

Changing Perception of Digital Skills in Vietnam

Increasing the number of women and girls in the IT industry by 500%
through an in-person program and online learning platform to train students' digital skills



Executive summary

Problem

96% of students are unprepared to enter the digital economy because of the outdated digital skills curriculum

Although 96% of Vietnamese students have access to the internet, they are not exposed to, nor guided into learning modern computer science. This is a contributing factor as to why **only 0.3% of the population is employed in the digital economy**. In 2020, Vietnam had 100,000 IT Engineer positions vacant and this number is projected to increase to 190,000 unfilled IT jobs in 2021.

Solution

In-person digital skills program and online learning platform to train students' digital skills

A **free** coding program for upper and lower secondary students in Vietnam with primary implementation in rural areas. The **curriculum is built with** experienced technology education organizations: SheCodes Vietnam and FOSSASIA. We will also introduce a gamified **online platform** that keeps track of students' progress, which can be used for company hiring and university admissions.

Impact

Increasing the number of girls and women involved in the digital economy by almost 500%

Over the next 5 years, **204,600 Vietnamese students** aged 12-18 will participate in this program for a cost of **\$3,840,831 USD**. This has the potential to increase the **womens' Vietnamese digital workforce** by 481%, and the total digital workforce by 66%. IT engineering jobs offer a preliminary **salary of up to 4 times** the average Vietnamese salary, which increase Vietnam's GDP by at least **\$44,432,280 USD**.

[Here are the sources for the entire deck, organized by slide number](#)

Vietnam is ready to be involved in the digital economy

Girls' are not hindered by gender discrimination, Vietnam reduced poverty rates from 70% to 6%, and their digital economy is expected to almost quadruple by 2025

Vietnam is prioritizing the digitization of its economy, creating an opportunity to increase the number of women involved.

Gender discrimination does not hinder girls' opportunities to learn

According to the 2019 Vietnam Census, **86% of citizens do not have a religious affiliation**, minimizing cultural barriers against girls' education.

However, **only 7% of technology workers are women** in Vietnam.

Girls perceive computer science as too difficult for them so they opt for social sciences and business in university.

Exponential quantitative economic development in the past 20 years

In 20 years, poverty rates declined from 70% to 6%, which means that more than **45 million people were lifted out of poverty**.

Internet access increased from 1% to almost 100% in both urban and rural areas.

Since 2000, Vietnam consistently had a **yearly GDP growth rate of 6% or more**, which makes it one of the fastest growing economies in Asia.

The value of the digital economy is expected to almost quadruple by 2025

In 2020, Vietnam's digital economy reached \$14 billion USD and is projected to reach \$52 billion USD by 2025.

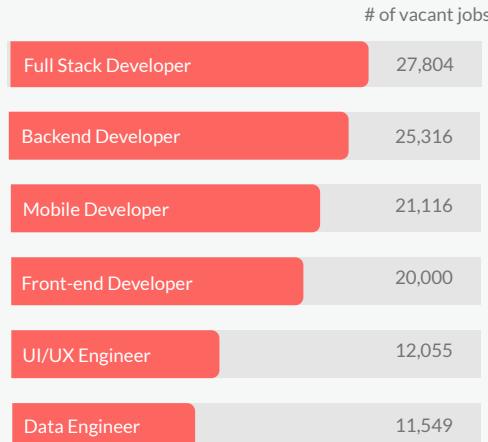
Vietnam's impact on the global digital economy is less than **one-tenth of its potential** on a per-capita basis.

The monthly **salary of a developer** with less than 2 years of experience is \$520 USD, which is **almost 4 times greater than the average Vietnamese salary**.

The public school computer science education is outdated

There is a massive disconnect between what is taught and what is needed in the programming industry

Vacant Programming Positions in Vietnam in 2021



What Students Need For Programming Jobs

Full Stack Development: HTML, CSS, Javascript (for frontend) and Ruby, PHP, Java, .Net, and Python (for backend).

Backend Development: Ruby, PHP, Java, .Net, and Python.

Mobile Development: Java, Python, PHP, C#, C++

Frontend Development: HTML, CSS, Javascript

UI/UX Engineer: HTML, CSS, Javascript

Data Engineer: SQL, Python, Java, R.

What Skills Students are Learning

Grade

5

Windows 3.1 (made in 1992)

7

Microsoft Office

9

Scratch (a preliminary visual block-based platform used for creating animations, but is not practical in the programming industry)

We talked to 100 students in Vietnam

Rural students don't know how to be digitally involved and urban students don't learn digital skills since it doesn't help get them into university

Rural

"I want to get involved in the urban economy, I just do not know how. School teaches me Microsoft Office which does not really help me that much."



