



ASEAN FOUNDATION

Future Ready ASEAN

A toolkit for educators to provide effective and inclusive computer science training



An ASEAN Foundation platform, developed in partnership with Microsoft.

FOREWORD

The ASEAN Foundation is an organization from and for the people of ASEAN. As a chartered ASEAN body, the ASEAN Foundation is mandated to support ASEAN mainly in promoting awareness, identity, interaction, and development of the people of ASEAN. The ASEAN Foundation comprises of 10 member states Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, The Philippines, Singapore, Thailand, and Viet Nam.

The Future Ready ASEAN initiative is intended to equip 46,000 underserved youth aged 15 to 35 years old (ages of population categorized as youth as per ASEAN's definition) with 21st century skills that they require to face the digital age and Industrial Revolution 4.0. The target participants include educators from all disciplines who want to include computer science in their classroom, and in an inclusive manner. Other target participants include female and underserved youth residing in slum and remote areas.

At the same time with the Future Ready ASEAN website, along with its communication strategy built around the initiative, Future Ready ASEAN is expected to empower as many youth across ASEAN with certified digital skills.

PUTTING THIS TOOLKIT TO USE

Use this toolkit and its activities for your first day of engagement with your students. It is important that the aspect of gender responsiveness and inclusive computer science training are addressed on the first class.

We recommend regular contact with your students on how they are progressing with the platform every two weeks. You may use the learning progress sheet and note pages on this toolkit to help you with this process.

Do explore the resources on the Future Ready ASEAN website, along with updates to the program on our social media pages.

*"Give our youth
a fish and you feed
them for a day; teach
our youth to fish and
you feed them for a
lifetime"*



Partners



ASEAN Foundation

ASEAN Foundation is an organisation from and for the people of ASEAN. We exist because of one vision: to build a cohesive and prosperous ASEAN community.

Our mission is to commit to promoting ASEAN awareness through people-to-people interaction and collaboration with ASEAN stakeholders to help ASEAN build a caring, cohesive, equitable and peaceful ASEAN Community.

Since 1967 ASEAN has gone on a long journey to accelerate the economic growth, social progress and cultural development in the region. As one of ASEAN's body, we are tasked to support ASEAN mainly in promoting awareness, identity, interaction and development of the people of ASEAN.

We unite people. And, we help to develop them.



Microsoft

Microsoft enables digital transformation for the era of an intelligent cloud and an intelligent edge. Its mission is to empower every person and every organisation on the planet to achieve more.

As the digital economy has grown, the demand for skilled workers in STEM and computing fields has far outpaced the number of computer science graduates. Our goal is to ensure all young people are future-ready and have access to the digital skills that employers seek—from basic digital literacy to computer science.



Empire Code

Empire Code Education teaches children from as young as age of 5 to the young at heart at 70. We teach the mindset of computer science and coding languages for industry use. Classes are taught at our center, schools, philanthropies and corporate organisations. We provide computer science exchange programs for foreign students too.

Empire Code advocates inclusivity in our tech era and believes that ALL can code. Our mission is to align ourselves with global plans for our next generation in the tech industry, to equip our future thought leaders with crucial skills as coding will soon be one of the most valuable job skills across industries.



