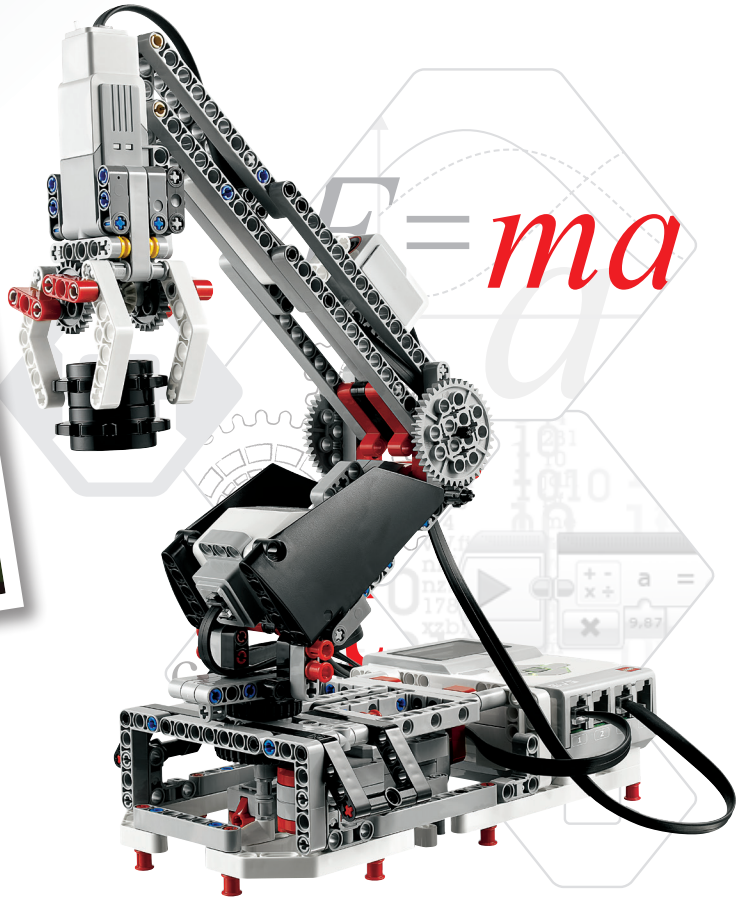
The whimsical life of a LEGO® Education Master Trainer . . .

Master trainers are always on standby, like Bruce Wayne waiting for their Bat-signal. They anxiously await the call that will allow them to spread their knowledge, the chance to share their excitement. This calling wasn't something they dreamed about as a kid; this opportunity was thrust upon them. They chose to accept it and they love every minute.

Meet Henry Kiedrowski, retired teacher by day, master trainer as needed.



LEGO education

About Henry . . .

Henry is a former Supervisor of Educational Technology for East Orange School District in New Jersey, where he worked for 23 years before retiring in 2010. For the East Orange School District, he designed and implemented a sustainable education and technology curriculum across Grades pre-K through 12 in support of New Jersey's Core Curriculum Content Standards. He also authored and put into practice five 3-year Educational Technology plans for the district. Prior to being the Supervisor of Educational Technology, he was the Coordinator of Educational Technology and a middle school computer literacy and science teacher for the same district since 1978.

In 1976, he earned a bachelor of arts in Elementary Education from Trinity International University in Deerfield, IL. He earned a master of arts in Curriculum and Administration from Kean University in Union, NJ, in 1989.

Since he retired, he spends some of his time teaching Microcomputer Applications at Kean University in Union, NJ, where he presents undergraduate students with instruction and practical experiences as an adjunct professor for the past 15 years.

The rest of his retirement is spent conducting training workshops exclusively for the LEGO Education Academy (LEA), for which he has been a certified trainer since 2010 and has conducted over 80 workshops on the US East Coast. His workshops address the LEGO Education solutions from DUPLO® Early Simple Machines through BuildToExpress, WeDo, and LEGO MINDSTORMS® Education robotics.

A few words from Henry. . .

Why did you use LEGO Education solutions in your school?

It was a practical way to create a science, technology, engineering, and math (STEM) program. LEGO MINDSTORMS Education proved to be an essential bridge in the curriculum for students to experience a reason to do visual and cognitive problem solving. It gave students and teachers something that they could apply to what they were learning in math and science by establishing a program of straightforward project-based learning challenges.

How did you become a master trainer for LEGO Education?

While I was the Supervisor of Educational Technology in the East Orange School District (1987-2010), I was responsible for the technology curriculum and the professional development of teachers. In 2008, I introduced LEGO MINDSTORMS Education as a part of the educational technology curriculum for middle school through high school. Part of the monthly professional development for educational technology teachers was to train them to use MINDSTORMS NXT. Just before my retirement in 2010, I came across an opportunity to become a LEA certified trainer. That was over 80 successful workshops ago.