Nguyễn Tuấn Kiệt
Rural Vietnam High School Student

21 out of 23 Rural Vietnamese students surveyed said that they want to learn to code.



Urban

"Most of us are busy preparing for university entrance exams and because computer science is not on the exam, it doesn't make sense for me to learn it on my own."



Lê Quốc Đạt
Urban Vietnam High School Student

77 out of 77 Urban Vietnamese students surveyed said that they would learn to code if it was required by university exams.



Targeting students aged 12-18

The goal is to expose students to computer science and have them realize it is not as difficult as they perceive

University computer science curriculum is not a problem

The university education for computer science in Vietnam is world-class, and many Vietnamese companies offer training to new, competent IT engineers.

Vietnamese students perform well in school

Vietnamese students were ranked 8th out of 37 countries on the PISA which tests students' abilities in math, science, and reading comprehension.

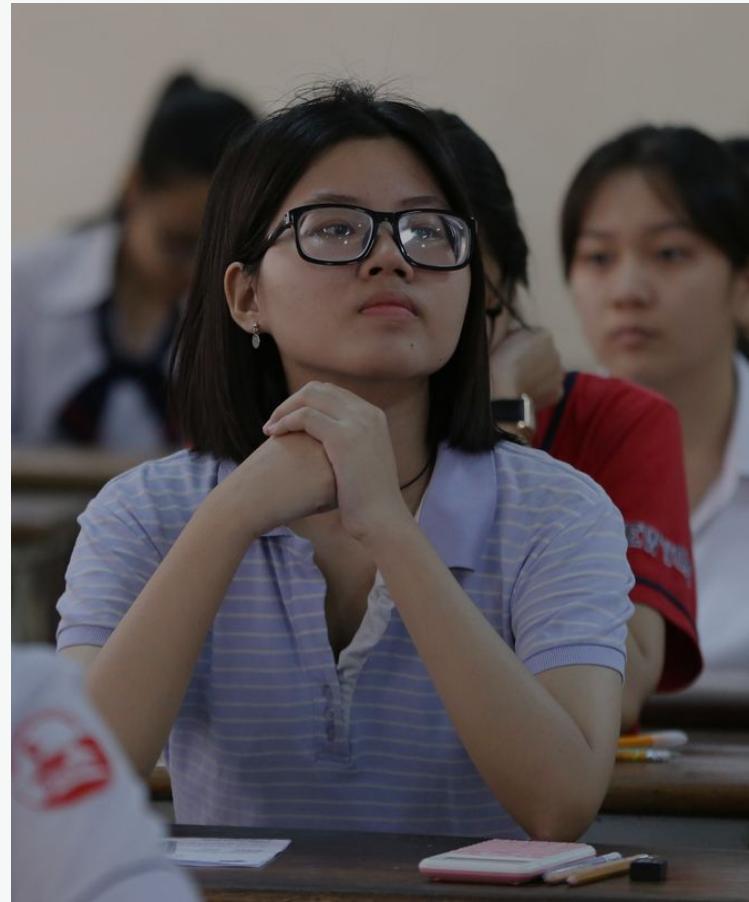
However...

Good computer science programs are difficult to get into

A student's score on the standardized university entrance exam determines what program they get into, with computer science being the top one. This exam only tests math, life sciences and literature. High school students only study what is on the university exam.

Vietnamese girls are undermining their IT abilities

We spoke to 50 high school girls and found that girls intentionally opt out of computer science programs because both parents and students believe that it is too difficult for girls. Instead, girls are encouraged to study either social sciences or commerce.





Targeting both girls and boys

6

Insights after speaking to experts and over 100 students aged 14-24, a co-ed program will benefit girls more than a girl only program

Co-ed hackathons with a mandatory rule of 1 girl per team encourage girl participation more than girl-only hackathons.

This way, we create an environment where boys are encouraging girls to work with them and fostering that mindset for the future.



Astha Bhat Sheth

Global Account Manager at Angel Hack

A co-ed program will not interfere with girls' success

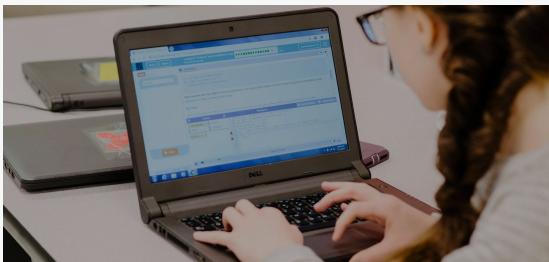
There are **not enough** of both girls and boys involved in computer science because Vietnamese society perceives computer science to be difficult. Based on the experts and 100 students we've spoken to, creating a co-ed implementation with a **50/50 split** will be of benefit for girls more than a girl only program. We are open to change this plan if it hinders girls' participation.