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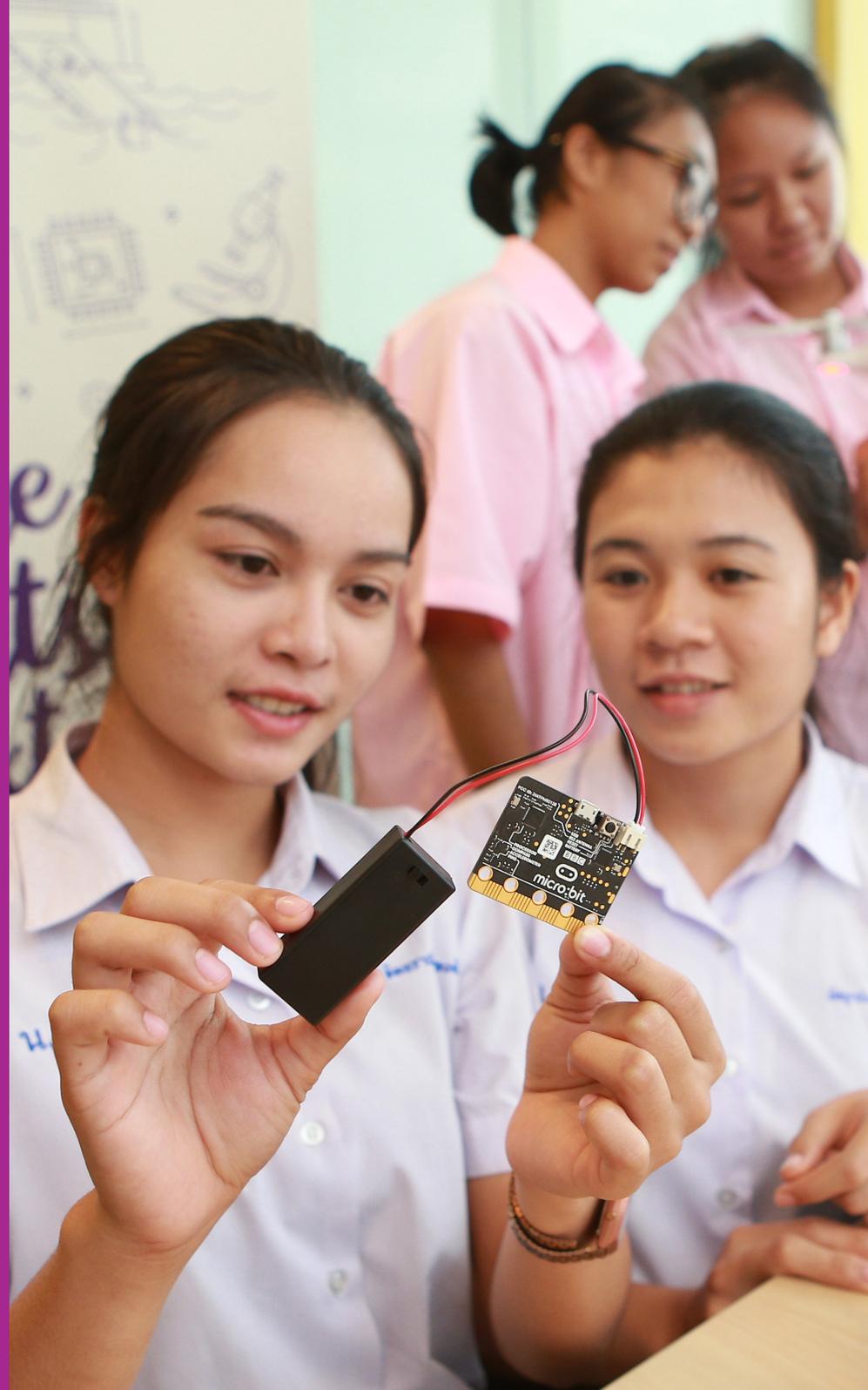
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The Future Ready ASEAN Platform



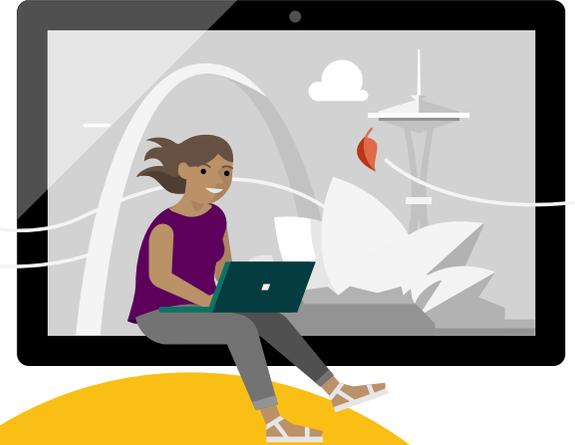
Overview

Why

From basic digital literacy to advanced computer science, digital skills are often out of reach for the young people who need them most. In a world being transformed by technology, all youth should have the opportunity to develop the creativity, critical thinking, and problem-solving skills gained by learning digital skills.

What

Future Ready ASEAN is an online platform to empower all learners, in particular young women, to be future-ready through digital skills. It is structured along four learning tracks that lead to completion badges and can be complemented by courses leading to Microsoft's industry-recognised certifications. This platform has been developed by the partnership of ASEAN foundation, Microsoft and Empire Code, as part of the ASEAN Digital Innovation Program.



When

Launched in March 2019, for the first year, this program aims to train 520 teachers and 46,000 underserved youth aged 15 to 35 on digital skills, in particular computer science education, to enable them to thrive in the fourth industrial revolution.

