

# **CHC Institute 2025 Annual Report**

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# 1. Introduction

In response to the rapidly changing industrial structure, STEAM education has become essential to helping children develop basic skills in science and technology. Through STEAM education, children acquire analytical, problem-solving, and innovative skills, as well as practical experience in STEAM fields, which leads to successful careers in these fields. Moreover, introducing STEAM concepts at an early age stimulates children's natural curiosity and interest and prepares them for a future where technology plays a significant role.

Despite the progress made in STEAM education, a significant gap remains in access to this education among different socio-economic groups. Many schools in underserved communities do not have adequate STEAM resources, curricula, and qualified teachers, which limits their ability to provide high-quality STEAM education opportunities.

To address this inequality, the organization was established to raise awareness of STEAM education among disadvantaged children and their parents and to increase their access to STEAM educational opportunities. As a nonprofit organization, we are committed to promoting equality in STEAM education by offering free, high-quality STEAM programs to children in underserved communities.

## 2. Overview of CHC STEAM Programs

### 2.1. Objectives of the STEAM Programs

The objective of our STEAM programs is to develop students' STEAM competencies, including problem-solving and collaboration skills, through hands-on, group projects activities. These experiences enable students to identify real-world problems, create solutions, and test them through experimentation.

**Improving problem-solving and critical thinking skills:** Children develop multifaceted problem-solving skills by applying their knowledge to real-world STEAM problems. They learn through trial and error, combining logical thinking with creativity. In particular, we focus on helping them develop skills in problem definition, information gathering, creative solutions, proposing, a step-by-step approach, analyzing results, and suggesting alternative solutions for improvement.

**Strengthening collaboration and communication skills:** Through team-based projects and group activities, children develop effective communication and collaboration skills. They learn to share ideas, listen to one another, and work together to find the best solutions.

**Increasing interest and knowledge in STEAM subjects:** The program successfully enhances children's interest and knowledge in STEAM subjects by engaging them in enjoyable hands-on activities that utilize various STEAM educational resources.

### 2.2. Educational Methodology and Features

Our STEAM programs are designed and managed by Dr. Lan Joo, the Founder and CEO of the organization. Dr. Joo is responsible for developing the content and curriculum, preparing STEAM learning resources, securing instructors, ensuring the quality and effectiveness of the program, and writing the program's impact evaluations. Additionally, she establishes partnerships with individual schools and institutions.

Dr. Joo developed STEAM programs for students in grades K-5, understanding the importance of introducing these concepts at an early age. These experiences help shape children's cognitive and reasoning abilities, fostering their creativity and innovation for the future.

The program features hands-on group projects guided by instructors, emphasizing both theoretical concepts and practical applications. The features of the program include:

### 2.2.1. Hands-on, Team-based Project Learning

Our STEAM programs, led by Dr. Lan Joo, are designed to actively engage students in grades K-5 through hands-on, team-based group projects. This teaching method connects classroom learning to real-world problems, enabling students to identify problems, develop solutions, and test their ideas/solutions through experimentation. Each group works on a specific project that requires collaboration to produce tangible results. This experience gives children not only the opportunity to acquire knowledge but also to produce meaningful outcomes through teamwork.

First, the STEAM program focuses on **hands-on projects** that encourage groups to apply concepts to real-world situations. This approach helps children see the connections between ideas and their everyday lives. Additionally, facing and overcoming challenges during a project teaches valuable lessons in perseverance, resilience, and problem-solving. Completing these hands-on projects provides children with a sense of accomplishment, boosting their self-esteem and confidence in their abilities. When children are actively engaged and take ownership of their learning, their motivation increases, making the learning process more enjoyable and effective.

Second, we use **team-based group activities** that provide children with valuable experiences in collaborative problem-solving process. This approach encourages discussion and teamwork, allowing children to share their ideas, listen to one another, and work together to find the best solutions. Through these activities, children learn to collaborate effectively by leveraging each other's strengths and compensating for weaknesses. Engaging in group work also teaches children how to cooperate with different individuals and teams as they strive to achieve a common goal.

Third, our instructors present students with realistic and complex problem situations, along with **guided questions** to enhance problem-solving skills. This approach encourages children to actively find solutions. Our instructors ask open-ended questions such as, "How could you approach this differently?", "What do you think will happen?", "Why do you think this has occurred?", and "Are there alternative solutions you can consider?" These questions stimulate students' thinking processes and encourage them to explore various problem-solving options.