7

Solution: A walkthrough of the program

Teachers are trained to teach students (to access more people faster). After the program students can earn a tablet to continue working on their projects

Teacher Training



Why: Trained teachers needed for education infrastructure and student training (next step)

How: Asynchronous online code learning through a curriculum developed by education professionals

Cost: Dependant on the agreed amount with partners developing curriculum

Time: 2 months during summer break

Outcome: Teachers understand the basics of web development to help guide students

[Click here to learn more](#)

Student Program



Why: Students need guidance to pursue computer science in high school

How: the first two months, use guided curriculum and platform (next slide), last 3 months work on projects with basic teacher assistance.

Cost: \$2,304,000 for the over 2,000 schools we are going to expand to without a computer lab.

Time: 30 students in 5 month periods.

Outcome: Students understand the basics of programming, which changes perspective and allows them to pursue computer science.

[Click here to learn more](#)

Post-Program



What: Students can earn a device if they reach the top 5% of students on the platform, train a teacher, work for a company we partner with.

How: Use our platform (next slide) to track progress.

Cost: \$150 per student who helped us expand to a new school or who does not already have a device.

Time: Until they go to university or find a job.

Outcome: Students have a device to continue working on their portfolios that can be used for getting hired at companies we partner with and for university admissions.

[Click here to learn more](#)

Progress tracking portfolio platform

The platform provides a curriculum for guided learning, allows us to track students' progress, and used for university and company recruiting

Curriculum to guide students

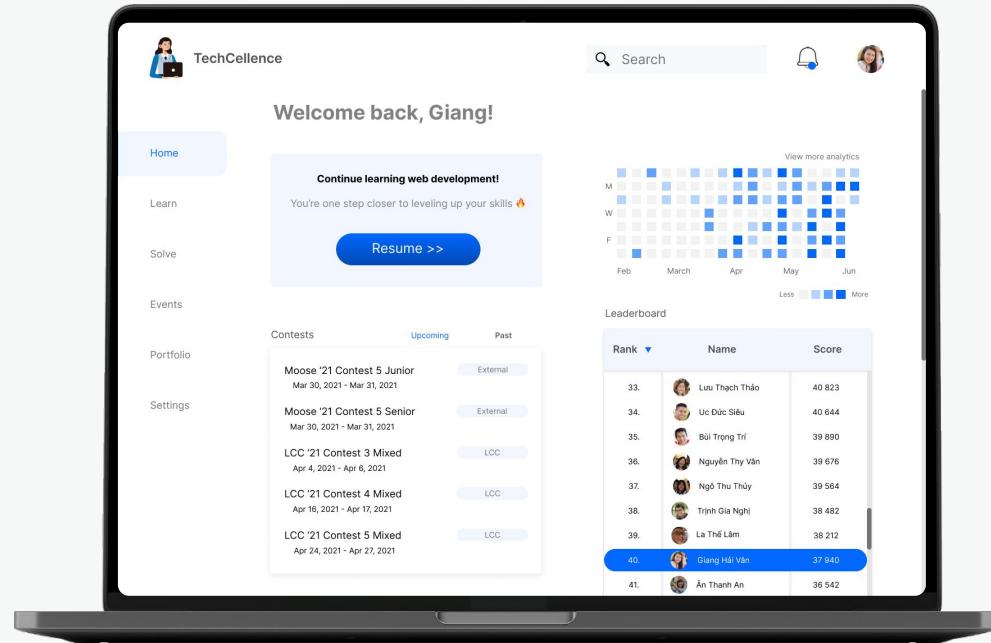
One problem for many independent learners is that it takes a long time before finding the right sources for learning. This platform provides a curriculum that reduces the time needed to search for educational resource.

Tracking student progress upon program completion

Without progress tracking, a long-lasting impact on students cannot be quantified. A platform with a portfolio feature ensures that we are able to know if we had long lasting impact on students

Top students can get trained and hired by companies

Over the next 5 years, Axon and HCL (major technology companies) need 10,000 developers. Both are open to discussion about training and hiring our platform's top-performing students.



Student enrollment and school device expenses

We train 204,600 students with \$2,304,000 USD

Year	30	Student #	Expenses (School devices)
2022	120	600	\$9,000
2023	480	2,400	\$18,000
2024	1,920	9,600	\$108,000
2025	30	38,400	\$432,000
2026	120	153,600	\$1,728,000
Total	480	204,600	\$2,304,000

1. To get the number of students, we multiply the number of schools by 60 (number of students/year). Once we implement in a specific school, we get a new set of 30 students every 5 months or 60 students every school year. Every year we add the number of schools to that of the previous year.
2. Only 20% of rural schools do not have 30 devices. We will provide them with 30 tablets to ensure that these schools can participate in our program. We buy tablets due to their ability to withstand the humidity of rural areas.
3. Tablets cost \$150 USD retail. 30 of them cost \$4,500. Buying wholesale may be up to 50% cheaper, or otherwise, we could buy refurbished devices to reduce cost.
4. Even though you can program on a tablet, it might be the best experience. If we find this to be a problem then we would buy computers which would be 3 times the price.

