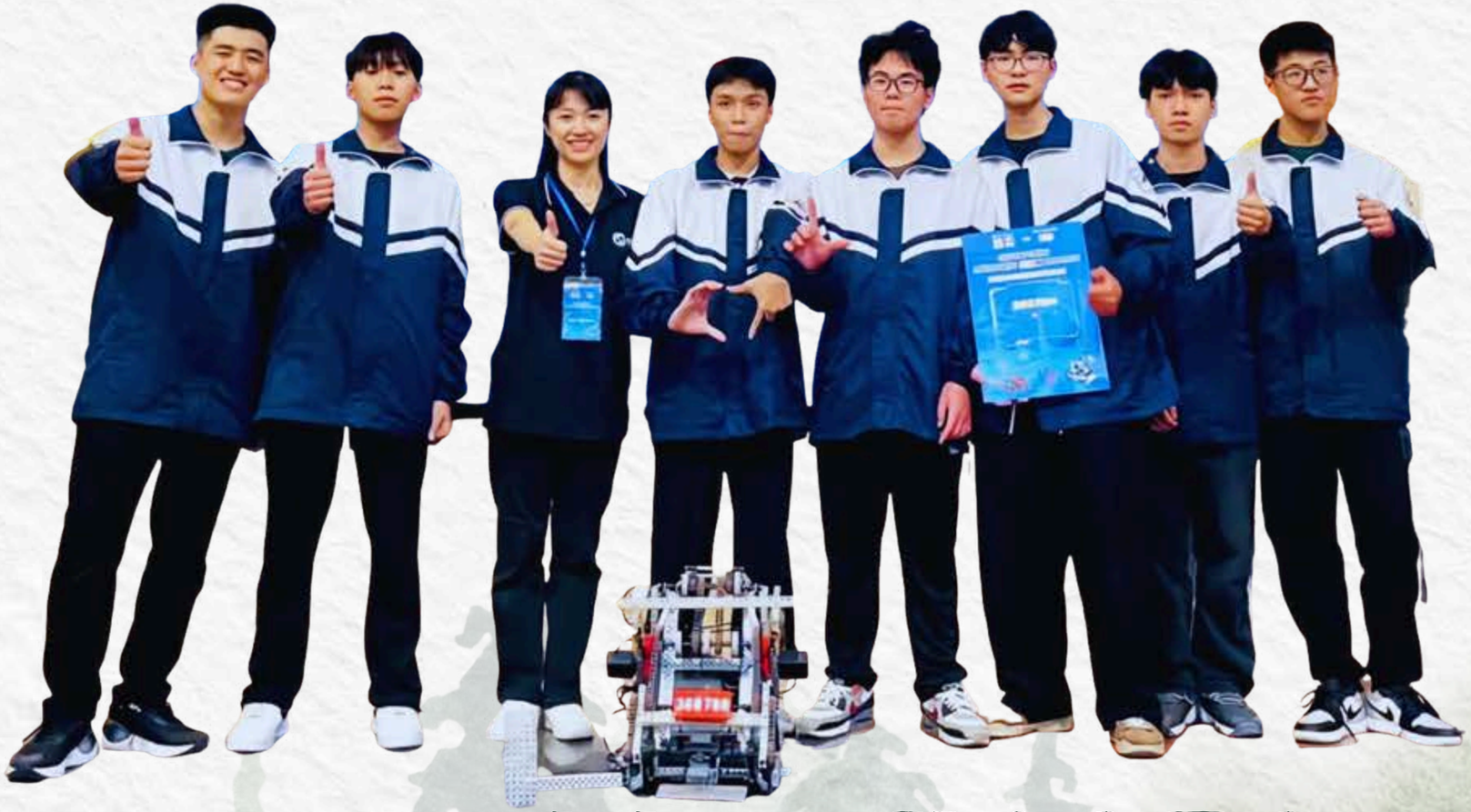


TEAM 11 - 36070M

EMPOWERING CAO BANG THROUGH ROBOTICS EDUCATION

How a robot team from Cao Bang has brought STEM and Robotics education to the entire Cao Bang Province

TEAM 36070M was greeted by the Board of Management of Cao Bang High School for the gifted after earning the Sportsmanship Award at the VEX Robotics Asia Open Signature Event

Our story

From the limestone mountains of a UNESCO Global Geopark - Cao Bang Province to the international robotics stage, our team 36070M's journey shows the hardworking and determined spirit of Vietnam’s northern region. As ethnic Tay students from Cao Bang, a province facing significant educational and economic challenges, we saw an opportunity where others saw obstacles. We’ve transformed them into opportunities for our community empowerment.

Students of Ngu Lao Elementary School during team 36070M's VEX Robotics Inspiration project in 2024

The problem: our province ranks second highest in multidimensional poverty nationwide, and has limited access to modern educational resources. What drives us forward? It's not just wanting to fix these problems, it's the excitement we saw in students' faces when they make a robot move automatically. That look of "Wow, I did it!" or "I have never seen it before!" keeps us going through dangerous mountain paths, conducting more and more projects.

The goal: We want to show the world that limitations aren't walls – they're trampolines. **We are more than just a robotic team but the inspiration of young students in Cao Bang Province and change their minds about the importance of learning and STEM education. Furthermore, we have set a goal to bring attention from organizations to education in remote areas, specifically Cao Bang.**

Our journey

Our journey began in 2023 when we received a VEX V5 kit through support from the **American Center Hanoi**. Through self-directed learning and determination, we've achieved remarkable successes. We got **Excellent Award, Teamwork Champion** and Fullbright University Scholarship in the **National Championship** and qualified to represent Vietnam at the VEX Robotics World Championship 2023-2024. We ranked **49th Worldwide in Skills and 39th out of 82 in the Engineering Division, the highest rank Vietnam has ever achieved**. Before, during and after our VEX Worlds journey, the Chairman of Cao Bang Province and the Department of Education **are always by our side**, they believe that **with the right support**, a robotics team from Cao Bang can achieve remarkable success. Our achievements caught the attention of provincial leaders who offered to **fully fund** the 2023-2024 season robot and trip cost.

MEETING WITH LEADERS

Mr. Hoang Xuan Anh, Chairman of the Provincial People's Committee, presented gifts to encourage Robotics Team 11 [1]

Leaders of the Cao Bang Provincial Department of Education and Training, administrators of Cao Bang Specialized High School welcome Robotics Team 11 at Noi Bai Airport [2]

Mr. Tran Hong Minh, Chairman of the Provincial Party Committee, awarded the Certificate of Recognition from the of the Provincial People's Committee to Robotics Team 36070M [3]

[1]: https://baocaobang.vn/gap-mat-doi-robotics-11-truoc-khi-tham-gia-vex-robotics-quoc-te-2024-3168643.html
[2]: https://giaoducthoidai.vn/hoc-sinh-cao-bang-thang-hang-tai-dau-truong-robotics-lon-nhat-the-gioi-post681481.html
[3]: https://tuyengiaocaobang.vn/index.php/tin-trong-tinh/gap-mat-tuyen-duong-hoc-sinh-giao-vien-dat-thanh-tich-cao-tai-cac-ky-thi-cuoc-thi-cap-quoc-gia-quoc-te-1465.html

Fast forward to the 2024-2025 season, even before the Vietnam National Championship, these are

OUR ACHIEVEMENTS IN COMPETITIONS

We are the Teamwork Champion at the VEX Robotics Scrimmage at Hanoi University of Science and Technology

We got the Sportmanship Award at the VEX Robotics Asia Open Signature Event

We reached the quarterfinal at the VEX Robotics Scrimmage at the Ho Chi Minh city Regional Championship

Applying skills to advance STEM development

After the 2023-2024 season, in addition to fully funding our robotics journey for that season, the Chairman also invited us to **propose STEM development solutions** for the region. This recognition allowed us to implement comprehensive changes using our **acquired skills.**

- **Project Management**: From organizing robotics team to conducting STEM education projects
- **Problem-Solving**: Applying competition strategies to address local educational challenges

Team members speaking to the Chairman of Cao Bang Province

- **Communication**: Leveraging presentation skills from Judge Interviews to engage with school administrators
- **Leadership**: Using tournament alliance coordination experience to build networks of schools and funding organizations
- **Technical Skills**: Applying competition programming knowledge to create localized and personalized STEM lessons and resources

Propose the STEM Developement Plan to the officials

At the meeting, we applied tournament strategy to build plan for community outreach projects:

1. First Step: Public Demonstrations

- Organize Cao Bang's first VEX robotics workshop at Kim Dong Walking Street, Cao Bang City in 30/8/2024
- 300+ participants (students and parents) experienced assembling, controlling and programming VEX IQ and V5 robotics for the first time
- Monthly sessions and social media chat to maintain community engagement

2. Create Remote & Localized Access Solutions

- Create mobile robotics units for mountain schools
- Develop offline & Vietnamese learning materials for areas without internet. After traveling 6km of mountain roads off the main road, we reached 100 Mong ethnic students at Ngu Lao Primary School to implement our offline learning initiative. They are very shy and nervous but quickly got immersed in our robotics lessons, which has demonstrated the impact of developing accessible learning materials for remote areas lacking internet connectivity.
- Establish support networks between urban and rural schools through social media.

