IGNITE MY FUTURE

MASTER CLASS VIDEO EDUCATOR GUIDE

OVERVIEW

Introduction

Ignite My Future in School (IMFIS), a program from Tata Consultancy Services and Discovery Education, transforms the way students learn through the use of computational thinking. Much like critical thinking, computational thinking is a higher-level process whereby students can decipher problems and form innovative solutions. Computational thinking combines 21st century technology with key strategies to solve any given challenge. By teaching students to solve problems using the same components as a computer, we prepare them for bright futures where they can combine creativity with computational thinking for ultimate innovation and success. The seven components of computational thinking are collecting data, analyzing data, finding patterns, decomposing problems, abstracting, building models and developing algorithms. Take a journey across three countries in order to see what computational thinking looks like in action. You will discover the basics of computational thinking and how to progress into the aspirational goal of global collaboration. The videos in this collection can be used by individual teachers and/or incorporated into group professional development activities.

Objectives

- Explain why it is valuable to integrate computational thinking across disciplines and age groups.
- Illustrate how educators use Ignite My Future in School resources to help students to use computational thinking in order to break down and solve complex problems.
- Inspire educators to consider how they can incorporate computational thinking into their professional practice.

A Closer Look

Classrooms are diverse environments and computational thinking can inspire problem-solving among students. In this IMFIS Master Class series, you will meet six teachers from across North America. There are two themes that you will analyze, as you consider how to incorporate computational thinking into your teaching practice.

- **Theme 1:** Computational thinking can be used at any age and within *all* subject matters to drive real-world problem-solving skills.
- **Theme 2:** Computational thinking can empower *all* students to solve community and global problems.

Theme 1—Computational Thinking, Across All Ages & Disciplines

Featured Educators

- Emy Aultman, K-5 Library Specialist, G.O. Bailey Elementary School, Tifton, Georgia
  Emy believes that students of all ages can learn to problem solve, using computational thinking. She states that it is never too early to begin preparing students for their future using real-world examples.
- Pedro Delgado, computer science, social studies and science teacher, Young Womens' STEAM and Preparatory Academy, El Paso, Texas.
  Pedro uses computational thinking processes to help students become better problem solvers, in all of his classes. He states that computational thinking strategies belong in all disciplines not just computer science classrooms.

Find more easy-to-implement resources to integrate computational thinking practices into your classroom by visiting **ignitemyfutureinschool.org**

- Jenna Rosienski, middle school science teacher, Franklin Middle School, Janesville, Wisconsin
  Jenna uses IMFIS to inspire her students to become critical thinkers. Jenna and her colleagues participate in cross-curricular collaborations in order to engage all learners.

Real-World Connection—Ignite My Future in Action

The goal of this section is to help you connect with educators and consider how and why computational thinking strategies are used in the classroom.

- Emy Aultman seeks to create a learning environment that prepares students of all ages, for their future careers. She ensures that students use educational 21st century skills, like the 4 C's (communication, critical thinking, collaboration and creativity), to find solutions. She prepares them while teaching terminology, giving students opportunities to collaborate as a team and encouraging all students to never give up while seeking solutions. Emy believes computational thinking can be integrated into all content areas and gives several examples for how to achieve this. To make a shift to this type of teaching, you must often step outside of your comfort zone and begin thinking of what this may look like in your classroom. Emy purposefully uses computational thinking components and vocabulary to ensure that her students are able to problem solve simple and complex tasks. This is a key component in preparing students for their future careers, many that do not exist yet.

  "They don't even know they're actually learning important skills because they are busy having fun."
- Pedro Delgado uses computational thinking to ensure that his students become problem solvers of tomorrow. He teaches students to break down issues, analyze the data, come up with their own conclusions, and communicate solutions to peers. This is a framework that they can use in many aspects of their lives. Pedro prepares students to be autonomous inside and outside of the classroom. He does this by embedding computational thinking strategies in all of his classes. This allows his students to breakdown large problems. You may recognize that computational thinking strategies are something you are already infusing into your classroom now. The next step is to give a structure to the process of computational thinking, to allow your students to work through these strategies. Pedro sees computational thinking as the method that will help them accomplish his ultimate goal: that students feel empowered to change the world.