The program is expected to scale wider in following years.

Where

The trainings will leverage the Future Ready ASEAN platform and conducted by Empire Code as master trainer in seven ASEAN countries: Cambodia, Indonesia, Malaysia, Myanmar, the Philippines, Thailand and Viet Nam.

Who

You as a teacher or student mentor who has completed at least one Future Ready ASEAN online learning track. You can use this resource as a way of reaching out to ASEAN youth. This includes youth of varied educational backgrounds and diverse cultures.

The Online Learning Tracks

The Future Ready ASEAN learning journeys are structured along four educational tracks. Participants may choose to start with any of them, though the recommended starting track is Digital Citizen.

At the end of each journey, participants will get three completion badges (beginner, intermediate, advanced) that can be shared on social media. To hone their skills even further, participants may then choose to register for one of the recommended Microsoft certifications.

Digital Citizen

Boost your digital presence by learning how to engage in professional networks and to use web development tools.

Data Wizard

Get AI ready by understanding, visualising and making sense of big data sets.

New to digital literacy?

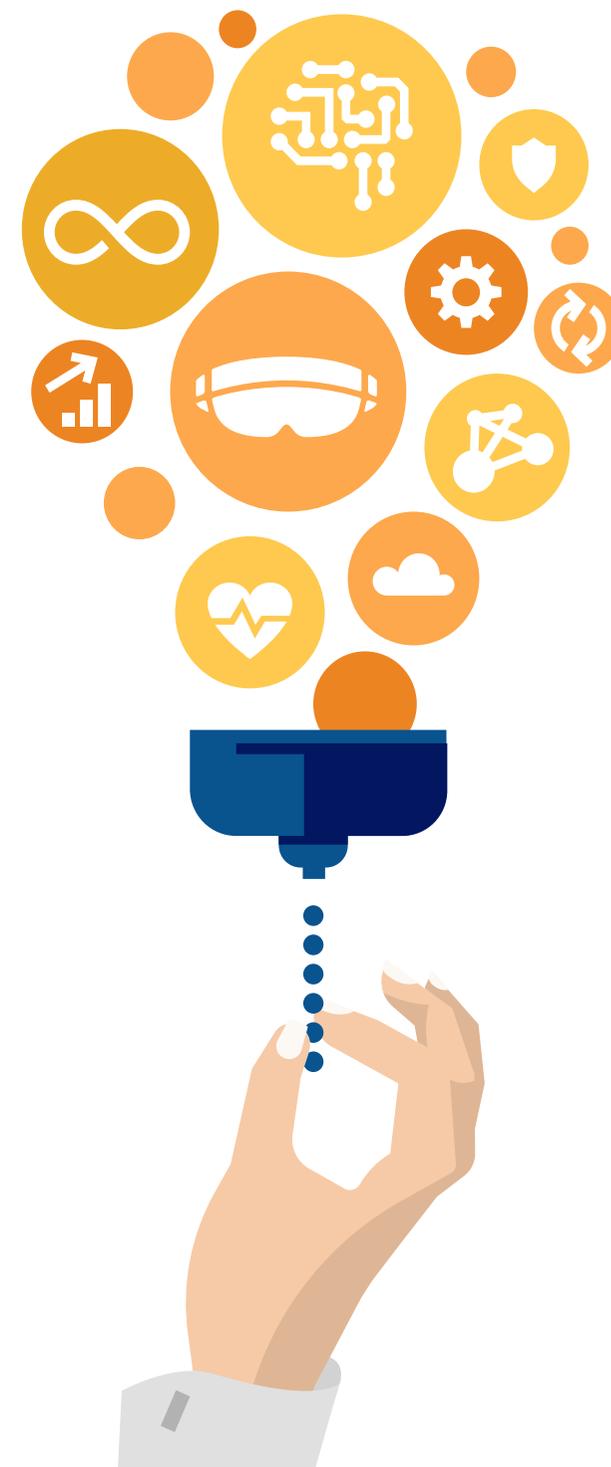
Have no fear. Students may take a fundamental course first before embarking on any of the above journeys, available on the website.

Dream Team Player

Make your team successful by gaining productivity, collaboration and project management skills.

Social Innovator

Tackle big societal challenges by learning to create technological products and applications.



Learning Progress Sheet for Students

The training roadmap is intended to be flexible for class sizes as small as 1 student to as large as 100 students. Along with the learning progress sheet based on the platform, trainers are encouraged to utilize all activities in this toolkit with students.