3. Educational Infrastructure Development

1. Train 20 teachers and 50 parents at Kindergarten 1/6 to use VEX 123 and change their minds about traditional and modern STEM education.
2. Establish the VEX Go program at Hoa Chung Primary School. To instruct 50 grades 3-5 students and 20 teachers to assemble the VEX Go robot. We discovered that the donated robot kit from the STEM Education and Promotion Alliance was in storage because the teachers didn't know how to use it.
3. Create sustainable robotics programs at Trung Khanh Secondary School, where 100 poor students were taught STEM.
4. Develop maintenance protocols for harsh weather conditions: online classes through Zoom on teachers' phones or pre-recorded video lessons.

Chapter 1: Streets Robotics Project

Detailed Plan:

https://docs.google.com/document/d/1KDXVeZg5a_IHTvjtpkjoqzeRzWyD2bCIt0J6M0Y--tY/edit?usp=sharing

We split the area into 2 Zones for VEX IQ and VEX V5

VEX IQ plan:

Each week, we will cycle through 4 engaging robotics lessons designed to build hands-on skills and problem-solving strategies on a distinct topics. Through coding, building, and competition, students will explore robotics fundamentals while fostering teamwork and creativity.

Detailed plan for VEX IQ zone will be in next pages

VEX V5 plan:

https://docs.google.com/document/d/1_djlxP1v_5vrdQVT_tUZcxuUVLLq1Ps4la9v4UTwbVQ/edit?usp=sharing

Streets Robotics - VEX IQ zone further plan

Students here have had limited access to robotics in the past. Additionally, the instructional materials and resources provided by VEX Robotics are primarily in English. To bridge this gap, we had to **manually translate these documents into Vietnamese; of course, the Vietnamese version of the Lessons was re-translated into English to upload for this PDF Entrance.**

Freeze Challenge Lesson:
https://docs.google.com/document/d/19EsqlLGwa60NcbZTdFqiv9KJF9H52KBf/edit?usp=sharing&ouid=104857901817803303808&rtpof=true&sd=true

Tug of war Challenge Lesson:
https://docs.google.com/document/d/1_fWSwpla7vlj3bxkEmS837W-FrT000Ep/edit?usp=sharing&ouid=104857901817803303808&rtpof=true&sd=true

Up and Over Lesson:
https://docs.google.com/document/d/1R1NfFKkDnm7zBZlenmQXxDPDsRE3okrK/edit?usp=sharing&ouid=104857901817803303808&rtpof=true&sd=true

Treasure Hung Lesson:
https://docs.google.com/document/d/15MVlpjKo3Y2048K-3hPCo7KnzRGy0VFQ/edit?usp=sharing&ouid=104857901817803303808&rtpof=true&sd=true

Streets Robotics - Lesson Material

Besides the lesson plan and pseudocode, we also created video demonstrations of the different mechanisms of robots to aid students in understanding our lessons.

Here are some of our **YouTube videos**:

Testing gear ratio:

https://youtu.be/yf5UY4GlZkA

https://youtu.be/mn7k8wtls7w

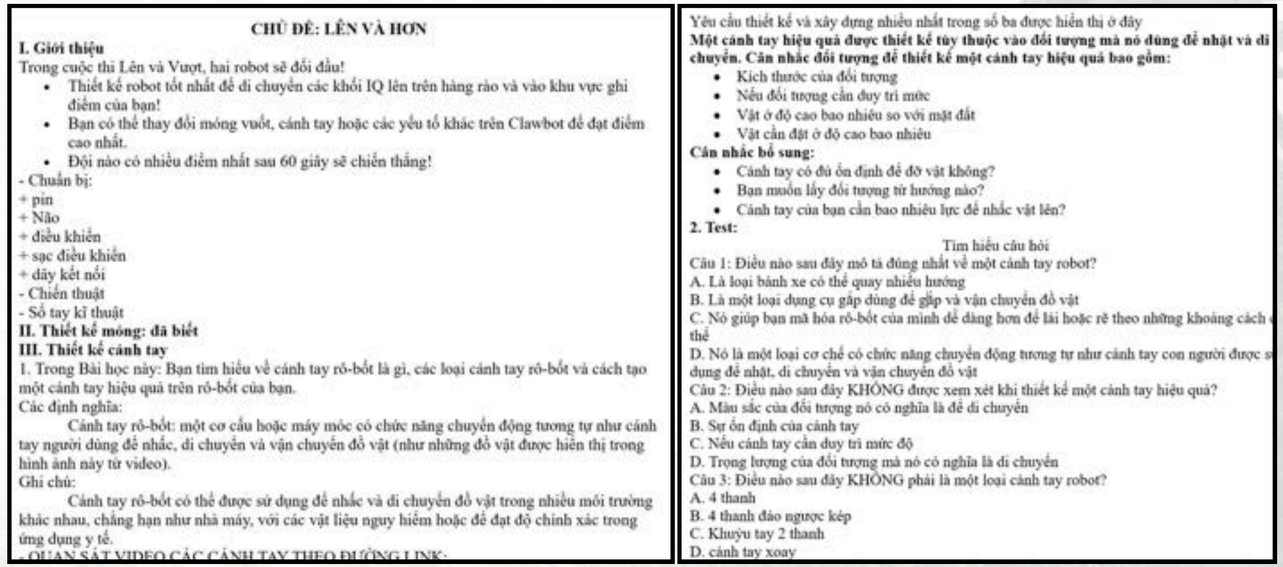
https://youtu.be/VVdlGz9mo70

Robot control path demonstration:

https://youtu.be/M14X2y2TCYs

https://youtu.be/2Ahwcgo4fNc

https://youtu.be/olgg8ZBWlAI



CHỦ ĐỀ: LÊN VÀ HƠN

I. Giới thiệu

Trong cuộc thi Lên và Vượt, hai robot sẽ đối đầu!

- Thiết kế robot tốt nhất để di chuyển các khối IQ lên trên hàng rào và vào khu vực ghi điểm của bạn!
- Bạn có thể thay đổi móng vuốt, cánh tay hoặc các yếu tố khác trên Clawbot để đạt điểm cao nhất.
- Đội nào có nhiều điểm nhất sau 60 giây sẽ chiến thắng!

- Chuẩn bị:
+ pin
+ Não
+ điều khiển
+ sạc điều khiển
+ dây kết nối
- Chiến thuật
- Sổ tay kĩ thuật

II. Thiết kế móng: đã biết

III. Thiết kế cánh tay

1. Trong Bài học này: Bạn tìm hiểu về cánh tay rô-bốt là gì, các loại cánh tay rô-bốt và cách tạo một cánh tay hiệu quả trên rô-bốt của bạn.

Các định nghĩa:

Cánh tay rô-bốt: một cơ cấu hoặc máy móc có chức năng chuyển động tương tự như cánh tay người dùng để nhắc, di chuyển và vận chuyển đồ vật (như những đồ vật được hiển thị trong hình ảnh này từ video).

Ghi chú:

Cánh tay rô-bốt có thể được sử dụng để nhắc và di chuyển đồ vật trong nhiều môi trường khác nhau, chẳng hạn như nhà máy, với các vật liệu nguy hiểm hoặc để đạt độ chính xác trong ứng dụng y tế.

- QUAN SÁT VIDEO CÁC CÁNH TAY THEO ĐƯỜNG LINK-

Yêu cầu thiết kế và xây dựng nhiều nhất trong số ba được hiển thị ở đây

Một cánh tay hiệu quả được thiết kế tùy thuộc vào đối tượng mà nó dùng để nhặt và di chuyển. Cần nhắc đối tượng để thiết kế một cánh tay hiệu quả bao gồm:

- Kích thước của đối tượng
- Nếu đối tượng cần duy trì mức
- Vật ở độ cao bao nhiêu so với mặt đất
- Vật cần đặt ở độ cao bao nhiêu

Cân nhắc bổ sung:

- Cánh tay có đủ ổn định để đỡ vật không?
- Bạn muốn lấy đối tượng từ hướng nào?
- Cánh tay của bạn cần bao nhiêu lực để nhắc vật lên?

2. Test:

Tìm hiểu câu hỏi

Câu 1: Điều nào sau đây mô tả đúng nhất về một cánh tay robot?

A. Là loại bánh xe có thể quay nhiều hướng

B. Là một loại dụng cụ gắp dùng để gắp và vận chuyển đồ vật

C. Nó giúp bạn mã hóa rô-bốt của mình để dàng hơn để lái hoặc rẽ theo những khoảng cách

thể

D. Nó là một loại cơ chế có chức năng chuyển động tương tự như cánh tay con người được s

dụng để nhặt, di chuyển và vận chuyển đồ vật

Câu 2: Điều nào sau đây KHÔNG được xem xét khi thiết kế một cánh tay hiệu quả?