[To see different possibilities of student number and cost](#)

Student enrollment and school device expenses

We train 204,600 students with \$2,304,000 USD

Year	Student Trainer #	Students Who Reached Threshold From Platform (top 5%)	Expenses (Student Devices)
2022	30	30	\$9,000
2023	120	120	\$36,000
2024	480	480	\$144,000
2025	1,920	1,920	\$576,000
2026	2,560	2,560	\$768,000
Total	5,110	5,110	\$1,536,831

Different possibilities of student number and cost

1. We assume that 5% of program students will assist in training new teachers in new schools. These students will be participating in workshops with SheCodes to educate teachers on programming fundamentals.

2. We take the top 5% of students and we provide them and provide them with a tablet to continue working on their project after the program.

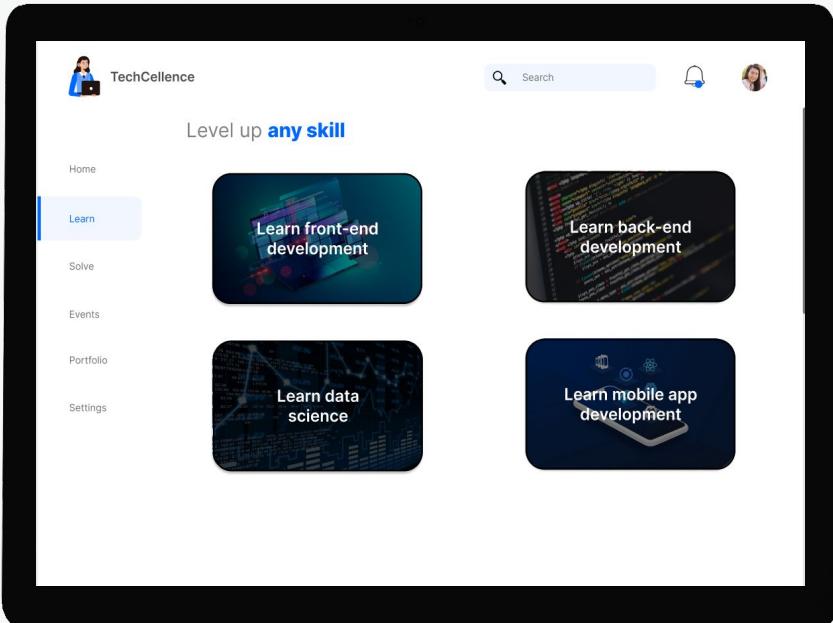
3. Each student trainer or high performer (top 5% in score) on the platform is compensated with a tablet costing around \$150 dollars USD (retail). Buying wholesale may be up to 50% cheaper.

4. On the final cost \$3,831 is added to cover the cost of a Vietnamese Full Stack Developer working to build our app within 3 months.

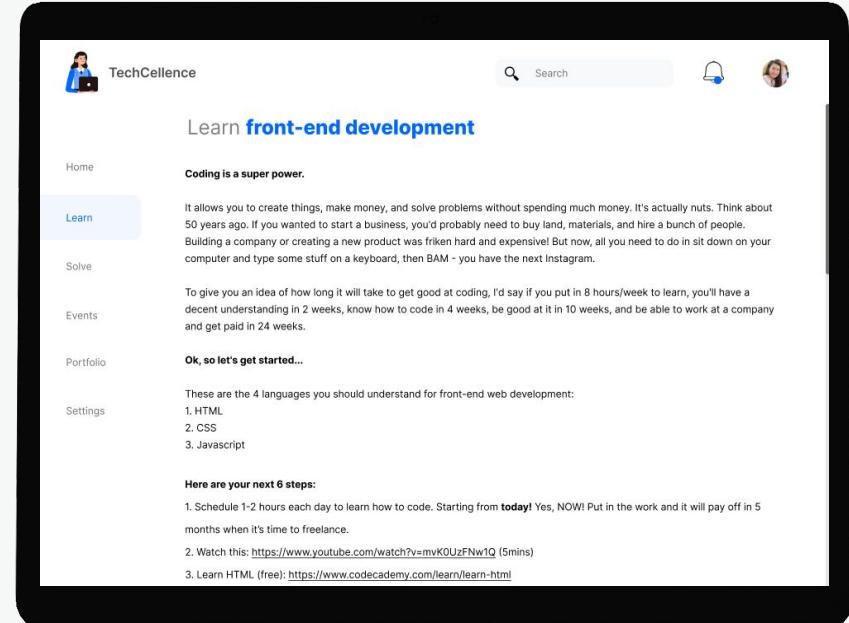
How these students are helping us with expansion