Write a tick in the boxes when students have completed the level

Print/Photocopy to help guide each student.

STUDENT NAME:

Digital Citizen

BEGINNER COURSES	
Minecraft Hour of Code	
Create a LinkedIn Account	
INTERMEDIATE COURSES	
HTML5 Fundamentals: content 1 to 11	
CSS Fundamentals: content 12 to 21	
ADVANCED COURSES	
JavaScript Fundamentals	
Git and GitHub	

Dream Team Player

BEGINNER COURSES	
Introduction to PowerPoint	
Introduction to Word	
Introduction to OneNote	
INTERMEDIATE COURSES	
Introduction to Teams	
Presentations with Sway	
Getting started with the Office 365 APIs	
ADVANCED COURSES	
Microsoft Office Made Accessible	

Data Wizard

BEGINNER COURSES	
Introduction to Excel	
Introduction to Power BI and Excel	
Get started with Microsoft Cognitive Services	
INTERMEDIATE COURSES	
Introduction to Data Science in Azure	
AI Developer Bootcamp	
ADVANCED COURSES	
Introduction to Python	

Social Innovator

BEGINNER COURSES	
Microsoft MakeCode with micro:bit	
Mixed Reality Basics 100	
INTERMEDIATE COURSES	
Coding with Minecraft: Education Edition	
Software Development Fundamentals	
ADVANCED COURSES	
C# Fundamentals for Absolute Beginners	

Get Engaged

Events

Get hands-on by taking part in our signature events and competition. More information is available on the website: <https://aka.ms/AA4yrc6>

FutureReadyASEAN Competitions

Software development competitions run by the ASEAN Foundation in partnership with Microsoft and Empire Code.

DigiGirlz

DigiGirlz is a program that gives middle and high school girls opportunities to learn about careers in technology, connect with Microsoft employees, and participate in hands-on STEM workshops.

Hour of Code

Hour of Code events fuel students' passion for computer science through engaging block-based programming activities.



Career Programs

Envision your future in the tech industry. More information is available on the website: <https://aka.ms/AA4yz1a>

Microsoft Internship Program

We believe that work is a place for exploration, creativity, innovation and professional growth. As a full-time university hire at Microsoft, you will learn from the finest in the business and experience an inspiring world-class program.

ASEAN Foundation Internship Program

The ASEAN Foundation Student Internship Programme provides an avenue for undergraduate and graduate students to build their sense of ownership towards ASEAN. Once your internship is finished, we guarantee that you will love ASEAN even more.

LinkedIn Resources for Job Seekers

Creating a high-quality profile, building a network and boosting your professional brand are key in your job search. LinkedIn has developed free training content for you to build a meaningful career.



Find Resources

Resources for Students

Explore more resources to deepen your knowledge related to STEM, AI, cloud, and digital civility. Links to these resources are available on the website:

<https://aka.ms/AA4yz13>

Microsoft AI School

Explore this hub to find the information, learning materials and ethical guidelines you need to start building intelligence into your solutions.

Microsoft Learn

Register for free IT training courses delivered by experts. Hundreds of courses are available, from beginner to advanced standards.

Digital Civility

Pay attention to your online persona and take steps to ensure a positive online presence, both personally and professionally.

Code.org

Explore computer science courses by Code.org, a nonprofit dedicated to increase diversity in STEM.

STEM2D.org

Engage in STEM activities with Johnson & Johnson's uniquely fun website, dedicated to young women.

SAP

Learn about SAP innovations through gamification and connections with other learners and SAP experts.



Resources for Educators

Explore curated resources for educators from all backgrounds and disciplines to be trained on high-quality and inclusive computer science education. Links to these resources are available on the website:

<https://aka.ms/AA4yrc4>

Future-Ready Toolbox for Educators

Equip your students for the future of work using game-based learning and inclusive teaching material.

Action Guide to Inspire Girls in STEM

Take action to close the gender gap in STEM by tapping into girls' creativity, providing encouragement, and connecting STEM subjects to real-world examples.

Guide to Inclusive Computer Science Education

Take concrete steps to build and expand inclusivity in computer science education.



The Power of Gender Responsiveness & Inclusive Training

Become the Change Maker

While computer science classes and opportunities are expanding, only a fraction of girls and women are likely to pursue a tertiary education or career in STEM.

