ENHANCING AFRICAN NOVA SCOTIAN LEARNERS

SCIENCE, TECHNOLOGY, ENGINEERING & MATHEMATICS (STEM)

DALHOUSIE UNIVERSITY

IMHOTEP'S LEGACY ACADEMY

MESSAGE FROM THE CHAIR OF IMHOTEP'S LEGACY ACADEMY

Dalhousie and other universities in Nova Scotia, face a significant challenge in recruiting African Nova Scotian students into the science, technology, engineering and mathematics fields (STEM). Imhotep's Legacy Academy's outreach into the community is one solution to this challenge.

We focus on motivating junior high and high school students to enter STEM fields through hands-on activities, tutoring and scholarships. This work improves the overall quality of the applicant pool by finding and inspiring the best students to think of STEM as a professional destination.

Over the last sixteen years, Imhotep's Legacy Academy has created a program structure that is successful in delivering results.

Ultimately, Imhotep's Legacy Academy will build a stronger and more diverse community of engineers, scientists and health care professionals.

J. Pemberton Cyrus, PhD, PEng, FEC
President, Imhotep's Legacy Academy
Associate Vice-President Academic, Dalhousie University

ABOUT US

Imhotep's Legacy Academy (ILA) is an effective and successful, province-wide outreach organization, established in 2003. Based at Dalhousie University, ILA is built on a strong university-community partnership. It aims to redress the underrepresentation of African Canadians in postsecondary Science, Technology, Engineering & Mathematics (STEM) studies.

ILA uniquely mobilizes university students, faculty and community leaders to help improve student success and bridge the achievement gap for Grades 6–12 African Nova Scotian (ANS) learners.

ILA provides its participants with an enriching blend of real-world learning projects, skill-building and leadership development activities, as well as tutoring support.

ILA, operating in more than half of Nova Scotia's regional school boards, trains and supports university students to play powerful roles in the lives of its participants through the building of self-confidence, self-discipline and the mastery of concepts related to scientific, technical, engineering, and mathematics fields.

HISTORY

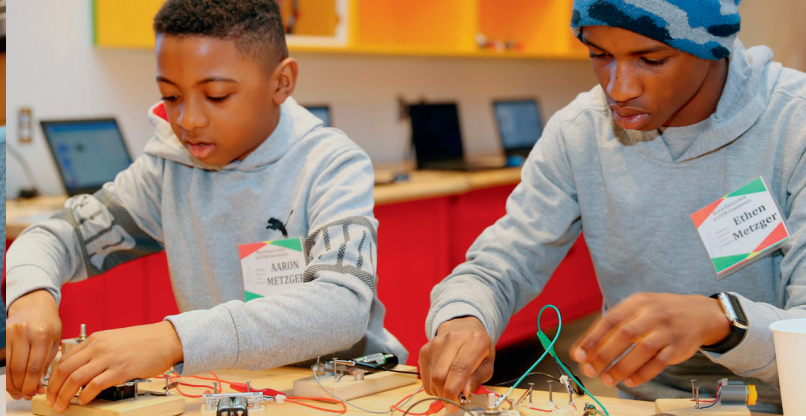
In 1999, a science outreach workshop dubbed "Imhotep's Legacy Project I" was organized in Vancouver by ILA's founder, Dr. Kevin Hewitt, for kindergarten to grade 8 African Canadian students. Dr. Hewitt's experiences led to a discussion with Mr. Wayn Hamilton and the conceptualization of a series of Imhotep's Legacy Projects. Mr. Hamilton identified Ms. Barb Hamilton-Hinch, at the time Dalhousie's Black Student Advisor, who came on board to lend her connections. Years later, with the dedication of many, Imhotep's Legacy Academy operates across Nova Scotia, making STEM subjects accessible and interesting while also supporting academic success.

EXPECTED OUTCOMES

- Involve members of the Dalhousie community, science teachers, African Nova Scotian learners and their parents, in ILA's programs.
- Increase enrolment of African Nova Scotian learners in STEM programs at Dalhousie University and at other post-secondary institutions.

DID YOU KNOW?

Since 2003, Imhotep's Legacy Academy has successfully provided Science, Technology, Engineering & Mathematics (STEM) enrichment programs to over a thousand African Nova Scotian students.