Platform overview: Learn section

A centralized curriculum for all students, built by education organizations to minimize friction between learning



The screenshot shows the TechCellence platform's 'Learn' section. At the top, there's a navigation bar with a user icon, a search bar, a notification bell, and a profile picture. Below the navigation, a banner says 'Level up any skill'. On the left, a sidebar lists 'Home', 'Learn' (which is highlighted in blue), 'Solve', 'Events', 'Portfolio', and 'Settings'. The main content area features four cards: 'Learn front-end development' (with a code editor background), 'Learn back-end development' (with a terminal window background), 'Learn data science' (with a circuit board background), and 'Learn mobile app development' (with a smartphone background).

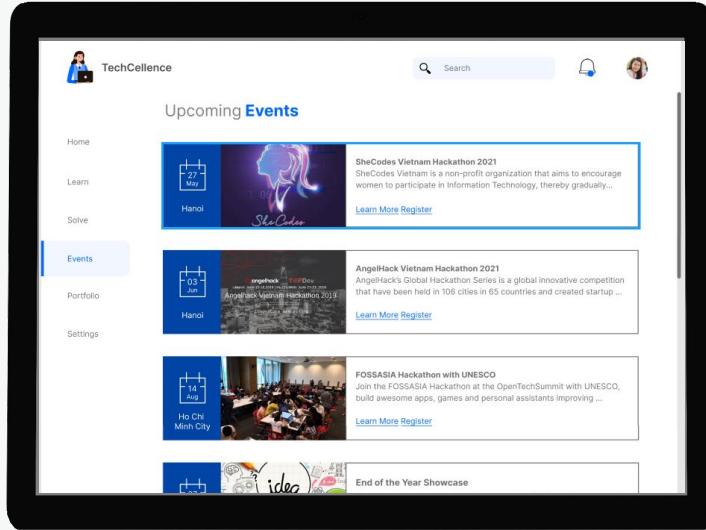


This screenshot shows a detailed view of the 'Learn front-end development' section. The top navigation bar is identical to the previous screen. The main content starts with a heading 'Learn front-end development' and a sub-section 'Coding is a super power.' It includes a paragraph about the accessibility and cost-effectiveness of learning coding. Below this, there's a section titled 'Ok, so let's get started...' with a list of four languages: HTML, CSS, JavaScript, and another language that is partially cut off. At the bottom, there's a section titled 'Here are your next 6 steps:' with three numbered items: 1. Schedule 1-2 hours each day to learn how to code. Starting from today! Yes, NOW! Put in the work and it will pay off in 5 months when it's time to freelance. 2. Watch this: <https://www.youtube.com/watch?v=mvKOUzFNw1Q> (5mins) 3. Learn HTML (free): <https://www.codecademy.com/learn/learn-html>

[Platform overview video](#)

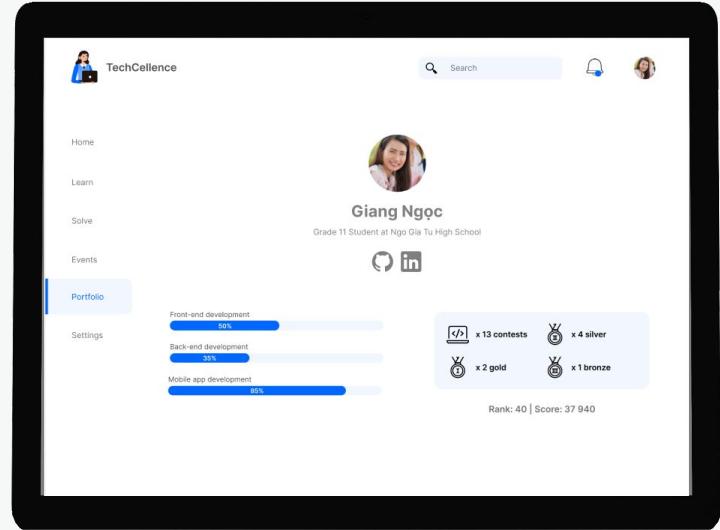
Platform overview: Events & portfolio

The point system of the leaderboard is used as a metric for companies and us to provide high-performing students with devices if they don't own one.



Why Events?

This section of the platform will outline all upcoming events, to decrease friction between the student and participation in hackathons and workshops. Events would be organized by external organizations such as SheCodes and FOSSASIA, which allows for minimal effort with high impact.