### 2.2.2. Use of Various STEAM Educational Resources

The organization employs various STEAM kits and educational resources to enhance children's understanding and application of STEAM concepts.

**Virtual Reality (VR)** is used in science subjects, providing an interactive and immersive learning experience that allows students to participate in virtual field trips to museums, natural environments, historical sites, and even space. These experiences help children visualize and interact with complex concepts.

**Science and Engineering kits, Robotics, LEGO, and coding robots/apps** are utilized to teach science, technology, and engineering subjects. These kits enable students to grasp STEAM concepts and apply them to produce specific projects in real-world settings. Through hands-on activities, children learn to design, build, and integrate various principles with STEAM components. Hands-on STEAM kits and materials foster a wide range of skills in children, including problem-solving, critical thinking, creativity, and collaboration, by increasing their engagement in the learning process.

**3D pens** are used in both art and engineering subjects. 3D pens enable children to harness their creativity and artistic expression while designing and creating their projects. By using 3D pens,

children also understand the engineering design process, which encourages them to think in three dimensions and construct simple structures in 3D space. Using 3D pens enhances spatial reasoning, problem-solving skills, and creativity.

**Computer Hardware** is used in computer science to help children understand the roles and operating principles of internal computer components. Through interactive learning, children see and touch the inside of the computer hardware and each device, which increases their interest and engagement.

**Logic game tools, puzzles, and math hands-on resources** are employed to make learning math enjoyable. These resources enhance children's understanding of mathematical concepts and improve their computational skills, logical thinking, and problem-solving abilities.

### 2.2.3. Enhancing Problem-solving and Collaboration Skills

**Group projects** encourage children to share their ideas and work together to achieve common goals. Engineering and robotics kits and 3D projects are specifically designed for group activities to foster teamwork, communication, and collaboration skills, and to produce projects as tangible outcomes.

**The iterative problem-solving approach** is used to strengthen fundamental science, engineering, and math skills. This method allows children to experience the process of identifying problems and solving them through multiple iterations. This approach helps children improve their strategic thinking, critical thinking, and logical reasoning abilities.

**Individualized feedback and improvement plans** are also provided. Instructors evaluate students' problem-solving skills and collaborative efforts, identifying areas that may need additional support, such as creative problem-solving and role distribution within the team. This feedback helps individual children address and improve their weaknesses.

## 3. Key Programs and Achievements

### 3.1. School-Based STEAM Program in Partnership with DC Public Schools (DCPS)

#### 3.1.1. STEAM Afterschool Program

In response to the rapid changes in the industrial structure, the government has provided STEAM education to more children nationwide to help them develop future science and technology skills. However, there is a significant disparity in the availability of STEAM education among different socio-economic groups.

DC public schools in underserved communities also face challenges such as a lack of STEAM education resources and curriculum, as well as limited time to teach STEAM within the regular school day. Our organization proposed partnering with DC Public Schools (DCPS) to address these challenges in STEAM education by offering the STEAM program during afterschool hours at no cost to students. We partner with Savoy Elementary School and Turner Elementary School.

The partnership with Savoy Elementary School (ES) has been a particularly resounding success in increasing access to STEAM education in underserved communities. Through this partnership, our organization provides STEAM education content, resources, and highly qualified instructors. Savoy ES supports the program by providing facilities, recruiting students, ensuring their attendance, and assigning two staff members to assist throughout the program.

The involvement of these qualified staff members, along with the designated program time from 3:30 to 4:30 p.m., has been crucial in maintaining full student participation for the entire 50-minute session. This school's active cooperation has contributed to the program's sustainability and built confidence in its long-term success. In turn, our organization has enriched the school's afterschool program by offering valuable STEAM subjects. Through our STEAM education offerings during afterschool hours, we, in collaboration with the school, are actively working together to reduce educational disparities and improve access to STEAM opportunities for all students.

*For a more detailed overview and achievements of our partnership, please refer to "A Case Study: Partnership with DC Public Savoy Elementary School," written by Dr. Lan Joo, Founder and CEO of CHC Institute.*

### **3.1.2. Math Tutoring Program Offered (School Year of 2023-2024)**

To address achievement gaps in math education, we implemented a math tutoring program for students at Malcome X Elementary, a DC public school. This program aimed to enhance core academic math skills among vulnerable children by providing math content, resources, and tutoring support during afterschool hours.