A. Màu sắc của đối tượng nó có nghĩa là để di chuyển

B. Sự ổn định của cánh tay

C. Nếu cánh tay cần duy trì mức độ

D. Trọng lượng của đối tượng mà nó có nghĩa là di chuyển

Câu 3: Điều nào sau đây KHÔNG phải là một loại cánh tay robot?

A. 4 thanh

B. 4 thanh đảo ngược kép

C. Khuỷu tay 2 thanh

D. cánh tay xoay

Part of our lesson script and question in Vietnamese for Ethnic students

Operation - Zone 1 VEX IQ

Students are very interested in driving robots and having competitions and interactions with each other. The most special thing is how excited they are about automation code. They’re amazed that writing code can make robots move, follow commands, and even act “smart” without human controlling. This makes learning about robots fun and helps them understand VEX Robotics better.






Operation

Here are some of our pictures and videos of the Streets Robotics Project - Zone 2 - VEX V5





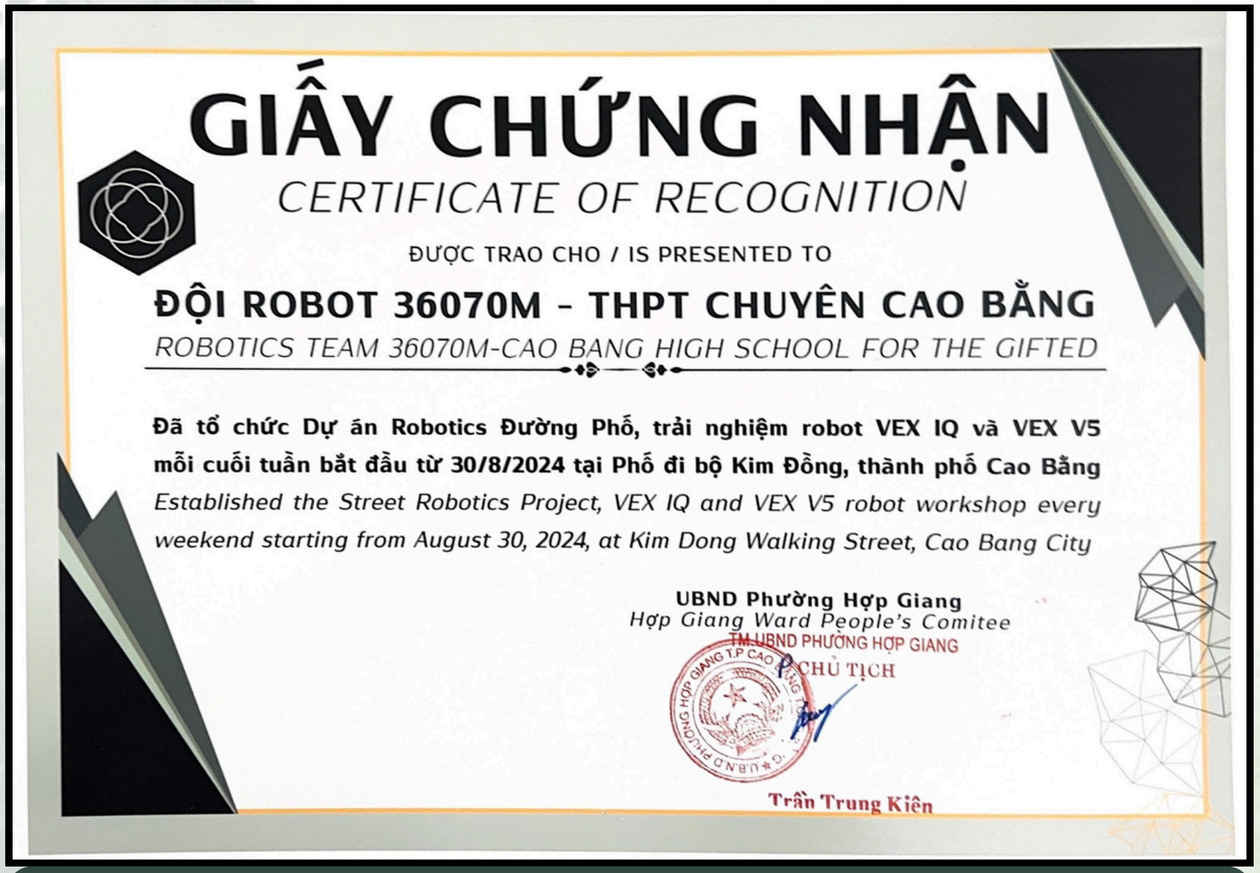





Click to watch in Youtube

Streets Robotics - Result and Recognition from organizations and the government

We have organized 6 events of this Project from August to January, have reached **300+ people in each event**, have **taught robotics, and inspired around 300 students**; we also have **discussed with 100 parents** the importance of STEM education.



GIẤY CHỨNG NHẬN

CERTIFICATE OF RECOGNITION

ĐƯỢC TRAO CHO / IS PRESENTED TO

ĐỘI ROBOT 36070M - THPT CHUYÊN CAO BẰNG

ROBOTICS TEAM 36070M-CAO BANG HIGH SCHOOL FOR THE GIFTED

Đã tổ chức Dự án Robotics Đường Phố, trải nghiệm robot VEX IQ và VEX V5 mỗi cuối tuần bắt đầu từ 30/8/2024 tại Phố đi bộ Kim Đồng, thành phố Cao Bằng

Established the Street Robotics Project, VEX IQ and VEX V5 robot workshop every weekend starting from August 30, 2024, at Kim Dong Walking Street, Cao Bang City

UBND Phường Hợp Giang

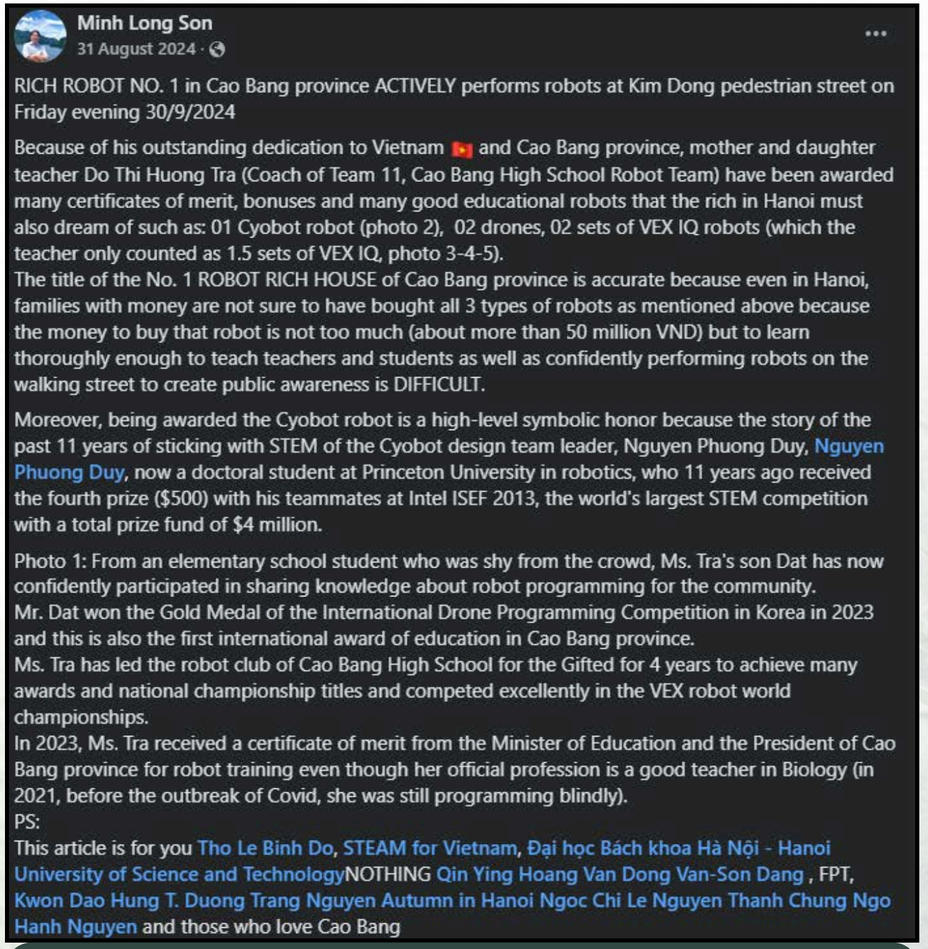
Hợp Giang Ward People's Comitee

TM.UBND PHƯỜNG HỢP GIANG

CHỦ TỊCH

Trần Trung Kiên

Certificate of recognition from the Chairman of Hop Giang Ward



Minh Long Son

31 August 2024 ·

RICH ROBOT NO. 1 in Cao Bang province ACTIVELY performs robots at Kim Dong pedestrian street on Friday evening 30/9/2024

Because of his outstanding dedication to Vietnam and Cao Bang province, mother and daughter teacher Do Thi Huong Tra (Coach of Team 11, Cao Bang High School Robot Team) have been awarded many certificates of merit, bonuses and many good educational robots that the rich in Hanoi must also dream of such as: 01 Cyobot robot (photo 2), 02 drones, 02 sets of VEX IQ robots (which the teacher only counted as 1.5 sets of VEX IQ, photo 3-4-5).
The title of the No. 1 ROBOT RICH HOUSE of Cao Bang province is accurate because even in Hanoi, families with money are not sure to have bought all 3 types of robots as mentioned above because the money to buy that robot is not too much (about more than 50 million VND) but to learn thoroughly enough to teach teachers and students as well as confidently performing robots on the walking street to create public awareness is DIFFICULT.

