## Inside This Issue




# eSCHOOL NEWS

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# Industry 5.0: Rethinking STEM

**Rob Harvey, For The Win Robotics**

The global workforce is transforming, propelled by the dawn of the Fifth Industrial Revolution–commonly referred to as Industry 5.0. Unlike previous revolutions that focused solely on technological advancement, Industry 5.0 strongly emphasizes collaboration between humans and machines. While AI, robotics, and drones continue to push boundaries, this era also recognizes the importance of human creativity and problem-solving in conjunction with these tools.

As we prepare the workforce of the future, it becomes clear that we must rethink our approach to STEM education. It's no longer enough to teach technical skills in isolation. Instead, we must create learning environments that foster creativity and adaptability–key traits that will help students thrive in an increasingly complex and tech-driven world.

### The imperative for Industry 5.0 readiness

The rise of AI and automation is reshaping industries, creating an urgent need for students to develop technical competencies and think innovatively about how these technologies can be applied. The future workforce must be able

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# Helping K-12 leaders use data more effectively and confidently

**Tatiana Ciccarelli, NWEA**

Autumn is a universally familiar season. Whether you live among the redwoods of the Pacific Northwest, or in the sunny southern states, the cooler air, shorter days, and yellow school buses are all a part of our collective fall. Students are now fully back into the swing of things, and teachers and school leaders have found their rhythm for the year.

With that rhythm comes certain familiar fall routines as well, such as administering the first interim assessment, as well as collecting additional baseline formative and summative assessment data to start the year off as informed as possible. Fall is a perfect time to examine data skills and confidence.

Data is an essential aspect of a school's culture. At the leadership level, data can be used to identify trends, validate conjectures, monitor progress, and check the efficacy of programs and initiatives. At the classroom level, a variety of data should be used by teachers to plan for the upcoming unit, as well as weekly and daily instruction. Similar to leaders, teachers should use it to reflect on differentiation best practices as well as to validate support and certify learning. Students–the most important stakeholders–should be made aware of how data is being used to enhance their learning experience, and collaborate with teachers to develop data based goals that are age and instructionally appropriate.

While you might be nodding your head in agreement, for some school leaders, the above is easier read than done. The same way algebra

**Data, page 7**

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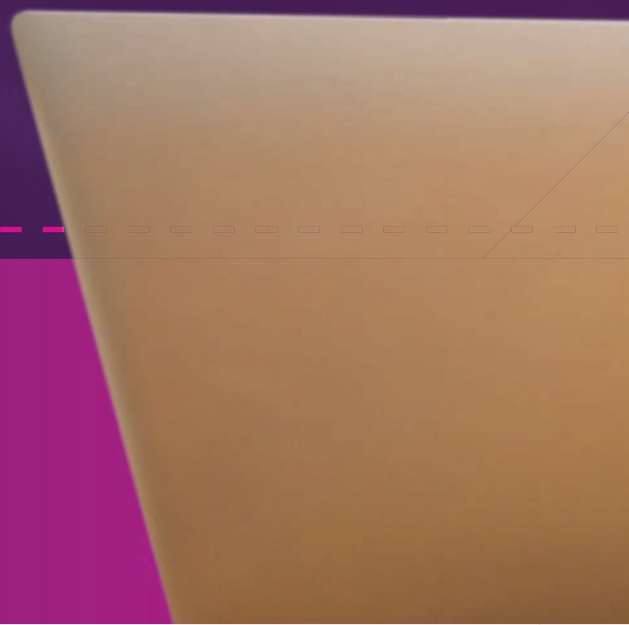

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# Industry 5.0

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to work alongside machines in ways we can't even fully anticipate yet. Anticipating this demands an education system that evolves to meet future challenges–not just by focusing on coding or data analysis but by cultivating skills that will prove invaluable in navigating new, unforeseen challenges.

Hands-on STEM learning is key to this evolution. Rather than confining students to theoretical exercises, integrating real-world technologies like drones into the classroom can provide students with the physical experiences they need to better understand the evolving job market. As these young minds engage with advanced tools, they gain the technical know-how and develop the mindset required to succeed in Industry 5.0.

## Why drones? Connecting STEM to real-world applications

Drones are among the most impactful ways to bring STEM education to life. Unlike traditional teaching methods, drones allow students to interface directly with technology, transforming their learning experiences from passive to active. In classrooms incorporating drones, students can experience real-world problem-solving scenarios that transcend textbook learning.

For example, drones are already playing a crucial role in industries such as agriculture, logistics, and environmental monitoring. By bringing these applications into the classroom, students are provided the opportunity to understand these technologies and explore their potential in solving pressing challenges across industries. Students can learn about everything from engineering and physics to coding and data analysis, all while working on projects with tangible, real-world implications.

Take, for instance, schools that leverage partnerships with drone providers to deploy curricula that include practical lesson plans, like surveying local farmland and analyzing soil conditions to help improve crop yields. These projects go beyond theoretical knowledge, teaching students to apply data analytics in meaningful ways. In another example, high school students can design drones to support healthcare initiatives, like delivering medical supplies to remote areas–projects that mirror innovations currently being explored in healthcare logistics. These experiences prepare students for real-world careers and illuminate career pathways that may not have otherwise been obvious or desirable options.