## **3.2. Community-based Program in Partnership with DC Public Libraries (DCPL)**

CHC operates community-based STEAM programs in partnership with the DC Public Libraries (DCPL) central office. This initiative, unlike traditional education, aims to create meaningful change in the community by addressing the education gap and promoting educational equality.

Through this partnership, our organization offers free, high-quality STEAM education to underserved children in grades K-5. The program is delivered at the DCPL Parkland-Turner branch during after-school hours throughout the school year and at the Anacostia branch during summer break. These two libraries are located in Ward 8, an area with a high concentration of low-income residents, making it a community in urgent need of educational support.

As our program is designed to be inclusive and adaptable, it ensures that all children can enjoy the best educational opportunities. These free STEAM learning opportunities help reduce the financial burden of STEAM education, increase access to learning, and work toward eliminating educational inequality.

### **3.2.1. STEAM Afterschool Program**

Through our partnership with the DC Parklands-Turner public library, our organization provides comprehensive STEAM program content, resources, and qualified instructors. In turn, the library offers dedicated staff, including a children's librarian and a children's library space for the program. This collaborative approach ensures full student participation during the 50-minute program. By providing high-quality free STEAM afterschool programs to children in low-income communities, we have increased access to STEAM education in the community and enhanced interest in STEAM skills and knowledge among both children and parents.

*For a more detailed overview and achievements of our partnership, please refer to "A Case Study: Partnership with the Parklands-Turner branch of the DC Public Library," written by Dr. Lan Joo, Founder and CEO of CHC Institute.*

### **3.2.2. STEAM Summer Program**

We offer a summer STEAM program at the DC Anacostia Public library during the summer vacation. This program is more than just an extension of the regular school year; it is an essential part of our commitment to year-round education. The program provides an immersive STEAM educational experience that helps children continue their STEAM learning and deepen their curiosity during summer break. This initiative underscores our organization's dedication to strengthening children's skills in STEAM throughout the year and cultivating their future capabilities.

### **3.3. Special Activities of Field Trips**

Recognizing that STEAM-related activities are often more expensive than general programs, we offer field trips, such as the Children's Museum, to children at no cost. This initiative allows them to gain valuable science experiences without a financial burden. By providing opportunities to see, touch, and explore in a new environment beyond the classroom, these field trips contribute to helping children learn scientific principles in a real-world setting, making abstract concepts more tangible. This hands-on experience is a key part of our program, providing practical learning that goes beyond books or classes. This inclusive approach ensures that all children, regardless of their economic background, can access quality STEM education.

### **3.4. Special Events**

#### **3.4.1. Annual Christmas Gingerbread House Building Event**

Every December, CHC hosts a special Christmas event that creates a precious moment for children and their families to come together and celebrate the holiday season. This event emphasizes family teamwork, fostering joyful memories for both children and their families.

The event features the "Gingerbread House Building" project, where families collaborate to build the best gingerbread house. Through this group activity, children learn to share ideas and work together to achieve a common goal. The gingerbread house building project serves as an ideal opportunity to nurture this spirit of cooperation as children experience the value of teamwork through dividing roles, coordinating opinions, and solving unexpected problems as a group.

The active involvement of parents and family members in this group project makes this event even more special. Parents work alongside their children to build a Gingerbread house, strengthening positive bonds between the program, families, and the community, which is crucial to the program's sustainable growth.

This event goes beyond a simple craft activity; it aims to achieve several significant educational and social goals while encouraging parents' involvement. We are confident that it will provide children with unforgettable joy and a sense of accomplishment through this exceptional experience.

#### **3.4.2. STEAM Program Achievement Awards and Recognition**

At the end of the school year, our program presents awards to individual children and teams that have demonstrated outstanding participation and achievements. We celebrate their efforts and accomplishments, encouraging them to stay motivated as they advance to the next stage.