ILA'S PROGRAMS

ILA's **After School Program (ASP)** introduces junior high school students of African descent to curriculum-related science and math activities intended to develop their interest in, and increase awareness of, these subjects. Mentors visit junior high schools on a weekly basis and alternate between math and science activities. These sessions are an opportunity for students to develop an interest in STEM subjects and get extra assistance with their homework. The science activities are hands-on and interactive, using common household items familiar to students. The math activities are tailored to strengthen their skills in mathematics concepts. The university students who act as Mentors are essential to the success of the program. Our Mentors work to develop a relationship with their students and they are also role models, as they themselves are pursuing STEM-related fields in their post-secondary studies.

ILA's **Virtual School Program** (VSP) provides tutoring to students of African descent in grades 9–12 throughout Nova Scotia. ILA Mentors interact with participants online, on-site at the ILA Office (currently located in Dalhousie University's Killam Memorial Library) or at their schools. The program is designed such that every participant has access to a Tutor. In addition to receiving tutoring, VSP participants can participate in workshops and other fun activities that enhance their educational experience and prepare them for post-secondary studies.

ILA's ***FIRST* LEGO League (FLL)** Program is a robotics program designed to get junior high school students of African heritage, aged 9–14, excited about science and technology. It teaches students the value of working together and of solving problems. Each year, ILA's FLL teams can compete in regional and provincial competitions. The challenge for each year has a central theme based on a real-world scientific topic (for example, the theme for 2017/18 was *Hydrodynamics*). Imhotep's Legacy Academy has participated in FLL competitions since 2011, and over the years our teams have received awards for "Presentation", "Mechanical Design", "Technical Design", "Robot Design" "Spirit and Enthusiasm" and "Project Innovative Solution" at the regional and provincial levels. In 2017, our *Legos 'R Us* team qualified as 1 of 20 worldwide teams to compete at the *Global Innovation Award* competition in Washington, DC.

In 2017, ILA partnered with the Black Business Initiative's Business is Jammin' (BIJ) to launch the **RBC iCode+ Program** to teach coding to ANS learners. This program is designed to engage learners with hands-on coding exercises. It introduces students to the use of open-source software and hardware to code robots, thus keeping the program exciting. The program runs for 25 weeks and has 22 learning modules and 3 individual project modules. At the early stage of the program, participants learn the fundamentals of coding, and as the modules advance, the level of coding increases. Participants will learn how

"Having ILA mentors of African Descent made me more confident and proud about my intelligence and helped me realize my potential. What I value the most about ILA's programs is that it helped me grow as a person, strengthened my math, people and leadership skills."
– Jasmin Desmond, Antigonish

to control current, voltage, and resistance using combinations of hardware and code. They will be introduced to 3D CAD drawing and printing, and by the end of the program, they would have built an autonomous robot.

ILA's **Summer Student Research Scholarships** (SSRS) are offered in partnership with Dalhousie

University's Faculty of Science, Engineering, Health, Computer Science and Faculty of Medicine to create research scholarships for African Canadians pursuing an undergraduate degree in science, engineering, or health professions, at any university in Nova Scotia. The scholarships, valued at $6,500 each ($5,000 for Medicine), are tenable at Dalhousie University over the summer months (May–August) to support university students as they conduct specialized research in their chosen field under the guidance of a Dalhousie faculty member whose primary appointment is in one of the sponsoring Faculties. Students will gain valuable experience in the design, execution,and evaluation of experiments.

In partnership with TD Bank, the **ILA-TD Bank Opportunity Scholarships** are four-year renewable scholarships for ILA program graduates entering Dalhousie University. Its purpose is to reduce the financial barrier for African Nova Scotian students pursuing studies in STEM-related fields. The promise award is based on participation in ILA's programs. Each year a student remains active in ILA, an additional amount can be added to their total to a maximum of $5,000 renewable for four years of study at Dalhousie. The table below illustrates the award increments by grade:

GRADE	7–10	11	12
Future four-year renewable award at Dalhousie per year	$500	$1000	$2000

In partnership with the Faculty of Engineering, African Canadian Services Division (ACSD) and ANS community-based summer camps (BrainPower SummerSlide), ILA offers a two-day Summer Rocket activity. Elementary school-aged campers are taught how to build and launch rockets as a means to stimulate their interest in STEM. Also included are presentations on safety and space science.