Why a leaderboard?

The leaderboard is meant to show top performers in the program. The scores will be translated from the DMOJ competitive programming platform. The goal of DMOJ is to get students to practice for problems they are likely to receive in coding interviews. Scores on the leaderboard will be used by companies to recruit high-performing students. Students will also be given tablets based on their scores.

What students are saying

91 out of 100 Vietnamese students surveyed showed interest in the program.



This is going to encourage me and my peers to actually learn to code. It would be really cool if this could help us get into university, everyone else would do it too.



The way we are taught computer skills in school is very old. This sounds like something that would help people like me get urban jobs.



Thùy Linh

Urban Vietnamese high school student



Tu Huy

Rural Vietnamese high school student



[More students quotes here](#)

UNESCO Vietnam agreed to implement this project

More specific details on UNESCO Vietnam's involvement is currently in discussion



Michael Croft

Michael is the Head of Office and UNESCO Representative to the Socialist Republic of Vietnam.



From what you explained to me so far I think this is a great idea and it can help the new digital component of the We Are ABLE program. I can confirm that **UNESCO would be open, in principle, to collaborate with your initiative.**



The partnership with UNESCO provides us with close ties with the MOET (Ministry of Education and Training) in Vietnam. This means that if the program is implemented, the **approval process to be able to start working with schools will take significantly less time**. UNESCO also has access to schools through the We Are ABLE program, which is focused on rural ethnic communities. Collaboration with this initiative **can increase our access to students, and therefore, decrease friction when scaling.**

We have in-person partnerships to help with the implementation

These partnerships will help us in curriculum building, provide us with schools to partner with, and get our top students recruited



Mario Behling
Co-Founder of FOSSASIA

"From my 15 years of experience, this program sounds like it is really going to work. Looking forward to more conversations about how we can help each other achieve a common goal."



Tien Mai
Co-Founder of SheCodes Vietnam

"The concept of students working for their own tablets is brilliant. I am excited to begin working with your initiative."



Daniel Keller
VP of Dariu Foundation

"As the head of development on our board, I'm confident that a partnership between The Dariu Foundation and your initiative will help scale and significantly improve our model."



Elizabeth Hart
Senior VP of People at Axon

"With Axon's expansion to a new country [Vietnam], we are open to a conversation about collaborating with your initiative."

[Detailed partnership guide with LOIs and more specific terms of the agreement](#)

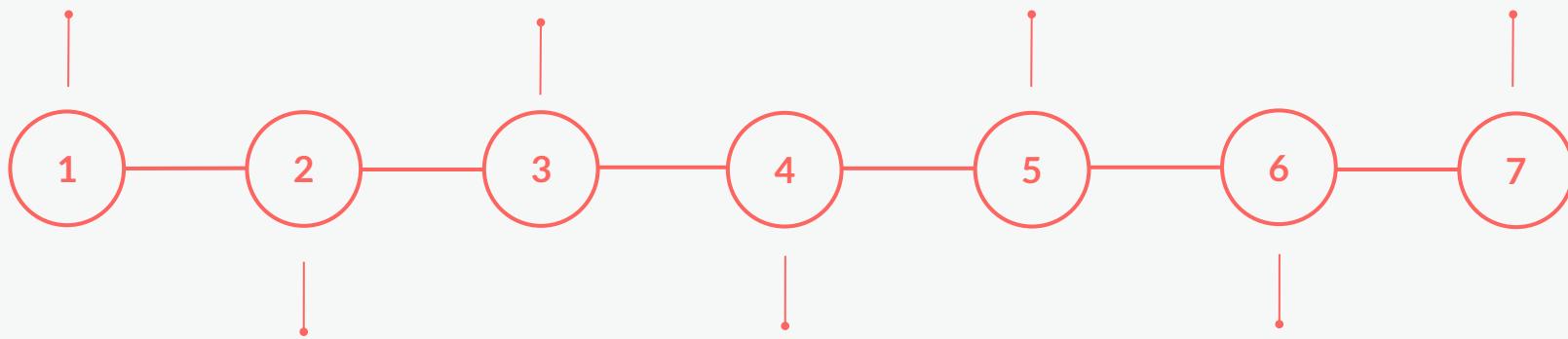
Pilot Overview

Discuss and create official partnerships with UNESCO, She Codes, Axon, FOSSASIA, and Dariu Foundation.

Contact the 10 schools that Dariu Foundation already works with. Once the ministry of education has agreed to implement it, schools will comply with the ministry.

Begin implementation of the program in the 10 schools in accordance with slide 8 & the solution overview page, as well as the partnerships.

Hire a freelance developer to develop the platform. With the simplicity of the platform, we estimate that this should take about 6-8 weeks.



