idea into a successful and impactful initiative. Through this club, students not only gained technical skills, but also discovered a shared passion for innovation and learning. Students who were initially skeptical of their ability to learn programming have gained confidence in their skills, and some even plan to pursue computer science in the future. The club has also fostered teamwork and problem-solving skills, which are valuable outside of the field of programming.

From a personal perspective, leading the club has provided valuable experience in organization, communication, and leadership. I have learned that adaptability and creative problem-solving are important when faced with challenges. Moreover, this experience has reinforced in me the power of peer-driven learning and the ability of students to inspire and educate one another. My experience has shown that with dedication and the right approach, it is possible to create a thriving student-led organization that can make a meaningful difference in a school community.

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