## Bridging the skills gap with experiential learning

Verticalized skills gaps have become a significant barrier to innovation and economic growth, as many students are graduating without the technical and critical thinking abilities demanded by today's employers. The gap is particularly evident in data analysis, programming, advanced manufacturing, and cybersecurity–fields that are essential for navigating the complexities of the modern digital economy.

This gap continues to widen as technological advancements outpace traditional education methods. In a world increasingly driven by data, students need to learn how to collect, analyze, and interpret information to make informed decisions. Introducing project-based learning centered around data analysis–such as interpreting data sets from environmental studies or designing experiments that involve data collection–gives students hands-on experience in this critical skill area.

As work becomes increasingly global and cross-functional, students must develop the ability to communicate effectively in diverse teams. Experiential learning projects, such as team-based STEM competitions or group technology builds, teach students the importance of working together toward shared goals while honing their communication skills, mirroring the collaborative environments they will encounter in the workforce.

## Incorporating creativity and human ingenuity in Industry 5.0

Technical skills are essential, but the distinguishing factor of Industry 5.0 is the synergy between human ingenuity and machine precision. Our ability to innovate and collaborate with machines to solve complex problems will mark this era. Schools should focus on fostering creativity alongside technical training, as the future workforce will be called upon to design new solutions, lead teams, and tackle challenges that have yet to emerge.

*Experiential learning projects, such as team-based STEM competitions or group technology builds, teach students the importance of working together toward shared goals while honing their communication skills, mirroring the collaborative environments they will encounter in the workforce.*

Schools can consider integrating design thinking into their curriculum, where students engage in iterative processes to ideate, prototype, and test solutions to complex problems. In a classroom setting, students could use design thinking to create smart home devices that integrate human comfort with AI precision, focusing on user-centric solutions.

Entrepreneurship courses in schools

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## Data

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can suddenly present a unique challenge for even the most savvy math student, data can be the obstacle that even the most skilled leader finds themself struggling with. For many it can feel like "too much," and the forest almost always gets lost for the trees.

### Reframe approaches to get over data hurdles

So how do school leader get over data hurdles and reframe their disposition to data? First, do your research when selecting an interim assessment. Be sure you choose the assessment that aligns with your professional ethos, the goals in your comprehensive education plan, as well as your school's data culture. Selecting the right assessment is a lot like choosing an exercise that suits your lifestyle and fitness goals. For some, yoga, with its mindful meditation and fluid movement, is a perfect fit. For others, intense circuit training that pushes you to your limit is just what the doctor ordered.

### Start with expanding your understanding of the assessments that are being used

Next, learn as much as you can about the assessments you are administering. Many school leaders feel they need to have all the answers, or at least appear to, when it comes to data. However, with the time constraints of the role, that can feel like a daunting task that eventually never becomes realized. So commit to learning as much as you can about your school-wide, grade level, and department-wide assessments. While becoming the data expert of your building might be a good goal, start small. Whichever interim assessment you use, become familiar enough with its key terms and metrics and how they can be used to inform instruction and track growth. Be versed in your grade level and department-wide assessments enough to know, generally speaking, the standards being assessed and the ways teachers will use the data in the classroom. This also creates the conditions for more meaningful and fruitful data conversations both with your leadership team and vertically with teacher teams and departments. It is easier to move forward as a school when we're all speaking the same data language.

### Empower your team members to share their data expertise

Don't be afraid to empower your teacher leaders who seem to have a knack for data. Surrounding yourself with a strong data team strengthens the school's data culture and models for students an evergreen best practice: data collaboration. While you're developing your data acumen, learn from those who

speak its language fluently. A diverse data team can help to uncover blindspots and instructional gaps, as well as provide a variety of perspectives on ways to get the most out of your data.

Confidence in data comes from a comfortable understanding, if not fluency, of data, being able to speak to the potential it has in informing instruction, and leading conversations where data implementation is the key ingredient. With a narrow focus and some commitment, what might feel like a mountain now can most certainly become a data molehill before the last autumn leaf falls.

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*Tatiana Ciccarelli is a senior professional learning consultant at NWEA, a division of HMH. A native New Yorker, Tatiana has spent the majority of her career as a teacher leader for the NYC-DOE. Her areas of focus are mathematics and special education. She believes intentional, informed differentiation, an unending curiosity for one's students, and a strong data culture are the keys to success.*

## Industry 5.0

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will empower students to develop tech startups where they identify a societal problem, design a technological solution, and pitch their idea to judges, peers, and even potential investors. This encourages both creativity in coming up with new ideas and collaboration with technology to make ideas a reality.