What techniques do you find the most useful when training educators to use LEGO Education products?

Connecting: Using what you already know to understand what you don't know yet.

Connecting with the teachers begins with their rediscovering, building, and creating with LEGO elements. By encouraging them to recall their memories of LEGO elements, I can ascertain their level of enthusiasm and preconceptions about the product. I introduce through discussion that using LEGO Education solutions is not just about building models but also about seeing the relationship of things. Certainly, LEGO elements present sequence and order, and building a model might follow a plan, but when certain principles are in place, you can experiment with how things come together and come up with new ideas.

I explain how I've been able to observe in my grandson's inquisitiveness at play the relationship between play, cognition, discovery, and the application of learning to future challenges. I use an anecdote about his first time on a carousel – how he was more fascinated with the mechanism than the ride – in order to remind the participants of their own inner desire to answer one of life's essential questions: "How does it work?" My intent is to stimulate an intrinsic desire to know how the LEGO Education solution they will be working with "works" and can enhance their teaching of content in the STEM categories.

Constructing: Your hands know more than you think they do.

Every training group begins by building a LEGO duck and/or LEGO tower. After the relationship of play to discovery and problem solving is suggested, these activities require that a limited number of pieces be used to build a solution to a specific challenge in a limited time. Everyone builds, defines, explains, and refines his or her solution (duck) based on his or her own understanding of what a duck is.

I facilitate participants in their sharing of explanations of how they've used their cognitive understanding of ducks to intuitively engineer a duck out of a limited number of LEGO elements in a limited amount of time. All of the ducks are different.

In building the tower, they further expand their experience of "hard fun" and intuitive understanding. Everyone builds his or her own solution to what a tower is. All of the towers are different. Participants build a tower and explain the significance and meaning of their construct.

Both of these activities illustrate planning, doing, and defining at their best. Sequencing becomes something naturally described and shared. In the sharing, the participants become aware of their thought process and those of others. The sharing stimulates new ways of thinking and seeing problems. They learn from each other and how this LEGO solution-stimulated process will help them teach their students.

Contemplating: Observation and storytelling

LEGO Education solutions require a reliance on the imagination, observation skills, and enthusiasm of the participants to tell the story of what they've built and discovered by building it. Questions from me probe for deeper meaning: Why did you do that? What's the significance of that part? How did you decide what to build? With each question, the dialogue becomes richer and everyone experiences the sharing of ideas. Meaning, language, reason, and story take shape through the experience. They learn to listen with their eyes and think with their hands. Whatever anyone has built, there are observations to be made and a story to be told about the experience.

Continuing: Multiple* LEGO Education *building and programming experiences build cognitive relationships and teacher confidence.

Multiple building experiences create a foundation for the rest of the day no matter what LEGO Education solution was purchased for training. My intent is to develop familiarity with all aspects of the product through experiencing what students experience. It is hands-on, minds-on all day. In this way the teachers verify for themselves Dr. Seymour Papert's constructivist learning theories that he referred to as "hard fun." They experience flow theory for

themselves and the importance of intrinsic motivation. They do this as they build from basic models to more complex models. They program them from Make It Move, to Make It Smarter, to Make It a System. Throughout the process, I define terms, model teacher facilitation, and remind them of the process in the hopes of establishing a meaningful framework that is easily transferable to their classrooms.

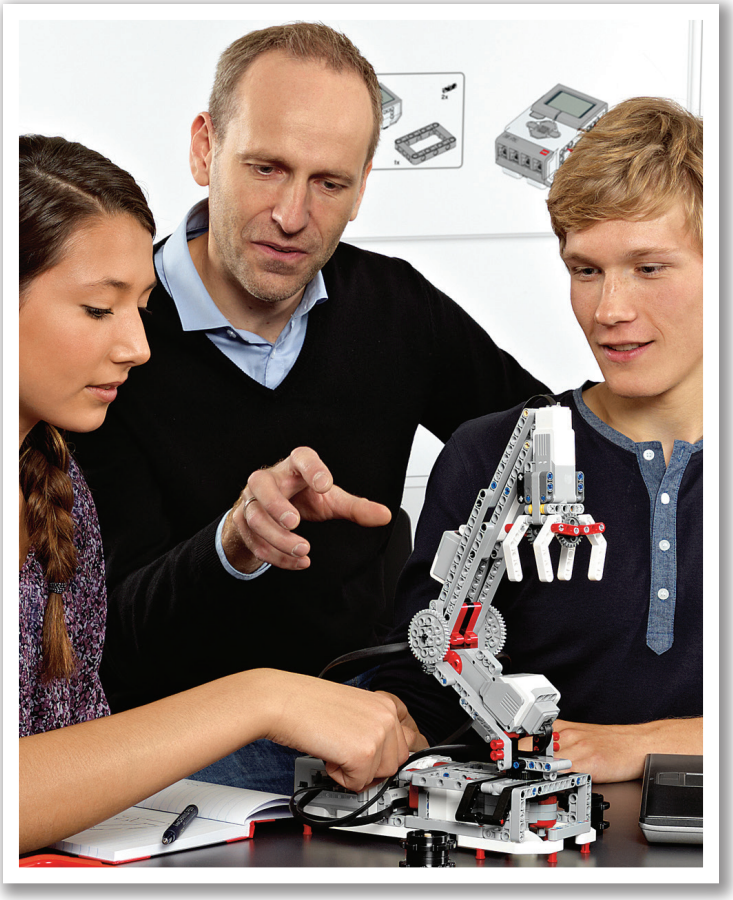
How do you make educators feel comfortable using the LEGO Education robotics platform?