**Highest Attendance Award: Recognizing the Value of Consistency and Enthusiasm**

This award is given to children who achieve the highest attendance throughout the school year. This award recognizes their consistent effort and enthusiasm for learning, as their attendance rates reflect a strong interest and active engagement in STEAM learning. This award also fosters the development of consistent learning habits among children. This award is particularly significant because we acknowledge that the success of our program depends on the voluntary participation of children.

#### **Instructor Evaluation Highest Score Student Award**

This award is presented to children who achieve the highest scores based on thorough evaluations conducted by instructors. Instructors assess children by observing problem-solving skills, critical thinking, creativity, and collaboration. This award recognizes those who demonstrate significant learning achievements and practical application of STEAM skills they have acquired through the program. This award also encourages children to develop a self-directed learning attitude and take the initiative in solving problems.

#### **Best Team Project Awards: Emphasizing the Importance of Collaboration and Communication**

One of the core educational methodologies of our program is "team-based project activities." Through group projects, children share ideas, collaborate to achieve common goals, and develop practical communication skills. The Best Team Project Award recognizes the value of collaboration and commends those who worked together to produce creative results. This opportunity helps children understand the importance of cooperation and communication, skills that are essential to success in a future society.

### **3.4.3. Participation in STEM Fair**

Our organization was invited to the STEM Fair held at the Center PCS School on March 13, 2025. It was more than just a one-time occurrence; it marked a significant step in our ongoing commitment to promoting STEAM education in underserved communities. The fair, which brought together various STEM institutions, was a meaningful event for the community, and our organization's role was essential.

At the STEM Fair, we operated a booth and had the opportunity to introduce our STEAM programs directly to the children and parents who visited. This direct interaction, combined with the hands-on activities we prepared at the booth, allowed children to experience and learn about STEAM firsthand. Moreover, engaging with parents significantly enhanced their interest and understanding of the STEAM field, making them feel more connected and engaged with our organization's initiatives.

## **3.5. Research and Data Analysis**

Dr. Lan Joo, founder and CEO of CHC Institute, leads in-depth research and data analysis, which are essential components of our program operations. This process enables us to identify successful program outcomes and highlight areas that need improvement, thus effectively demonstrating to all stakeholders how our organization is contributing to closing the STEAM education gap.

#### **Case Studies:**

Dr. Joo published two case studies titled "***A Case Study: Partnership with the Parklands-Turner branch of the DC Public Library***" and "***A Case Study: Partnership with DC Public Savoy Elementary School***." In developing these case studies, Dr. Joo collected and utilized the following three key data points.

- **Attendance data:** Dr. Joo analyzes attendance data collected throughout the school year and uses it as an indicator of the program's appeal and student participation.

- **Participant Survey:** At the end of the school year, Dr. Joo designs and distributes surveys to participants to measure their satisfaction and interest in the program, and to assess their learning outcomes.
- **Instructor Evaluation:** Dr. Joo designs the instructor evaluation form, where instructors observe and assess participants' performance and learning outcomes. This serves as an objective evaluation of participants' STEAM skills, including problem-solving skills and collaboration skills.

Based on the analysis of the data, the case studies demonstrate the overall positive impact of our STEAM programs on enhancing students' knowledge and interest in STEAM subjects, as well as improving their problem-solving and collaboration skills. The findings from these case studies will guide us in improving the program's content, which will be integrated into our future program planning. Furthermore, we aim to raise awareness about our contribution to improving access to and advancing STEAM education by sharing the insights gained from the case studies with other institutions, parents, and the community. The case studies serve as a crucial reference for securing external partnerships and sponsorships.

### 3.6. Achievements and Outcomes

Our programs successfully delivered high-quality STEAM education to children in underserved communities, as evidenced by our research and data findings. The success of our initiatives is evident in the increasing number of students who report satisfaction with the program and choose to participate again, as shown in survey responses. Additionally, we have observed improvements in their STEAM competencies based on evaluation data.

#### **Reduced educational disparities**

Our in-depth data analysis, which includes participant surveys, instructor evaluations, and attendance records, demonstrates our success in improving access to quality STEAM education for children in underserved communities. By providing high-quality STEAM education free of charge to children at schools and public libraries in these communities, we enhance access to STEAM learning and help reduce educational disparities. This achievement is significant and aligns with our organization's vision.