Moreover, being awarded the Cyobot robot is a high-level symbolic honor because the story of the past 11 years of sticking with STEM of the Cyobot design team leader, Nguyen Phuong Duy, Nguyen Phuong Duy, now a doctoral student at Princeton University in robotics, who 11 years ago received the fourth prize ($500) with his teammates at Intel ISEF 2013, the world's largest STEM competition with a total prize fund of $4 million.

Photo 1: From an elementary school student who was shy from the crowd, Ms. Tra's son Dat has now confidently participated in sharing knowledge about robot programming for the community.
Mr. Dat won the Gold Medal of the International Drone Programming Competition in Korea in 2023 and this is also the first international award of education in Cao Bang province.
Ms. Tra has led the robot club of Cao Bang High School for the Gifted for 4 years to achieve many awards and national championship titles and competed excellently in the VEX robot world championships.
In 2023, Ms. Tra received a certificate of merit from the Minister of Education and the President of Cao Bang province for robot training even though her official profession is a good teacher in Biology (in 2021, before the outbreak of Covid, she was still programming blindly).
PS:
This article is for you Tho Le Binh Do, STEAM for Vietnam, Đại học Bách khoa Hà Nội - Hanoi University of Science and TechnologyNOTHING Qin Ying Hoang Van Dong Van-Son Dang , FPT, Kwon Dao Hung T. Duong Trang Nguyen Autumn in Hanoi Ngoc Chi Le Nguyen Thanh Chung Ngo Hanh Nguyen and those who love Cao Bang

Recognition from the Senior Advisor - Project Executive Board of STEM Education Promotion Alliance

100 ethnic Mong students of Ngu Lao Elementary School during our project

Chapter 2: STEM to the remote area

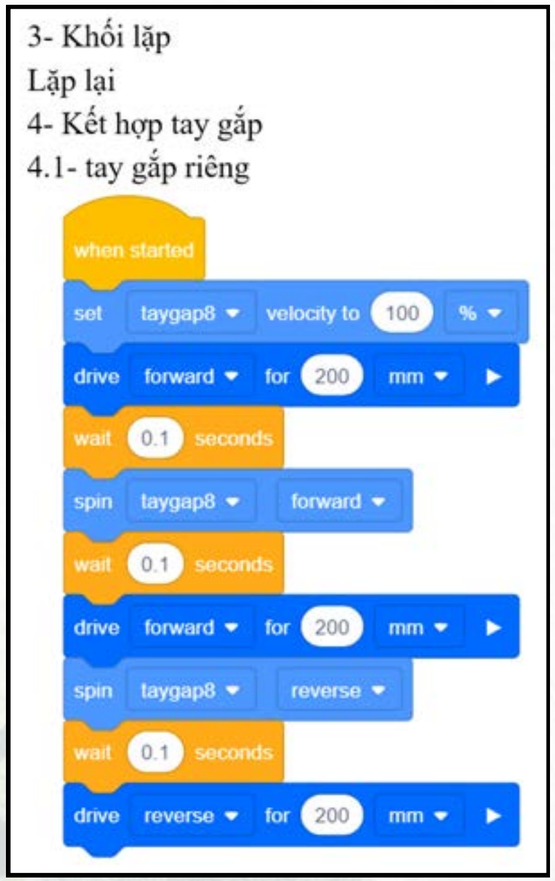
Inspire students at Ngu Lao Elementary School

Information:

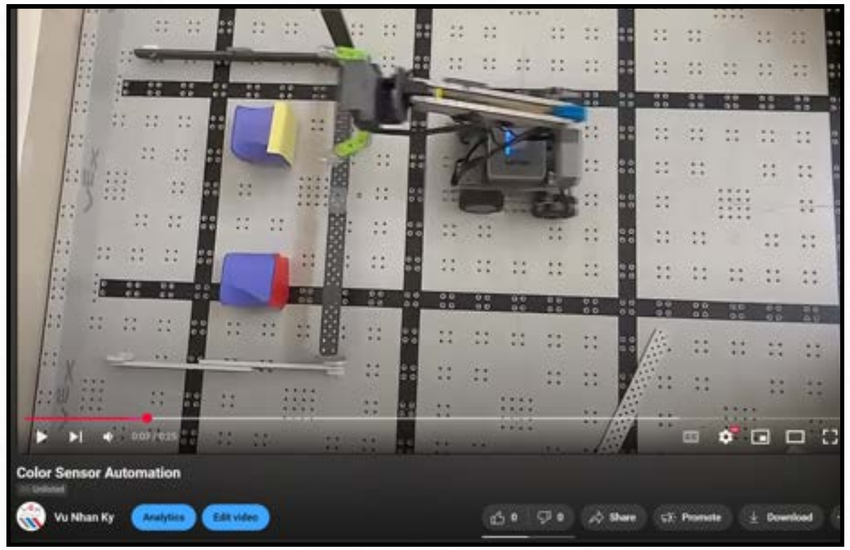
The school is in a remote mountainous area, with 100 ethnic Mong students. Accessing the school is very challenging – 6km off the main road on mountain tracks with a 2km walk. The students don't have prior to robotics or modern technology. So, the activities need to be engaging and simple enough for beginners but still showcase the magic of robotics to spark curiosity and joy.

Detailed plan:

https://docs.google.com/document/d/1cJ4lYyR60BMM84DfK9GAlVbDRaDrK9KwHi8MTB0r1Bg/edit?usp=sharing



The variable of the code blocks have to be in Vietnamse along with the guide



For some of our guide videos posted on Youtube, of course, we will send them offline copies due to **lack of Internet access**

Chapter 2: STEM to the remote area

Building resources to better suit ethnic students

The ethnic Mong students from the school speak the **Hmông** language, which is a bit different from Vietnamese, but they still have some knowledge of Vietnamese. Either way, we tried to make the learning resource as easy to understand as possible, and in Vietnamese so that at least the teachers would be able to translate to students.

We prioritized VEX IQ Code blocks and pseudocode and demonstration videos

Chapter 2: STEM to the remote area

Operation: Teach VEX IQ and let students experience driving robots

We love seeing the joy on the ethnic students' faces when they see robots, especially the VEX V5, because it is so loud, cool, and fast. They are also fascinated when they get to code the VEX IQ robot. Some students say that it has inspired them. They love to go to school, they hope to see us again, and they love to study.

Ngu Lao Elementary School - a heartbreaking scene of students running out to prepare for our lessons


Ngu Lao Elementary School - road to school

Click the images to watch in Youtube

Chapter 2: STEM to the remote area
More engaging images during our Project

Celebration and Recognition

Ngu Lao Elementary School - students celebrating with 36070M team members
Watch on Youtube

Certification of Recognition from the School Administrators of Ngu Lao Elementary School

Chapter 3: Education Infrastructure Development.

We contacted as many schools in Cao Bang Province as possible to offer to teach VEX IQ or VEX V5. Believing in our vision, the STEM Education Promotion Alliance has gifted many schools with VEX Robotics kits like VEX IQ, VEX Go, and VEX 123. However, there is a problem: teachers are not proficient in English and have no experience in modern STEM education solutions like this. Combining our own VEX IQ and VEX V5 robot resource with VEX 123 resource: https://kb.vex.com/hc/vi/articles/585243279643 6-B%E1%BA%AFt-%C4%91%E1%BA%A7u-v%E1%BB%9Bi-VEX-123 and VEX Go lessons from VEX Library translated to Vietnamese.

We went to 3 additional schools: Trung Khanh Junior High School, 1-6 Kindergarten, and Hoa Chung Elementary School.

Our YouTube playlist of VEX IQ lessons at some schools

Chapter 3: 1st of June Kindergarten

We had an unforgettable memory at 1-6 Kindergarten, during our project, we met Nguyen Van Dinh, teachers shared that they are struggling to keep Dinh to go to school, he would constantly try to sneak out of class and play outside. When our members sit down and talk calmly with him, he said that “Why do I have to go to school, my dad didn’t even know any Vietnamese word!!”

Our team member teach Nguyen Van Dinh about the VEX 123 robot at 1-6 Kindergarten

Then we let him try the VEX 123 kit, let him drive and code the robot to drive around toy trees, and let him see the magic of robotics. Slowly but firmly, we saw a spark in Dinh’s eyes, he loves robotics, he love to learn, and he has found a reason to go to school to learn. From that moment, we became more dedicated to inspire and change students’ mind about learning and STEM education.