UNESCO Vietnam will help connect us with the Ministry of Education and Training, to get approval for this pilot in public schools.

Contact SheCodes for the IT professionals who will host workshops to train 10 teachers for 2 months. Use the curriculum overview provided in the appendix.

100 urban students from SheCodes Vietnam are sent emails with curriculum, DMOJ contest website, and a list of upcoming hackathons/events for the platform pilot. If students use it, proceed to develop the platform.



Dariu Foundation in rural Vietnam

Students are not taught practical skills and they are not optimizing for building infrastructure

What they do

Dariu Foundation teaches scratch, micro:bit, and Arduino for students aged 9-15. Since 2011, they trained more than 450,000 students on basic computer skills in Vietnam.

What they do well

1. Give teachers a curriculum to teach to their students, since they don't usually get guidance.
2. Have close ties with the provincial government and therefore, can implement their solution in a new school faster.
3. They operate mostly locally, so they have direct influence on the community.

Why it isn't working

1. Students are taught to do simple engineering projects, but not taught practical coding skills.
2. They do not track the progress of students after program completion.
3. They train teachers individually through workshops, which limits scalability.
4. Teaching students individually slowing down their ability to scale.

Why this is the best solution

Training teachers and building curriculum to optimize for smoother government curriculum changes and using partnerships & student trainers to scale



In-person Partnerships

Dariu - access to 300 schools in rural Vietnam.

UNESCO Vietnam - government connections.

SheCodes & FOSSASIA - professional curriculum.



Teaching Training

Optimize for building infrastructure for improved curriculum introduction, hence we train teachers.

We also give teachers a structured curriculum, which isn't usually offered to them in rural areas.



Extreme Scalability

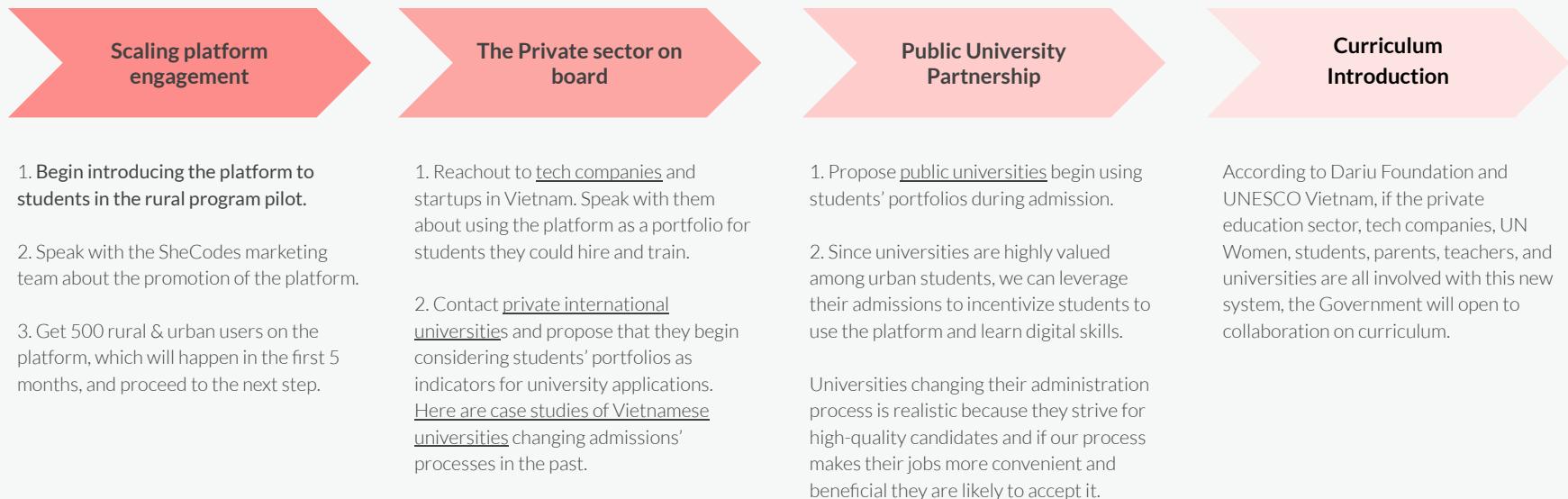
With our student trainer model, we can reach more teachers while also minimizing our expansion costs.

With a partnership for devices, we can minimize costs even further.

The goal: Curriculum implementation in Vietnam

Once parents, teachers, the private education sector, UNESCO Vietnam, and students are involved, so will the national government.

We've spoken to 4 organizations that have been trying to change Vietnam's curriculum for 15 years, here is the approach we recommend, once pilot is finished.