Without the influences of women in computer science, we risk decades of innovation absent of female empathy and perspectives. The Future Ready ASEAN program is a gender responsive platform to encourage more young women into STEM.

Teachers have a fundamental role to play in shifting cultural perceptions of computer science and developing confidence of girls and young women who wish to pursue a course in the sector. This toolkit aims to inspire educators to become change makers, by encouraging and showcasing best practices and approaches.

Through an increase awareness of inclusive computer science education, educators like yourselves can then be inspired and equipped to be the change makers. Note that while this toolkit addresses myths and challenges that girls and young women tend to face, the approach of its' content is gender responsive.

Inclusive computer science allows all our students, teachers and student mentors to achieve their full potential in computer science education.

Your voice is important.



According to McKinsey, advancing women's equality in the countries of Asia Pacific could add \$4.5 trillion to their collective annual GDP by 2025, a 12% increase over the business-as-usual trajectory.



According to Morgan Stanley, companies with better gender equality tend to have stronger fundamentals and better performance.

Be Inspired

Life Changing Stories on ASEAN Girls in Computer Science. More information is available on the website: <https://aka.ms/AA4z6y9>



Meet Azrina from Malaysia

Across ASEAN, teachers transform communities through computer science education. Meet Azrina, who designed a lesson plan for her students to solve sustainability challenges.



Meet Thuzar from Myanmar

In Myanmar, women only account for 35% of the workforce. Meet Thuzar, who is helping to close this gap by learning and teaching web design and coding skills.



Meet Thu from Viet Nam

Rain or shine, Thu walks over a thousand steps for her coding class in rural Viet Nam and wants to use the power of technology to keep her mountain beautiful.

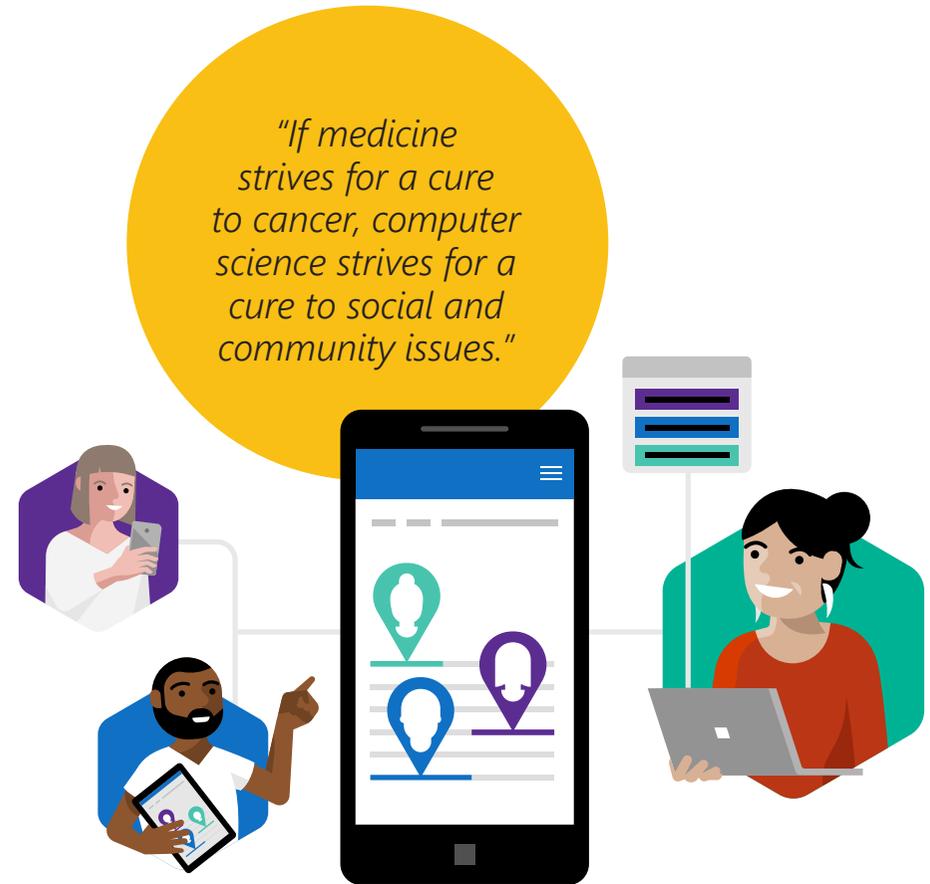


Meet Crystal from The Philippines

Empowered by her digital skills, Crystal has gained the confidence that technology will help her forge an independent life and bright career despite her visual impairment.