#### **Created demand-driven approaches**

Our goal is to develop a program that is driven by demand and encourages voluntary participation from children. Analysis of the survey data demonstrates that children reported high satisfaction with the program and expressed a strong desire to participate again. Children enjoyed hands-on projects using various interactive STEAM learning kits, which enhanced their learning engagement. The clear indication of a positive and satisfying experience underscores the valuable impact of the program's demand-driven approaches on its long-term sustainability.

#### **Complemented the limitations of STEAM school education**

Public schools in underserved communities often lack the necessary resources and curriculum for STEAM subjects. Additionally, there is limited time available during school hours to adequately teach these subjects, despite school leaders recognizing the urgent need for STEAM education. To address these gaps and complement what is lacking at schools, we provided high-quality STEAM programs after school that are not sufficiently covered during regular school hours.

#### **Increased STEAM competencies via hands-on, team-based project learning**

By using hands-on educational kits and materials, children collaborate in teams to produce various projects. These engaging activities not only increase student interest but also contribute significantly to improving collaboration and problem-solving skills. Our findings confirmed that hands-on, team-based project learning is highly effective in maximizing learning outcomes.

#### **Established the sustainability of the program via a partnership model**

The program's sustainability is achieved through a successful partnership model. Through the strategic partnerships, our organization provides STEAM educational content, learning materials, and expert instructors, while the partner institutions contribute facilities and personnel. In the case of schools, they also recruit students and ensure their attendance. This collaboration with our partner institutions has been a key factor in maintaining consistent student participation, which contributes to the long-term success of the program.

#### **Raised community awareness and parents' interest**

Our program has successfully raised community awareness and increased parents' interest in STEAM education. We have effectively communicated the significance of STEAM education to parents, leading to their active encouragement for their children to participate. These positive outcomes illustrate the ripple effect of the program, which is supported by our data analysis.

## **4. Future Plans: Strengthening Partnerships and Sustainable Growth**

We have learned valuable lessons from our successful collaboration with DCPL and DCPS. Using these insights, we are developing strategies to strengthen our partnerships further and ensure sustainable growth of our program.

### **4.1. Strategies for Strengthening Partnerships**

#### **Establishing strategic partnerships and close communication**

Establishing strategic partnerships with institutions such as DC public libraries and DC public schools is essential to building a solid foundation for our program and securing the necessary support. To identify potential issues early and work collaboratively toward shared goals, we will maintain regular and open communication channels. Participation in external events, such as the STEM Fair, will also be a part of these partnerships, serving as an essential platform for engaging with communities and raising awareness of our organization's vision.

#### **Building an active collaboration model**

We aim to implement an "active" partnership model similar to what is seen at Savoy Elementary School and Parklands-Turner public library, where staff members are directly involved in operating the program. Their involvement ensures the consistent delivery of high-quality STEAM education, which is key to the success of the program.

#### **Leveraging complementary strengths**

Our organization provides STEAM education content, resources, and instructors, while the partners offer safe learning spaces, skilled staff members, and ensure students' attendance. By leveraging each other's strengths, we have enhanced the quality of our programs. We will continue to maximize the synergy of our collaboration by fully utilizing the expertise of each partner.

#### **Defining a clear role and shared vision**

When establishing new partnerships, it is essential to define the roles and responsibilities of each institution clearly. Engaging in in-depth discussions about leveraging each other's strengths and resources will improve mutual understanding. Additionally, setting shared visions and goals—particularly in addressing gaps in STEAM education—and working together to achieve them is vital for the success of our partnerships.

### **4.2. Strategies for Sustainable Growth**

#### **Leveraging insights obtained from data and feedback**

We will systematically collect and analyze data to evaluate learning outcomes and growth throughout the school year. In addition, we will gather feedback from participants, their parents, and instructors.

The insights gained from this data and feedback will highlight our program's strengths and identify areas for improvement, providing essential guidance for the continuous development of our program content. Through these efforts, our organization aims to develop sustainable STEAM programs.

**Promoting a successful partnership model**

We will continue to promote a successful partnership model to achieve sustainable growth in our program. We will document and share our successful case studies to encourage other local institutions to partner with us in our efforts to reduce disparities in STEAM education.

**Maintaining flexible and adaptive program operation**

We will remain flexible in adjusting and adapting the program content to meet the unique characteristics and needs of each participant, school, or institution. We understand that not all children and institutions function the same way, and therefore, a flexible approach is necessary.