  "I infuse Ignite My Future and computational thinking in all my classes. Computational thinking doesn't just belong in your computer science class."
- Jenna Rosienski harnesses the power of collaboration in her classroom and across her campus. She recognizes that transdisciplinary lessons organize learning around the construction of meaning, in the context of real-world problems or themes. This practice relies on educators collaborating with one another, in order to allow students to make deep connections across subjects. This creates powerful learning environments that inspire students to think creatively and apply critical thinking skills. Jenna's students are given opportunities to develop models, analyze data, experience productive struggle and celebrate failures. Jenna connects with her colleagues to build lessons that integrate multiple content areas, computational thinking strategies and challenge students to seek solutions.

  "When students work together, they are developing all types of skills to solve a problem that exists in the real world. When teachers come together and merge their ideas, really powerful things happen for students. Students are engaged in solving complex problems all day long and they can see the connection in every class."

Reflect

Now that you have had the opportunity to journey into three separate classrooms, take a moment to reflect on your teaching practice:

- What are the common myths of teaching computational thinking? How does Emy debunk those myths? How could you teach computational thinking strategies in your classroom, in order to prepare your students for their future jobs and jobs that do not yet exist??
- How does Pedro use IMFIS to teach computational thinking? What computational thinking components are already present in your content area(s) and learning environment? How could you make these components more explicit to allow students to solve real world problems?

- How do Jenna's students see the connections in every class? How is computational thinking a transdisciplinary approach? What ways can teachers expand the use of computational thinking strategies on campus?

Resources

The following IMFIS resources can be used to support you as you begin to determine how to embed computational thinking in your classroom:

- Take an in-depth look at each of the seven computational thinking strategies, at your own pace, using these e-Learning Modules.
- Discover standard-aligned, transdisciplinary computational thinking lessons that engage your students in real-world problem solving using the IMFIS in School Curriculum.
- Use IMFIS Curriculum Connectors to learn how to incorporate all seven computational thinking strategies in all subject areas.
- Connect with other educators by joining our global educator community. Sign up to become a IMFIS Learning Leader here.

Look Forward

We had the opportunity to venture inside the classrooms of Emy, Pete and Jenna. Hopefully, you are now beginning to visualize what computational thinking and real-world problem solving looks like in your classroom. Below are some next steps to consider, as you work towards weaving computational thinking into your educational practice.

- Analyze your current practice and curriculum to determine a good entry point for computational thinking, in your practice.
- Introduce computational thinking strategies to your students, using vocabulary and real-world problem solving.
- Attempt an Ignite My Future lesson in your classroom. It is okay if it is not flawless the first time! This is a learning journey for you and your students.
- Connect with your colleagues to collaborate on creating a transdisciplinary or cross-curricular learning experience for your students.
- Join an IMFIS Virtual TECHademy to connect with our Professional Learning Experts and learn how to incorporate computational thinking into your classroom.

Theme 2—ALL Students Can Problem Solve Community & Global Issues

Featured Educators

- Shakirah Thomas, Special Education Reading & History teacher, Jackson Intermediate School, Pasadena, Texas

  Shakirah recognizes that consistent, explicit use of computational thinking strategies benefits all learners. She provides relevant experiences that challenge students to take ownership and make a difference.
- Hugh McDonald, 6th & 7th grade teacher, Sunrise Ridge Elementary School, Surrey, British Colombia, Canada

  Hugh wants his students to reflect on how to address community problems. He gives them expectations but has them propose ideas and develop processes for how they will accomplish their goals.
- Diego Vela, 7th–8th grade classroom teacher & STEM Lab Manager, Colegio Inglés Americano, A.C., Monterrey, Nuevo Leon, Mexico

  Diego Vela believes in continuously learning in order to become the teacher that you really envision yourself to be. He also empowers students to connect to the world outside their classroom and become change-makers in a global community.

Real-Life Connections—Ignite My Future in Action

The goal of this section is to help you connect with educators and consider how computational thinking empowers students to be change agents.