10 Teaching Practices By ECS (Exploring Computer Science) Teacher Practices Research

- Connect computer science learning to everyday issues
- Encourage collaboration
- Use guided inquiry one-on-one or in small groups
- Encourage exploration
- Scaffold learning by making explicit connections between lessons
- Facilitate guided inquiry during the development of student-driven final projects
- Demonstrate specific computing skills and processes
- Use journal writing for reflection
- Explain computer science vocabulary



Inclusive Training In The Classroom



Class Climate

- Create a welcoming environment
- Engage and involve students in activities and discussion
- Encourage teamwork and the sharing of multiple ideas and perspectives
- Deliver instructions clearly with straightforward language, avoid unnecessary jargon
- Summarize major points after each class



The Inclusive Teacher

- Be approachable and available
- Encourage a growth mindset
- Be empathetic to students with diverse characteristics
- Provide positive encouragement, a key in increasing interests of girls in STEM
- Provide regular feedback and customized support based on student requests and performance
- Enlist students to promote the benefits of computer science education from their own perspective students



Class Requirements

- Ensure the safety of students
- Ensure that facilities are safe, secure and accessible
- Provide materials for activities
- Provide the necessary hardware and internet access when required

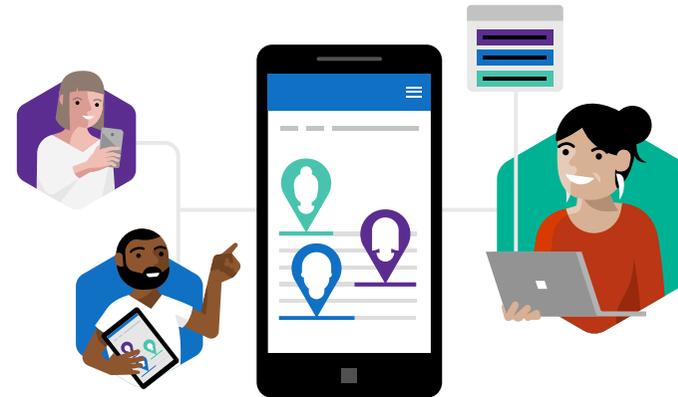
Case Study

Despite the progress that women have made in STEM fields over the past few decades, Harvard's Graduate School of Education believes that a gender gap still exists, and their research suggests that biases might be the root of this gap.

Activity: Class discussion and engagement

Provide a gender bias related story. In particular, relate the story to the age group of the students that you are training. The story is meant to showcase the effects of gender bias and discrimination, with the end positive result of promoting empathy across students. Students are to read the case study, with questions after the reading to facilitate discussion.

Time: 20 minutes



Case Study Example

Emma has been part of the science club at her junior school since she was 8 and recently even led her team into winning a botany competition. On the first day of high school, Emma discovered that the science club in this new school was more advanced in terms of technology. It was focused on Robotics which Emma was really excited about. When she submitted her application to be a part of the science club, she was informed that they could only accept 10 students and that the selection process involved a test comprised of robotics-related questions. Of the 6 girls and 14 boys who took the test, all 10 spaces were awarded to boys. Emma's dream of joining the science club was then shattered.

Q: What should the science club have done to provide an inclusive education?

A: Provide an inclusive education by cutting out the test process and accepting all the students. In the event that there were less robots for students to learn with, encourage the mindset of teamwork and sharing across the classroom.

Q: Was a robotics related test necessary in the first place?

A: No it wasn't, as creativity is at the forefront of computer science. Without creativity, we would not have any ideas or designs for modern technology. Creativity can come from any gender, not just one.