It has to be fun. The duck and tower experiences establish that learning with LEGO elements is fun and that there is a lot to be learned. Constant modeling of the facilitation of the program is essential to creating a comfortable experience. Having the workshop classroom under control and in order establishes the tone for the workshop and raises the comfort level of the educators. It says to them that there is structure to this training, here is what you will learn with this, and this is how you can teach it. I remind them that the two most common types of LEGO builders are organizers and creators. I encourage teachers to organize teams so that organizers and creators are able to "sharpen" each other. The collaborative element of each pair being part of a larger team is essential to grasping an understanding of the modern scientific and engineering environments and careers that STEM curricula highlight.

After we're past any signs of competing and are in flow, then groups move quickly through projects. Participants who see the relationships between the programming elements are encouraged to explain them to and assist others who don't. Those who quickly grasp reading the plans and recognize how to construct with the elements help others with building. Focusing on guiding the participants to connect experientially with the product like this gives them the opportunity to feel comfortable and confident first with the product itself and then with teaching with the product. This has been true in my experience with all the products.

How do you see the LEGO Education professional development offerings helping educators?

LEGO Education professional development offerings enable educators to physically observe the problem-solving process in action. When responding to challenges, participants become keenly aware of the need for process and sequence. What they learn from all the products is that building leads to observation and modification. Constructs grow naturally from complex to simple. Everything has a story and embodies a narrative. Everyone wants to explain what they've built, how it works, and how it can be improved. Many teachers are surprised but quickly embrace the fact that LEGO Education solutions are a great stimulus to language arts and problem solving of all types. When they see in a BuildToExpress training how they can develop BuildToExpress statements for complex situations that lead to deeper meanings, they fully embrace the product and process.



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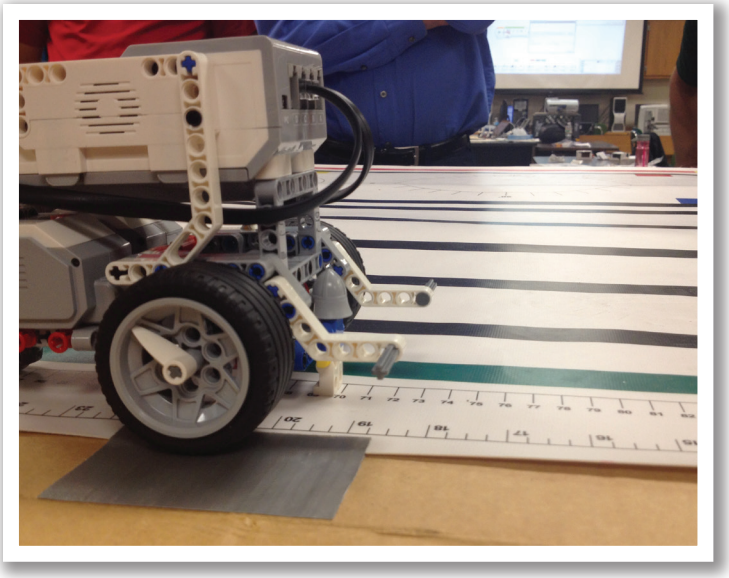

How is LEGO Education's professional development offering different from other training programs?

Professional development from LEGO Education is different from others in a number of ways. Here are a few that come to mind.

- LEGO Education provides customized professional development that meets the needs of the participants where they are. We say, "The hands know more than you think they do," and the quote is proven by every build done that day. Participants grow in understanding and confidence as they participate in everything from building stories to building and programming robots. Their ability to change observation to narrative, process data acquired, and apply it to improve problem solving is a direct result of being in flow and thinking with their hands and listening with their eyes.
- LEGO Education professional development is formative because it provides a philosophical foundation for approaching teaching and learning problem solving through hands-on experiences. It is cross curricular in all experiences as the 4Cs approach incorporates a purpose for reasoned thought as well as verbal and written expression.
- It illuminates that axiom that learning is FUN.
- I'm most enthusiastic about how facts reveal themselves when participants build with LEGO elements. Truths about how to construct good stories, how to apply mathematics, the relationships of things, physics, energy transmission, and sensory response are just some of the things inherent across LEGO Education solutions. Teachers discover them as the professional-development day progresses. They make connections to what they're teaching in their classrooms, and their passion for teaching is ignited and reborn.