Us at 1st of June Kindergarten

[Facebook post of 1-6 Kindergarten]

Result and Celebration

After our Inspiration and Education project, the School Administrators of 1-6 Kindergarten decided to **buy 4 VEX 123 robot kit for 4 robot teams**.

With our help, along with the **Department of Education and Training of Cao Bang city**, the 1-6 Kindergarten also **held a Competitions for young students** to code and create unique robot

The celebration of the Code and Create Competition

GIẤY CHỨNG NHẬN

CERTIFICATE OF RECOGNITION

Tên đội / Team name: **11**
Mã đội / Team number: **36070M**
Trường / School: **THPT Chuyên Cao Bằng**
Cao Bang High School for the Gifted

Đã tổ chức Dự án Giáo dục STEM và Robotics VEX 123 tại Trường Mầm non 1-6, thành phố Cao Bằng, tỉnh Cao Bằng vào ngày 18/12/2024
Has organized the STEM and VEX 123 Robotics Education Project at 1-6 Kindergarten, Cao Bang City, Cao Bang Province, on December 18, 2024.

Ban Giám hiệu Trường mầm non 1-6
School Administrators of 1-6 Kindergarten

Certificate of Recognition from Administrators of 1-6 Kindergarten

Chapter 3: Hoa Chung elementary school.

We borrow 1 VEX Go kit from SEPA and bring to teach elementary school students
One special thing now is the teacher from this school tell us that students want to learn coding, some of them want to be game developer and they want to find out about more field to apply coding in.
We also know that students love VEX V5 robot because of its speed loudness and weight so we bring them to run on the ground at the elementary school to gain more attention from students not much interested in coding.

Students at Hoa Chung school enjoy coding the robot

Us at Hoa Chung Elementary School






The Youtube video playlist of us at Hoa Chung elementary school

Celebration and Recognition

Hoa Chung students chanting “VEX VEX VEX” after our Project
Youtube Link

GIẤY CHỨNG NHẬN

CERTIFICATE OF RECOGNITION

Đội robot 36070M THPT Chuyên Cao Bằng

Robot team 36070M of Cao Bang High Shcool for the Gifted

Đã triển khai chương trình phổ cập STEM và Robotics VEX GO cho giáo viên và học sinh trường tiểu học Hoà Chung, thành phố Cao Bằng, tỉnh Cao Bằng

Successfully conducted the STEM and VEX GO Robotics outreach program for teachers and students of Hoa Chung Elementary School, Cao Bang City, Cao Bang Province.

BAN GIÁM HIỆU TRƯỜNG TIỂU HỌC HOÀ CHUNG

THE BOARD OF MANAGEMENT OF HOA CHUNG ELEMENTARY SCHOOL

HIỆU TRƯỞNG

TRƯỜNG TIỂU HỌC HÒA CHUNG

Nông Thị Phương Tuyết

Certificate of Recognition from Administrators of Hoa Chung Elementary School

Chapter 3: Trung Khanh Junior High School

We brought VEX IQ with the same Curriculum as as we planned before. This is a junior high school so students are a older and have more knowledge so we decided to divide the team divide the score into two teams and let them compete with each other. In addition any student can come, drive and experience the VEX IQ robot. They also get a chance to try this year game Rapid Relay.

The post about this event on the school's page

STEM day at Trung Khanh Junior Highschool

Result and Recognition

After the event, the School Administrators **bought 2 VEX IQ Competition Kits and formed 2 VEX IQ Middle School teams.**

GIẤY CHỨNG NHẬN

Certificate of Recognition

Được trao cho / Is given to

Đội robot VEX V5 11 - 36070M

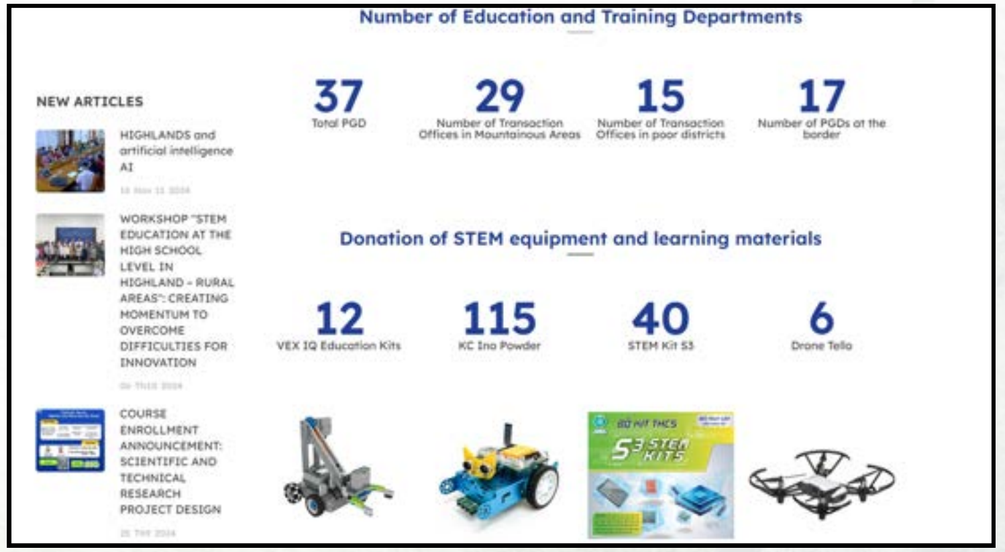
Đã tổ chức Ngày hội STEM trải nghiệm và học về Robot VEX IQ cho học sinh trường THCS thị trấn Trùng Khánh, huyện Trùng Khánh, tỉnh Cao Bằng

Successfully conducted STEM Day, experience and learn VEX IQ for students of Trung Khanh Junior High School, Trung Khanh District, Cao Bang Province.

Trường THCS Thị trấn Trùng Khánh
Trung Khanh Junior High School

Certificate of Recognition from Administrators of Trung Khanh Junior High School

We are incredibly proud that, on the one hand, the Chairman of the People's Committee of Cao Bang Province fully funded our three competition trips. On the other hand, in all of our STEM and Robotics Education Projects at different schools, the VEX Robot kits are also fully funded by the STEM Education Promotion Alliance (SEPA), which believes in our vision and mission.



SEPA website: https://sepa.org.vn/

Reflections

Gia Vỹ, captain of the team

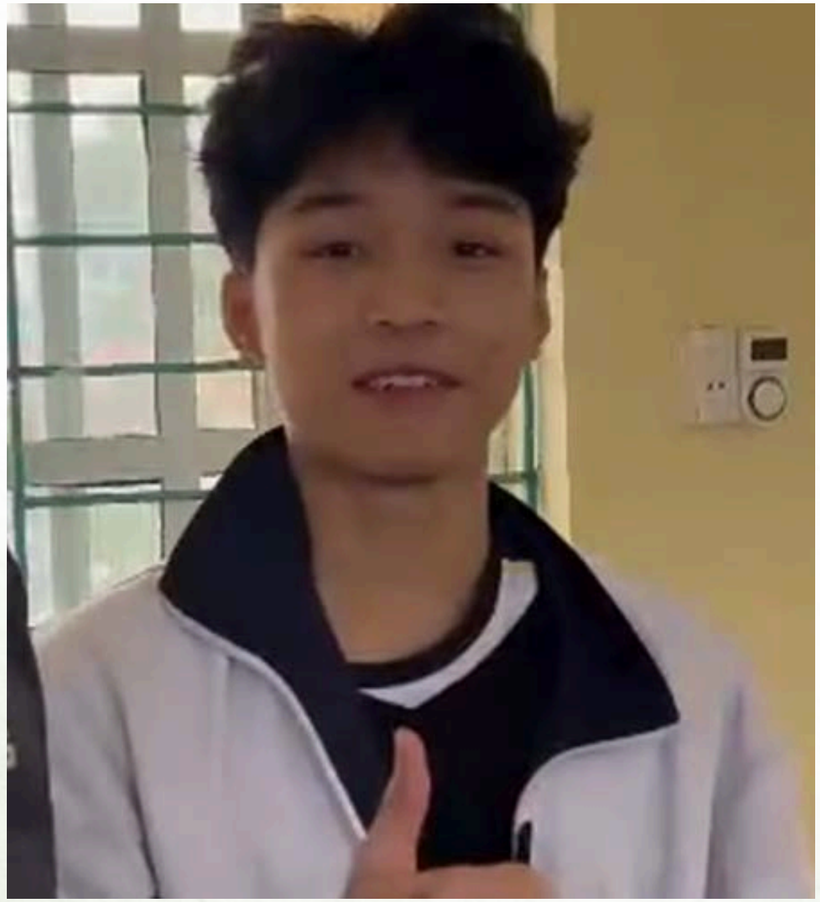
Cao Bằng is a mountainous province where students passionate about robotics have limited access to them. Community robotics classes provide valuable opportunities for students to experience robots firsthand.

In these classes, students learn how to build robots–understanding their components, how they are assembled, and how each mechanism functions. They also get hands-on experience controlling robots using remote controllers and gain insight into programming them with tools like VEXcode V5, learning how different commands define the robot's actions.