ILA also has several programs under development, including: Science Quiz Tournament; Science Activity Videos; STEM Project Challenge; and Learning Skills Workshops.

DID YOU KNOW?

By Fall 2019, the ILA-TD Scholarship will have paid out $133,500 in scholarships to 22 deserving students and has promised an additional $357,500 in scholarships to be paid over the next 8 years at Dalhousie University, thanks to TD Bank.

CHALLENGES FACING YOUTH

African Nova Scotians have a long history in Nova Scotia. Over the years, despite adverse conditions, African Nova Scotians have made meaningful contributions to Nova Scotian society and have always endeavoured to improve conditions for succeeding generations. Some young learners of African descent, however, continue to find it challenging to develop into academic achievers in science and math within educational institutions that do not value their heritage, their abilities, or their input. Some other factors include:

- The nature of classroom instruction and interaction.
- Insufficient exposure to science as it relates to the life of the young learner.
- Failure to promote skills fundamental to the development of an appreciation for scientific inquiry.

By focusing on several subject areas in science, and adopting a mentoring scheme, Imhotep's Legacy Academy offers a unique approach to enhancing the quality of math and science education for young learners of African descent.

In order to effect meaningful change, we can't just offer a "drop in a bucket" but, rather, we need to make sustained efforts in a way that works for the people involved.
– Dr. Kevin C. Hewitt, co-founder of ILA, Associate Professor, Department of Physics & Atmospheric Science, and Senate Chair, Dalhousie University

I'm just trying to motivate people to see that life is a work in progress, but that no matter what your experience is, it can always be better. You should always believe that it's going to be better and work towards that.
– Ms. Bai Bintou Kaira, BEng (Chemical)'18, 2017 3M National Student Fellow, 2017 Dalhousie Governors' Awardee, ILA VSP Tutor

MY ILA STORY

Obed Harun is a grade seven student at Rocky Lake Jr. High. He is regularly involved with Imhotep's Legacy Academy programs, including the After-School Program (ASP) and First LEGO League (FLL). He also loves to attend Trivia Night on Fridays at the new ILA Learning Centre. ILA's innovative makerspace has helped him discover opportunities to learn about coding, programming and how to construct and modify the design of a robot. He mentions that ILA's FLL and robotics sessions have opened his eyes to the vast world of robotics.

Obed said *"Imhotep increased my interest in STEM and has helped me learn to ask more questions so I can be successful in science and math. The instructors in the program are there to empower me and support me. By participating in Imhotep my grades in science and math improved and were high this past semester. I met faculty and staff at Dalhousie university that encouraged me and give positive feedback on my public speaking skills. I was also able to meet more people in the African Nova Scotian community outside of my inner circle."*

Obed is an active member in his community at large. He participates in the Pathfinder program, camping and volunteering. He also plays piano and sings in the Mass Sanctuary Choir at Halifax SDA Church, all while earning honors in school. Obed's career goal is to become a university professor; because of Imhotep's Legacy Academy, he feels that dream is not far out of reach.

Monique Wright is a grade 12 student at Prince Andrew High School and has been involved with ILA's tutoring program for three years. She joined ILA seeking support with her high school math and science courses, as other tutoring options were relatively expensive. ILA tutors helped explain course material in a way that worked for Monique, helping her to improve her grades. She now credits ILA for helping her discover a love of math and science and pushing her to use her mind in new ways.

Monique said *"Throughout grade 10-12, I've come to value a lot from ILA, I met some of my close friends through the program and the tutors have helped me so much. The tutors are patient, understanding and try their best to make sure I comprehend the topic I'm having trouble with. Even if I am not scheduled to meet with them, they still try to find a way to assist me. ILA's workshops have helped me build character and I've learned to speak out more. I have increased my knowledge of math and science, especially Chemistry, which is interesting because the existence of life is based on chemical reactions."*

Since joining ILA, Monique has challenged herself in her academic courses, which she needs to attend university and fulfil her career aspirations of becoming a nurse. She has spoken about the importance of financial supports, such as the ILA-TD Opportunity Scholarship, as she says, "many people don't go into post-secondary education because they cannot afford the price of tuition." Monique knows her choice to attend university will be well worth the investment.

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