What challenges/obstacles have LEGO Education solutions helped you overcome?

As a trainer instructing adults and looking back on my years of teaching experience, I am amazed at how LEGO Education solutions aids in helping others "see" ideas. The challenge of teaching how energy is transmitted is overcome with simple pulleys and gear systems. Seeing fractional parts and using ratio to increase and decrease kinetic energy in gear and pulley systems is an exciting example. When I ask LEGO WeDo workshop participants to count the number of teeth on a small eight-tooth gear and then a 24-tooth gear, calculate the ratio, predict the effects of meshing them, and build a machine that they can program and modify that illustrates gearing up and down, the thrill in the room is electric. "I can see fractions!" someone will exclaim. Then when they continue the activity and modify and improve the build, they truly own the experience and are determined that their students will too.

LEGO MINDSTORMS Education EV3 participants quickly see that a simple go the distance in a straight-line activity involves them in a hands-on, minds-on challenge that requires them to use standard or nonstandard measurements to solve the problem of distance equals rate times time. Some roll their vehicle for one wheel rotation to determine how far that is. Others calculate the circumference of the wheel. Still others simply use trial and error. Multiple problem-solving strategies collaboratively shared lead not only to group success but also to the group's identifying the most efficient method through shared experiences.

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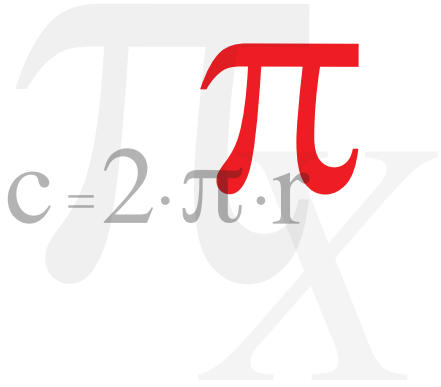
How do educators respond to using LEGO Education solutions?

Here I attempted a mindful free association with words that I've either heard teachers use to describe their experience or that I would use to describe what I've observed when teachers interact with LEGO Education products. The best words to describe how teachers respond to LEGO Education products are:

What would you say to another teacher who is considering taking LEGO Education professional development?

LEGO Education professional development will help you connect with challenges of cognitive problem solving, construct novel solutions to subject-matter challenges, contemplate perspectives that you weren't aware of, and move you to continue on new paths with novel approaches to teaching and learning.



What words would you use to describe LEGO Education?

Perceptive, whimsical, and **problem solving.**

LEGO® Education Academy

For more than 30 years, LEGO® Education has been dedicated to providing educators with complete learning solutions across multiple curriculum areas including science, technology, engineering, mathematics, and language arts. LEGO Education Academy is one way that we strive to support educators by delivering hands-on, in-person product training that enables educators to achieve great success with LEGO Education solutions in the classroom.

The Academy provides customized workshops delivered by certified facilitators who are competent users of LEGO Education products in the classroom. Workshops are designed for educators ranging from preschool through high school who want to get the most out of their LEGO Education products. Experience a motivating approach and discover how LEGO Education solutions enable the educator to become the facilitator of an engaged learning experience.

Why LEGO Education Academy?

LEGO Education Academy workshops:

Promote advancement of 21st-century learning and problem-solving skills. In an emerging technological society, students must elicit analytical thinking skills and be adept at comprehension and problem solving. LEGO Education Academy workshops focus on skills and techniques to develop 21st-century learners.

Enable educators to utilize technology to reach students with a variety of learning styles. Technology is continuously evolving education. Learn effective ways to engage students with technology that is relevant to the 21st century and appeals to students.

Enhance the educator's role as the facilitator of an engaged learning environment. Discover how to facilitate learning, rather than directing a classroom, using LEGO Education solutions.

Enhance the student learning experience Academy workshops help educators and students get the most out of their LEGO Education solutions by providing hands-on training with a LEGO-certified facilitator.

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Benefits of a Workshop

- Participants learn how to integrate LEGO Education resources into the classroom while promoting higher-order thinking, creativity, and problem solving.
- All programs are customizable and tailored to fit specific teaching needs.
- All programs are delivered by certified professionals.
- Every participant receives a LEGO Education certificate of completion stating individual contact hours awarded.

www.LEGOeducation.us

LEGO education