These experiences are invaluable, inspiring students to explore new knowledge and fostering a spirit of learning and innovation in Cao Bằng. Moreover, community robotics classes highlight that both Cao Bằng and Vietnam as a whole are continuously seeking advancements to keep pace with global trends in robotics.

For us, it is an honor and a source of pride to serve as instructors in these classes. Guiding students step by step into the world of robotics and witnessing their enthusiasm and curiosity is truly our greatest joy.

Reflections



Khánh Hưng, driver of the team

As a robotics enthusiast and a representative of Cao Bằng in national and international competitions, I recognize the importance of expanding robotics education, especially through our VEX Robotics project.

Robotics is more than programming and assembly–it fosters logical thinking, problem-solving, and teamwork. Seeing how advanced countries integrate robotics into STEM education highlights its value in hands-on learning.

Our team has introduced VEX Robotics at schools and public spaces across Cao Bằng, helping students engage with robotics. To support early access, we donated a VEX GO kit to Ngũ Lão Elementary School, inspiring young learners to explore technology with excitement and curiosity.

Reflections

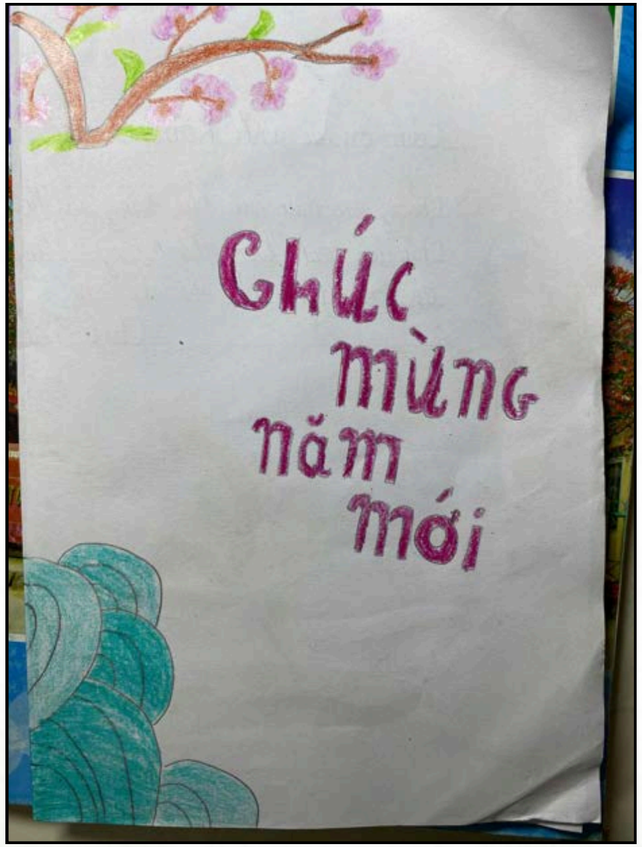
Vũ Tuấn Dũng, builder of the team:
The journey of spreading VEX Robotics through Empower Cao Bang Through Robotics Education is not just about sharing knowledge but also an opportunity to connect and grow the community. This event helps teams, whether new or experienced, learn together and advance.
One of the most precious moments was supporting young teams like 79491A from. The students gained access to new knowledge, and their eagerness to learn inspired us, fueling creativity and mutual progress.
technical and coding programs, members learned teamwork, communication, and idea exchange–essential skills in any field.
More than an event, Empower Cao Bang Through Robotics Education has fostered a stronger generation of robotics enthusiasts, inspiring future generations. It is not just a gathering but a space for teams to connect, collaborate, and grow together.
I am proud to contribute to this development. Empower Cao Bang Through Robotics Education serves as a launchpad for new talents, spreading the spirit of robotics to even more people.

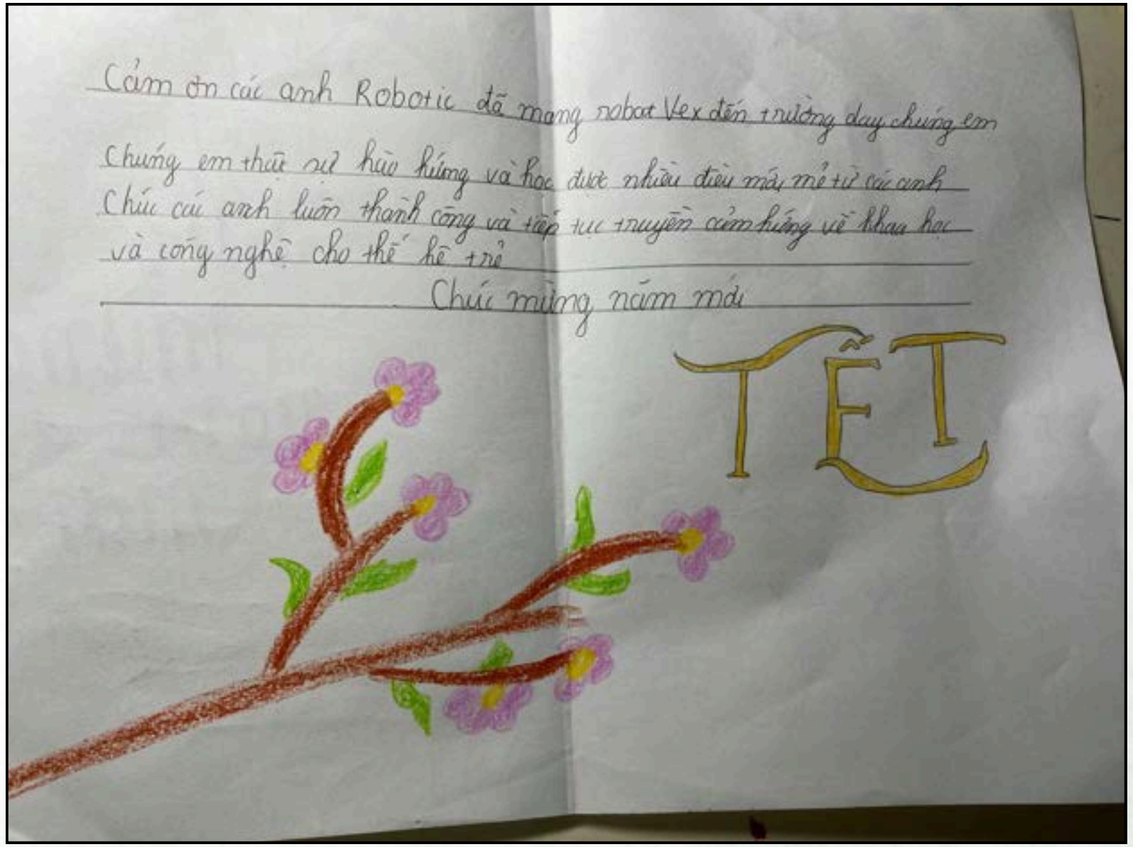
STEM Role Model

Cao Bang High School for the Gifted STEM Role Model is
Ms. Đỗ Thị Hương Trà

Ms. Trà is not only a dedicated robotics mentor but a visionary who has independently cultivated a thriving robotics program from the ground up. Through relentless effort, she has single-handedly established and nurtured a formidable robotics team, fostering both technical excellence and a culture of mutual support. Ms. Trà's approach emphasizes self-reliance and resourcefulness–she guides students to seek solutions collaboratively before turning to her, instilling confidence and critical thinking. Her ability to rally students, secure resources, and mentor teams without institutional backing underscores her exceptional leadership. Under her guidance, the team has grown into a cohesive unit where students learn not just coding and engineering, but also the value of perseverance and teamwork. Ms. Trà's hands-on yet empowering style ensures that students take ownership of their projects, mirroring real-world challenges. Beyond technical skills, she prioritizes communication and adaptability, preparing her team to excel in competitions and beyond.

Thank you letter from students





OVERALL RESULT OF OUR PROJECT SO FAR

Trung Khanh Junior High School:
150 students
Bought 2 VEX IQ Competition Kits
Formed 2 Middle School teams
Held the VEX IQ Rapid Relay Vietnam Tournament: Viet Bac Region

1-6 Kindergarten:
bought 4 VEX 123 kits
50 students
30 teachers
50 parents

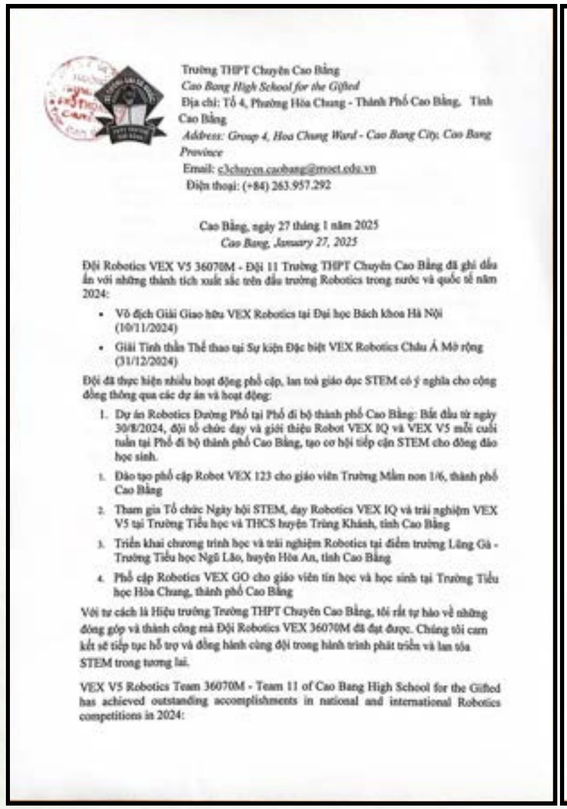
Hoa Chung Elementary School:
bought 2 VEX GO kits
30 teachers
200 students

Cao Bang Walking Street:
300+ students
100+ parents

Ngu Lao Elementary School:
100 ethnic students
10 teachers

We have inspired 700+ students, 70 teachers, 150 parents, help to form 2 VEX IQ teams, and persuaded Trung Khanh School to hold the first Regional Championship in the Northen Region of Viet Nam.