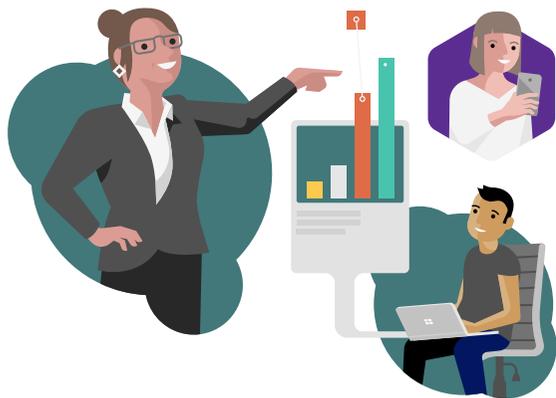
Empowerment Flash Cards for Teachers



I am a change maker



I am positive and approachable



I am empathetic to students of different needs and interests



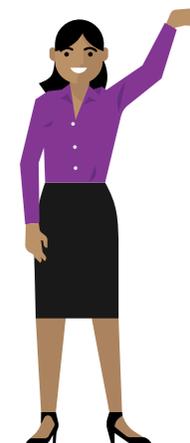
I can empower my students with skills in very high demand

Activity: Take home for teachers and student mentors

Print/Photocopy and cut-out for students.

Time: 10 minutes

"Computer science + my student = A bright future"



Myths vs Facts for Students

Stereotypes are much like mythologies, collective belief systems that condition one to think a certain way. The problem arises when we do not stop to question the validity of these myths. Let's break the stereotype together in the classroom.

Activity: Class discussion

Print/Photocopy and cut-out for students. Walk-through these myths and facts on the first day.

Time: 20 minutes

Myth: Computer science jobs are isolated and uncollaborative

Fold here

Fact: Silicon Valley in California houses many of our world's tech startups to encourage social integration and collaboration between programmers.

Myth: Men make better programmers than women

Fold here

Fact: The first programmable computer was invented by a woman in 1837. She is Ada Lovelace.

Myth: Inborn brilliance is required for computer programming

Fold here

Fact: Computer programming is a language that lets us speak to computers. Just like French or Spanish, everyone can learn it.

Myth: Computer science is for students with strong math skills

Fold here

Fact: Math skills are important for many jobs, but as a computer scientist, you have to be good at exploring new ideas and solving problems.

Challenges & Solutions Statement Cards for Students

<p>1</p> <p>Challenge: Students who rate themselves as being creative and having artistic traits are traditionally less inclined to pursue a career in STEM.</p> <p>Fold here</p> <p>Solution: Many computer science careers require creative thinking, such as turning a small idea into a full-blown website. Emphasize the creative aspects of the computing disciplines and communicate this with prospective students, such as programmatic drawing, animations and stories through computer science.</p>	<p>2</p> <p>Challenge: Students already in arts and humanities disciplines are not attracted into the computer science field.</p> <p>Fold here</p> <p>Solution: Allow learners to develop a different perspective in computer science. This can be done by integrating contexts to make the learning process attractive for both genders, such as focusing on empathetic ideas and the positive impact that technology can make to our society.</p>
<p>3</p> <p>Challenge: Academic and cultural stereotypes can cause barriers to entry and feeding into these stereotypes can keep girls and young women away from computer science fields.</p> <p>Fold here</p> <p>Solution: Break stereotypes in the classrooms on the onset. If misconceptions can be dissected and clarified on the first class, teachers can help students clarify the myths with facts.</p>	<p>4</p> <p>Challenge: Lack of sense of belonging. STEM fields are dominated by men and hence there are a lack of female role-models.</p> <p>Fold here</p> <p>Solution: Teachers to work together to forge a new domino effect – one where girls and young women are more confident to enter the sector as there are more role models in the field that they can associate with.</p>
<p>5</p> <p>Challenge: Women with similar traits to men tend to be hired in the tech industry.</p> <p>Fold here</p> <p>Solution: Teachers can help educate potential recruiters that the recruitment of women in the industry can be relooked. As opposed to hiring women who share similar traits with men, more women can be pulled into the field based on the opportunities for creative, artistic growth and social impact that can result from a computer science degree.</p>	

"A solution exists for every challenge. Let's use computer science to create solutions."

As educators, we need to challenge the current biases and stereotypes regarding the field of computer science. Focusing on solutions can have a positive influence on our students' belief of how well they can succeed in this field. Let's work on these solutions in the classroom through these affirmation cards.

Activity: Class discussion and brainstorm

Print/Photocopy and cut-out for distribution to students. Walk-through the affirmation cards with students and ask for more challenges that students can think off, along with a brainstorming of solutions for the challenges.