- Shakirah Thomas learns from her students every day. She advocates for consistency, learning and engaging with students in order to take problem solving to next level. She believes that computational thinking is truly valuable for all students because it gives them a roadmap to problem solve. Shakirah's students need a tremendous amount of support in areas like memory retrieval, retention of information, making concepts tangible and concrete. Computational thinking allows her students to break down real world problems and find step-by-step solutions, without becoming overwhelmed. She empowers her students find ways to make a difference in their lives and the lives of other students. Shakirah uses the IMIFS lesson "Smile Starter" to empower her students to start a happiness campaign, at their school. She believes these types of lessons ignite a passion for problem solving and allows students a glimpse at what their future could hold.

  "Computational thinking, if you use it consistently, is very explicit. It's something that's going to become second nature to these kids and it just makes the richness of their education that much more powerful. I use computational thinking in my classroom specifically with my special education students. Critical thinking can be extremely tough for them on a broader scale, so consistent use of CT strategies allows them to tackle issues."

- Hugh McDonald believes computational thinking is a way to engage all learners and make them aware that they can become problem solvers. He says that computational thinking has application points that reach beyond the classroom and in to the community. Hugh strives for students to grasp classroom concepts and take those ideas outside of his classroom walls. IMFIS lessons allow his students to discover how to use computational thinking in a fun, engaging way. His students have learned to break down problems, create algorithms for success, think critically about the world around them and come up with solutions that have an impact. Computational thinking gives students the strategies to tackle an issue, be resourceful, and develop transferrable skills. These are skills that students can apply in the classroom and beyond. Students make connections and begin looking at solving community issues in order to become the problem solvers of tomorrow.

  "I want my students to be thinking to address problems. I give them expectations, have them propose ideas and develop processes for how they will accomplish their goals. I am never surprised by what students come up with anymore."

- Diego Vela encourages his students to dig in to a real-world issue, understand what it means in multiple contexts and through varied perspectives. He teaches all students to collect data so they can analyze data, find patterns and create algorithms for viable solutions. Diego believes teaching students problem-solving components are powerful because most STEM careers require the use of these skills. He believes that the shift to virtual teaching has provided more opportunities: erasing national/geographical boundaries and allowing educators to build lessons in a different way. This virtual environment challenges students to develop stronger communication skills and work together creatively. More importantly, it allows for educators across the world to collaborate on global projects. When students collaborate on a global level, it makes the globe your classroom and brings the world together.

  "I think that one of the most amazing things that this type of environment, is that you have no boundaries. There is no: this is Mexico, this is the United States, this is Canada. The only real language here is education. Students understand that even though they're living here, they can communicate with anyone from all around the world and they can come up with solutions to problems that have been there all the time."

Reflect

Now that you have had the opportunity to journey into three impact-driven classrooms, take a moment to reflect on your teaching practice:

- How does Shakirah's goal of having everyone on campus smiling support the use of computational thinking for her students? What ways can your students start a campaign on your campus, community or district?
- What systems does Hugh put in place to give students ownership of the problem-solving process?

How do we get students to believe they can solve problems in their community? What are ways you can encourage students to think of problem solving outside of your classroom walls.

- How does Diego's "unconventional" teaching style support the use of computational thinking in his classroom? How does this foundation catapult his learners into designing solutions within a global community?

Resources

The following IMFIS resources can be used to assist you in furthering your understanding of computational thinking and connecting with our educator community.

- Join the IMFIS team for a virtual professional learning event and meet other educators from around the world. Register for an upcoming online TECHademy here.
- Learn more about the IMFIS Community and join local/global collaborations.
- Learn more about the impact IMFIS has made on teachers and students from these Impact Stories.

Look Forward

We had the opportunity visit the classrooms of Shakira, Hugh and Diego. Hopefully, you are now are ready to continue your computational thinking journey. Below are some next steps to consider, as you think about what computational thinking would look like when your students are solving real-world problems.

- Consider how to engage *all* students in your classroom.
- Provide various opportunities for students to engage in solving problems within their classroom, school and community.
- Allow students to analyze global issues that do not have solutions, using computational thinking.
- Connect with educators in our learning community to allow students to collaborate with others from across your country and the world. Sign up to become a IMFIS Learning Leader here.