Certifications of Recognition



Trường THPT Chuyên Cao Bằng
Cao Bang High School for the Gifted
Địa chỉ: Tổ 4, Phường Hòa Chung - Thành Phố Cao Bằng, Tỉnh Cao Bằng
Address: Group 4, Hoa Chung Ward - Cao Bang City, Cao Bang Province
Email: c3chuyen.caobang@moet.edu.vn
Điện thoại: (+84) 263.957.292

Cao Bằng, ngày 27 tháng 1 năm 2025
Cao Bang, January 27, 2025

Đội Robotics VEX V5 36070M - Đội 11 Trường THPT Chuyên Cao Bằng đã ghi dấu ấn với những thành tích xuất sắc trên đấu trường Robotics trong nước và quốc tế năm 2024:

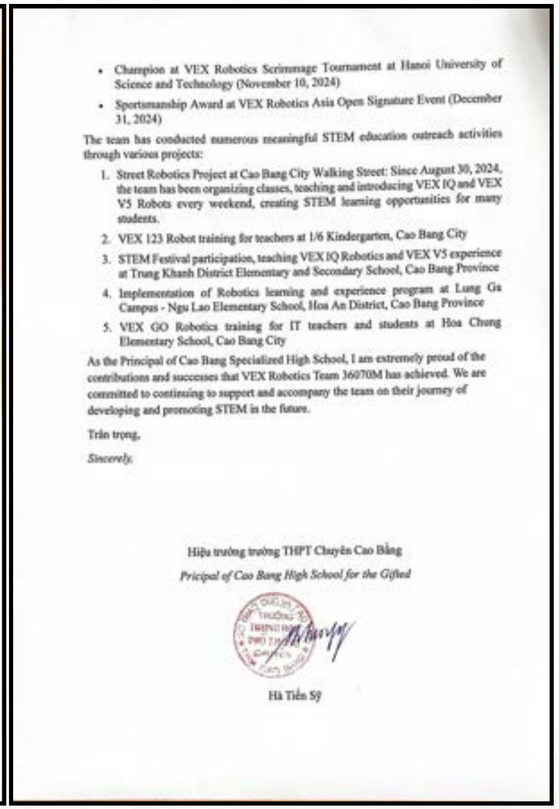
- Vô địch Giải Giao hữu VEX Robotics tại Đại học Bách khoa Hà Nội (10/11/2024)
- Giải Tinh thần Thể thao tại Sự kiện Đặc biệt VEX Robotics Châu Á Mở rộng (31/12/2024)

Đội đã thực hiện nhiều hoạt động phổ cập, lan toả giáo dục STEM có ý nghĩa cho cộng đồng thông qua các dự án và hoạt động:

1. Dự án Robotics Đường Phố tại Phố đi bộ thành phố Cao Bằng: Bắt đầu từ ngày 30/8/2024, đội tổ chức dạy và giới thiệu Robot VEX IQ và VEX V5 mỗi cuối tuần tại Phố đi bộ thành phố Cao Bằng, tạo cơ hội tiếp cận STEM cho đông đảo học sinh.
1. Đào tạo phổ cập Robot VEX 123 cho giáo viên Trường Mầm non 1/6, thành phố Cao Bằng
2. Tham gia Tổ chức Ngày hội STEM, dạy Robotics VEX IQ và trải nghiệm VEX V5 tại Trường Tiểu học và THCS huyện Trùng Khánh, tỉnh Cao Bằng
3. Triển khai chương trình học và trải nghiệm Robotics tại điểm trường Lũng Gà - Trường Tiểu học Ngũ Lão, huyện Hòa An, tỉnh Cao Bằng
4. Phổ cập Robotics VEX GO cho giáo viên tin học và học sinh tại Trường Tiểu học Hòa Chung, thành phố Cao Bằng

Với tư cách là Hiệu trưởng Trường THPT Chuyên Cao Bằng, tôi rất tự hào về những đóng góp và thành công mà Đội Robotics VEX 36070M đã đạt được. Chúng tôi cam kết sẽ tiếp tục hỗ trợ và đồng hành cùng đội trong hành trình phát triển và lan tỏa STEM trong tương lai.

VEX V5 Robotics Team 36070M - Team 11 of Cao Bang High School for the Gifted has achieved outstanding accomplishments in national and international Robotics competitions in 2024:



- Champion at VEX Robotics Scrimmage Tournament at Hanoi University of Science and Technology (November 10, 2024)
- Sportsmanship Award at VEX Robotics Asia Open Signature Event (December 31, 2024)

The team has conducted numerous meaningful STEM education outreach activities through various projects:

1. Street Robotics Project at Cao Bang City Walking Street: Since August 30, 2024, the team has been organizing classes, teaching and introducing VEX IQ and VEX V5 Robots every weekend, creating STEM learning opportunities for many students.
2. VEX 123 Robot training for teachers at 1/6 Kindergarten, Cao Bang City
3. STEM Festival participation, teaching VEX IQ Robotics and VEX V5 experience at Trung Khanh District Elementary and Secondary School, Cao Bang Province
4. Implementation of Robotics learning and experience program at Lung Ga Campus - Ngu Lao Elementary School, Hoa An District, Cao Bang Province
5. VEX GO Robotics training for IT teachers and students at Hoa Chung Elementary School, Cao Bang City

As the Principal of Cao Bang Specialized High School, I am extremely proud of the contributions and successes that VEX Robotics Team 36070M has achieved. We are committed to continuing to support and accompany the team on their journey of developing and promoting STEM in the future.

Trân trọng,

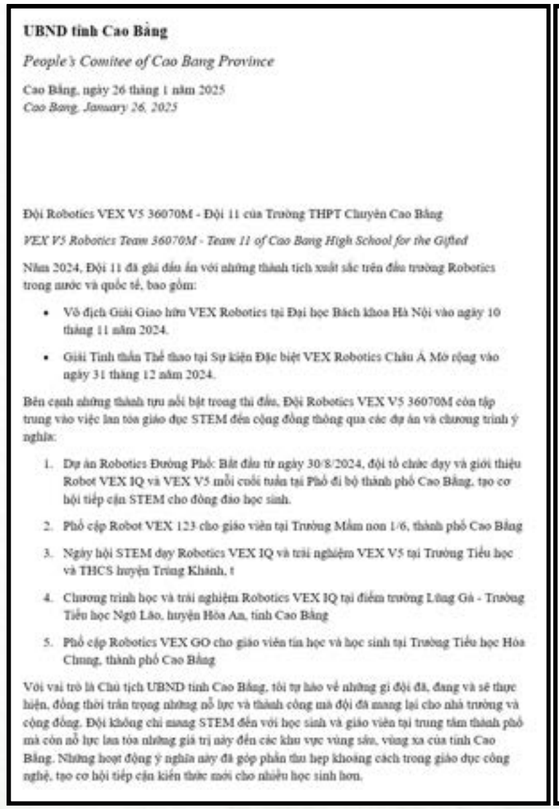
Sincerely,

Hiệu trưởng trường THPT Chuyên Cao Bằng

Pricipal of Cao Bang High School for the Gifted

Hà Tiến Sỹ

Certificate of Recognition from our school's Principal



UBND tỉnh Cao Bằng

People's Comitee of Cao Bang Province

Cao Bằng, ngày 26 tháng 1 năm 2025
Cao Bang, January 26, 2025

Đội Robotics VEX V5 36070M - Đội 11 của Trường THPT Chuyên Cao Bằng

VEX V5 Robotics Team 36070M - Team 11 of Cao Bang High School for the Gifted

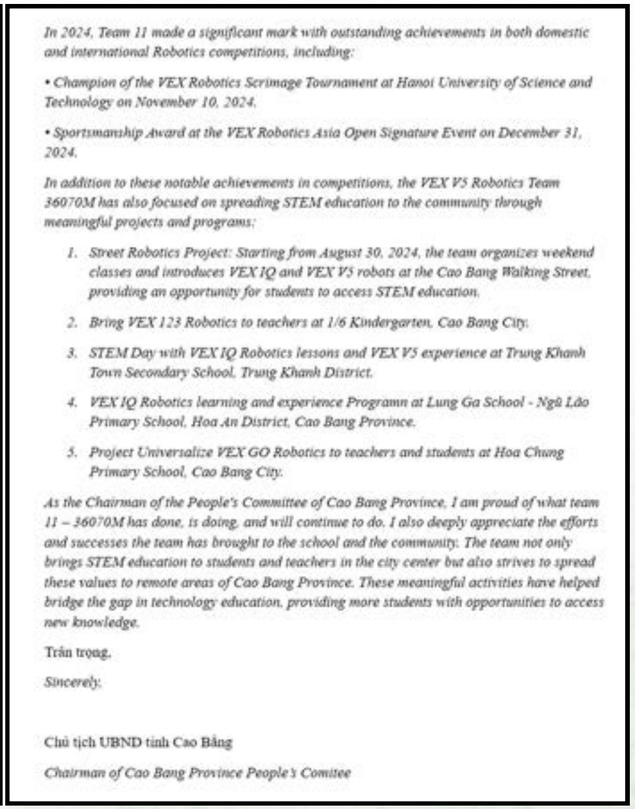
Năm 2024, Đội 11 đã ghi dấu ấn với những thành tích xuất sắc trên đấu trường Robotics trong nước và quốc tế, bao gồm:

- Vô địch Giải Giao hữu VEX Robotics tại Đại học Bách khoa Hà Nội vào ngày 10 tháng 11 năm 2024.
- Giải Tinh thần Thể thao tại Sự kiện Đặc biệt VEX Robotics Châu Á Mở rộng vào ngày 31 tháng 12 năm 2024.

Bên cạnh những thành tựu nổi bật trong thi đấu, Đội Robotics VEX V5 36070M còn tập trung vào việc lan tỏa giáo dục STEM đến cộng đồng thông qua các dự án và chương trình ý nghĩa:

1. Dự án Robotics Đường Phố: Bắt đầu từ ngày 30/8/2024, đội tổ chức dạy và giới thiệu Robot VEX IQ và VEX V5 mỗi cuối tuần tại Phố đi bộ thành phố Cao Bằng, tạo cơ hội tiếp cận STEM cho đông đảo học sinh.
2. Phổ cập Robot VEX 123 cho giáo viên tại Trường Mầm non 1/6, thành phố Cao Bằng
3. Ngày hội STEM dạy Robotics VEX IQ và trải nghiệm VEX V5 tại Trường Tiểu học và THCS huyện Trùng Khánh, t
4. Chương trình học và trải nghiệm Robotics VEX IQ tại điểm trường Lũng Gà - Trường Tiểu học Ngũ Lão, huyện Hòa An, tỉnh Cao Bằng
5. Phổ cập Robotics VEX GO cho giáo viên tin học và học sinh tại Trường Tiểu học Hòa Chung, thành phố Cao Bằng

Với vai trò là Chủ tịch UBND tỉnh Cao Bằng, tôi tự hào về những gì đội đã, đang và sẽ thực hiện, đồng thời trân trọng những nỗ lực và thành công mà đội đã mang lại cho nhà trường và cộng đồng. Đội không chỉ mang STEM đến với học sinh và giáo viên tại trung tâm thành phố mà còn nỗ lực lan tỏa những giá trị này đến các khu vực vùng sâu, vùng xa của tỉnh Cao Bằng. Những hoạt động ý nghĩa này đã góp phần thu hẹp khoảng cách trong giáo dục công nghệ, tạo cơ hội tiếp cận kiến thức mới cho nhiều học sinh hơn.



In 2024, Team 11 made a significant mark with outstanding achievements in both domestic and international Robotics competitions, including:

• Champion of the VEX Robotics Scrimage Tournament at Hanoi University of Science and Technology on November 10, 2024.

• Sportsmanship Award at the VEX Robotics Asia Open Signature Event on December 31, 2024.

In addition to these notable achievements in competitions, the VEX V5 Robotics Team 36070M has also focused on spreading STEM education to the community through meaningful projects and programs:

1. *Street Robotics Project: Starting from August 30, 2024, the team organizes weekend classes and introduces VEX IQ and VEX V5 robots at the Cao Bang Walking Street, providing an opportunity for students to access STEM education.*
2. *Bring VEX 123 Robotics to teachers at 1/6 Kindergarten, Cao Bang City.*
3. *STEM Day with VEX IQ Robotics lessons and VEX V5 experience at Trung Khanh Town Secondary School, Trung Khanh District.*
4. *VEX IQ Robotics learning and experience Programm at Lung Ga School - Ngũ Lão Primary School, Hoa An District, Cao Bang Province.*
5. *Project Universalize VEX GO Robotics to teachers and students at Hoa Chung Primary School, Cao Bang City.*

As the Chairman of the People's Committee of Cao Bang Province, I am proud of what team 11 – 36070M has done, is doing, and will continue to do. I also deeply appreciate the efforts and successes the team has brought to the school and the community. The team not only brings STEM education to students and teachers in the city center but also strives to spread these values to remote areas of Cao Bang Province. These meaningful activities have helped bridge the gap in technology education, providing more students with opportunities to access new knowledge.

Trân trọng,

Sincerely,

Chủ tịch UBND tỉnh Cao Bằng

Chairman of Cao Bang Province People's Comitee

Certificate of Recognition from the **Chairman of Cao Bang Province**

Us on Newspapers

1. https://www.youtube.com/watch?v=fB8GZqbkJeM&ab_channel=Truy%E1%BB%81nh%C3%ACnhCaoB%E1%BA%B1ng
2. https://www.youtube.com/watch?v=A8SV2ckwyp0&ab_channel=Truy%E1%BB%81nh%C3%ACnhCaoB%E1%BA%B1ng
3. https://www.youtube.com/watch?v=sXJLHDACyYM&ab_channel=Truy%E1%BB%81nh%C3%ACnhCaoB%E1%BA%B1ng
4. https://tinhdoan.caobang.gov.vn/index.php/tin-tuc/doi-tuyen-robotics-11-cao-bang-tham-du-giai-vo-dich-the-gioi-robot-vex-va-vuot-hon-mot-ngan-bac-tren-bang-xep-hang-the-gioi-1607.html
5. https://thptchuyencaobang.edu.vn/index.php/tin-nha-truong/doi-robotic-11-truong-thpt-chuyen-cao-bang-dat-3-giai-tai-giai-vo-dich-quoc-gia-vex-robotics-2024-254.html
6. https://giaoducthoidai.vn/hoc-sinh-cao-bang-thang-hang-tai-dau-truong-robotics-lon-nhat-the-gioi-post681481.html?gidzl=_3vNNvFsq3B-855Gbk_OFFqXNrY8kDfev2LJMupiqZRkSGTIrBs00-js05FHku9Zko850MPR-B1LbFVNEW
7. https://congdankhuyenhoc.vn/cao-bang-gap-mat-doi-tuyen-hoc-sinh-tham-gia-giai-dau-robotics-the-gioi-17924041616012070 7.htm
8. https://baocaobang.vn/gap-mat-doi-robotics-11-truoc-khi-tham-gia-vex-robotics-quoc-te-2024-3168643.html
9. https://tuyengiaocaobang.vn/index.php/tin-trong-tinh/gap-mat-tuyen-duong-hoc-sinh-giao-vien-dat-thanh-tich-cao-tai-cac-ky-thi-cuoc-thi-cap-quoc-gia-quoc-te-1465.html
10. https://ldld.caobang.gov.vn/vi/news/cong-doan-cap-tren-co-so/cong-doan-nganh-giao-duc-va-dao-tao-cao-bang-tang-qua-dong-vien-doi-robotics-11-cua-truong-trung-hoc-pho-chuyen-cao-bang-truoc-khi-doi-tham-gia-thi-dau-giai-vex-robotics-world-championship-nam-2024-tai-bang-texas-hoa-ky-2325.html
11. https://congdankhuyenhoc.vn/cao-bang-gap-mat-doi-tuyen-hoc-sinh-tham-gia-giai-dau-robotics-the-gioi-17924041616012070 7.htm
12. https://www.facebook.com/watch/?v=244343937601958 7
13. https://baocaobang.vn/doi-robotics-11-truong-thpt-chuyen-xep-hang-49-the-gioi-tai-cuoc-thi-robotic-quoc-te-vex-robotics-wo-3168959.html

Our journey is far from over. Just like the young Mong student Nguyen Van Dinh whose initial shy transformed into a passion for robotics, we believe that every child in Cao Bang deserves the chance to discover the power of STEM. Team 36070M is committed to continue our outreach efforts, expand our programs, and inspire the young students generation of innovators, engineers, and problem-solvers. We envision a future where Science-Technology-Engineering-Mathematics education is not a privilege but a fundamental right and where the spark of curiosity, once ignited, illuminates the path to a brighter future for all of Cao Bang.

We are more than just a robotics team; we are a testament to the power of STEM to transform lives, one robot, one student, and one community at a time, starting from Cao Bang Province.