The curriculum will change when we show an economic benefit

The economy is Vietnam's number 1 priority, when our program shows good potential economic benefit then the Government will be on board



Foreign Direct Investment (FDI)

In 1986 Vietnam launched its policy of **Doi moi** (or 'Renewal'), which involved foreign direct investment (FDI), creating an unprecedented international commercial and economic development. Vietnam's GDP went from 14 billion in 1985 to 36.6 billion in 2 years, which is more than a 250% increase.

Before making the decision to accept foreign investment they looked at how other countries increased their GDP to make sure that this strategy works. The 2 examples they took into account were China and the US, two economic powerhouses.

In 1978, after accepting FDI, China increased its GDP from \$149.5 billion to \$191.1 billion in 2 years. The United States started accepting FDI in 1960 and in 2 years their GDP went from \$543 billion to \$605 Billion.

What we can learn from this

From the examples above, it is clear that Vietnam takes a decade or two before making an important decision. Their plan is to find what works, follow it and therefore, avoid mistakes associated with trial and error. For the government to see value in our program we need to implement nationwide and prove a wide-scale positive impact on program students and their GDP. Organizations have been trying to change the curriculum for about 15 years, so our program could be the final push to get it there.

The realistic outcome by 2026

204,600 students have the skills to be involved in the digital economy, and we operate in ½ of Vietnam's rural secondary schools



**204,600 PREPARED TO ENTER
DIGITAL ECONOMY**

STUDENTS

204,600 students will have the skills to be involved in the digital economy. Some of the students will be trained/employed by the companies we partner with. The women's Vietnamese digital workforce will also increase by 481%, and the total workforce by 66%.



**IMPLEMENTED IN 2,560
SCHOOLS ACROSS VIETNAM**

SECONDARY SCHOOLS

Operating in 1/2 of all rural secondary schools in Vietnam, with 2,560 teachers trained with basic programming skills. We can then, expand to almost all rural secondary schools in the following couple of years.



**CHANGING THE WAY VIETNAM
PERCEIVES DIGITAL
EDUCATION**

ENTIRE EDUCATION SYSTEM

Universities begin considering students' portfolios for admissions and more students begin applying to university for Computer Science. high school curriculum changes to teach and expose to more applicable computer science skills.

What we need from the UN

We need people to implement this solution in person, diplomatic appearances at showcase events, and \$3,840,831 to afford devices to make this program succeed

In-person Implementation



Projects that are implemented internationally approach often fail because there is a big disconnect between locals and non-locals because international representatives who have never been to Vietnam don't understand the status quo and more importantly don't understand the people. If the communication is not effective the citizens will not be on board with this program. **With in-person implementation through UN's connections will ensure that the community is onboard faster.**

Diplomatic Appearances



SheCodes Vietnam, who will organize showcases for our students to show what they have worked on throughout the program. For the government to change the curriculum they need to see a positive impact on students and the only way to do that is for them to see what students are working on. If a UN Representatives' appearances will increase the likelihood of government attendance/participation due to the UN's rapport and credibility within Vietnam.

Funding



We need \$3,840,831 USD from the UN to provide devices for student trainers, high-performing students on our platform, and providing 30 devices for schools who that not have enough devices. A partnership with an organization that provides us with free or discounted tablets would greatly reduce the cost.

Gaps

1

We do not guarantee a monetary ROI for the UN within 5 years

We aim to develop skills and influence the education system, not make a profit.

2

Unsure about funding needed for SheCodes Vietnam

According to our letter of intent, the UN would be providing funding to SheCodes Vietnam in exchange for curriculum guidance and IT professionals for teacher training.

3

We cannot ensure that all schools will want to cooperate

We provide a model that allows us to expand 2,560 schools in 5 years, however, this is also dependant on schools.

1

30 kids in every school will enroll every 5 months

Assumption based on the 91 out of 100 surveyed students who showed interest in the program.

2

We can influence parents through teachers

Teachers are a strong figure in the social hierarchy and parents are in their circle of influence. According to the 100 people we spoke to if teachers validate this program, so will the parents.

3

Rural teachers are on board with external programs

This assumption is based on the Dariu Foundation. Based on those conversations we also assume that teachers have at least 10 hours per week to spare.

[Detailed gaps and assumption guide](#)

Playbooks

All the Tiny Details You Might Need



If this project fails, why?

[Pre-Mortem](#)



What is the curriculum for teachers and students?

[Curriculum](#)



Where can I find a detailed plan of gaps and assumptions?

[Gaps and Assumptions](#)



What is the value proposition of the platform?

[Value proposition](#)



Where can I find a detailed explanation of the solution?

[Detailed solution](#)



How are the partnerships useful?

[Partnership plan](#)



How do we expand to schools quickly?

[School Number Modeling](#)



Where can we access all the playbooks?

[Recommendation Hub](#)