Time: 20 minutes

Empowerment Flash Cards for Students



Computer science is for everyone

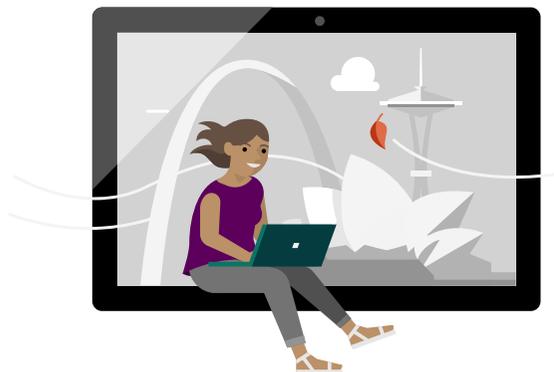


Let's focus on the outcome,
not the codes

Activity: Take home for students

Print/Photocopy and cut-out for distribution to students.

Time: 10 minutes



I can make a difference to my
community



I can solve a global problem

INSTRUCTOR'S GUIDE



Computer Science is for Everyone

Activity Type: Roleplay and brainstorm

Print one, preferably A3 in size to use with students together or create your own on a teaching board.

Time: 20 minutes

My Profession	I Can Learn Computer Science To...
I am a teacher	<ul style="list-style-type: none"> Empower my students with a skillset to increase their employability options.
I am a doctor	<ul style="list-style-type: none"> Find better surgical methods for neurosurgeries.
I am a business owner	<ul style="list-style-type: none"> Understand my customers better through data analytics, thus serving them better.
I am a fashion designer	<ul style="list-style-type: none"> Create wearable technology for customers to shop and preview clothing accessories online.
I am a disabled community volunteer	<ul style="list-style-type: none"> Design a smartphone app, to create user interfaces for those with visual impairments.
I am a	<ul style="list-style-type: none">
I am a	<ul style="list-style-type: none">
I am a	<ul style="list-style-type: none">
I am a	<ul style="list-style-type: none">
I am a	<ul style="list-style-type: none">

Lesson Plan

Now that you have gone through the this toolkit, here is an example of a lesson plan you can use for your students

Lesson		Reference	Timeline
1	Guide students through the Future Ready ASEAN program, including the website flow, sign up, and log-in of the website	https://futurereadyasean.org Learning progress sheet	1 hour
2	Provide a case study example on inclusive computer science education	Case study example	20 minutes
3	Discuss myths and facts with students	Myths & facts sheet	20 minutes
4	Have a class discussion on challenges	Challenges & solutions cards	20 minutes
5	Encourage empowerment	Empowerment flash cards for students	10 minutes
6	Have a roleplay activity	Computer science is for everyone sheet	20 minutes
7	Walk-through the competition	Countdown to competition timelines	10 minutes
8	Guide students through website content	https://futurereadyasean.org/start-learning	Timeline as per website



Glossary

Digital Literacy

An individual's ability to find, evaluate, and compose clear information through writing and other mediums on various digital platforms.

Computer Science

The study of processes that interact with data and that can be represented as data in the form of programs. It enables the use of algorithms to manipulate, store, and communicate digital information.

STEM

Science, Technology, Engineering and Mathematics, a term used to group together these academic disciplines.

Empowerment

Expanding people's ability to take control of their lives and make important life choices.

Affirmation

Refers primarily to the practice of positive thinking and self-empowerment. "A positive mental attitude supported by affirmations will achieve success in anything."

Gender

Refers to our socially constructed ideas about how men and women should be and act, different from our biological sex.

Gender Bias

A preference or prejudice toward one gender over the other. Bias can be conscious or unconscious, and may manifest in many ways, both subtle and obvious.



Acknowledgements

1. "Engaging Girls in Computer Science: Transcending cultural stereotypes & emotional roadblocks", Lorraine A. Tang, Empire Code
2. "The Change-Makers: A young activist's toolkit for ending violence against women and girls", United Nations Secretary-General's Campaign UNiTE to End Violence Against Women
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4. "Equal Access: Universal design of instruction", Dr. Sheryl Burgstahler, University of Washington College of Engineering
5. "Equity in Computer Science Education", K-12 Computer science framework
6. "Microsoft Philanthropies Make What's Next 2019 – Messaging and Supporting Points", Microsoft Philanthropies
7. "For Educators: Gender bias case study", <https://mcc.gse.harvard.edu/resources-for-educators/gender-bias-case-study>, Harvard Graduate School of Education
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9. "The Power of Parity: Advancing Women's Equality in Asia Pacific", McKinsey & Company
10. "Women Employees Boost the Bottom Line for Tech Firms", <https://www.morganstanley.com/ideas/gender-diversity-tech-companies>, Morgan Stanley