### The classroom as a catalyst for the future workforce

As we move deeper into Industry 5.0, the demand for a workforce that can blend technical skills with innovative problem-solving increases. Integrating hands-on technology like drones into educational environments offers a dynamic way to address this need. It allows students to connect with STEM fields practically and inspiringly. Educators have the crucial responsibility to provide students with the necessary tools and perspectives. By incorporating creative, physical, and project-based lessons into the curriculum, we foster the innovation, adaptability, and collaboration essential for the future workforce. eSN

*Rob Harvey is a brand builder with more than 20 years of experience elevating unique voices and guiding industry leaders to new technologies. His ability to identify gaps in the market led him to pivot to education, where he recognized a need for better STEM and computer science-based education technology. As executive chairman and cofounder of For The Win Robotics, he pioneered the Build | Fly | Code program and released a first-of-its-kind curriculum to schools across the United States.*

# 3 key opportunities to address education's biggest challenges

A new study reveals key areas of opportunity for addressing the most pressing issue facing educators today: student engagement

**Laura Ascione, Editorial Director, eSchool Media**

While most students say they are eager to learn and say they feel a strong sense of belonging in school, teachers still face challenges that slow improvements in student engagement and learning outcomes, according to a new report from Discovery Education.

Teachers are eager to embrace changes that produce positive outcomes, but major barriers to those outcomes remain, according to The Education Insights Report by Discovery Education.

The report reveals key areas of opportunity for addressing student engagement and captures prevailing attitudes and beliefs from superintendents, teachers, parents, and students.

Three focus areas emerged in the report:

1**. All stakeholders must foster student engagement to motivate curiosity, inspire exploration, and activate effective learning.** Research shows that students who are engaged are more likely to find learning interesting and empowering. Sixty-eight percent of teachers say that getting students excited about learning is a top challenge for them. What's more, almost all teachers and students (94 percent) agree that curiosity is key to unlocking learning, but 80 percent of students say there are not enough opportunities to be curious. Students must be appropriately challenged in their learning, and prioritizing curiosity and exploration can fuel student engagement.

**2. Career exploration and 21st-century skill development are increasingly critical because teachers, parents, and students feel concerned about students' preparedness for the future as the workforce evolves.** When students see how their current studies connect to potential career paths, they are more likely to be motivated and invested in their education. This integration of curiosity-driven learning and practical exploration of future opportunities guides students toward both academic and career success. Sixty-seven percent of students worry that their education is not evolving to meet future workforce needs. Seventy-four percent of superintendents believe student preparedness for job opportunities has improved compared to five years ago, while only 41 percent of teachers agree. As educators work to engage and motivate students, survey findings suggest they must sharpen their focus in two key areas to better prepare students for the future–career readiness and developing interpersonal skills.

**3. Providing more targeted support for teachers and students can increase confidence and improve outcomes.** Studies show that teachers who feel supported are more likely to experience job satisfaction and remain in the profession longer, creating a more stable and effective learning environment for students. Research consistently shows that personalized learning approaches–where

instruction is tailored to students' unique strengths, needs, and interests–lead to better academic outcomes, increased engagement, and higher levels of motivation.

"*While The Education Insights Report* by Discovery Education found that students, parents, teachers, and superintendents have a generally positive outlook about the current state of education, it also found there are hurdles to overcome," said Brian Shaw, Discovery Education's CEO. "Educators have concerns about keeping students engaged, and students feel uncertain about their preparedness for the future. Discovery Education's goal with this research is to spotlight opportunities for improvement so that all stakeholders can collaborate to solve these challenges and create brighter futures for all learners."

Additional findings include:

- **Curiosity is important to everyone.** There is broad agreement on the importance of curiosity in learning, with more than 90 percent of stakeholders surveyed agreeing that curiosity is central to learning. However, 82 percent of students and 75 percent of teachers believe there are not enough opportunities to be curious in today's classrooms.
- **Students want to learn more life skills.** Eighty-eight percent of district leaders, teachers, parents, and students rate life skills as very important, but only 57 percent of students believe their schools adequately teach the life skills needed for future success.

Challenges, page 22

# Baked-in bias or sweet equity: AI's role in motivation and deep learning

**Eliana Whitehouse, EduDream**

In the quickly evolving landscape of AI, education stands at the forefront. New AI tools are emerging daily for educators and students; from AI tutors to curriculum creators, the AI education market is surging.

However, the long-term impact of AI use on students is unknown. As educational AI research tries to keep up with AI development, questions remain surrounding the impact of AI use on student motivation and overall learning. These questions are particularly significant for students of color, who consistently encounter more systemic barriers than their white peers (Frausto et al., 2024).

Emerging in the wake of the COVID-19 pandemic and related declines in student learning and motivation, AI refers to a broad range of technologies, including tools such as ChatGPT, that use vast data repositories to make decisions and problem-solve. Because the tool can assist with assignments like generating essays from prompts, students quickly integrated these technologies into the classroom. Although educators and administrators were slower to adopt these technologies, they have started using AI both to manage unregulated student usage and to streamline their work with AI-powered grading tools. While the use of AI in education remains controversial, it is clear that it is here to stay and, if anything, is rapidly evolving. The question remains: Can AI enhance students' motivation and learning?

A recent rapid review of research concluded that students' motivation is impacted by their experiences in and out of the classroom. The review highlights how student motivation is shaped by more than just individual attitudes, behaviors, beliefs, and traits, but it does not comprehensively address the effects of AI on student motivation (Frausto et al., 2024).

To understand how AI may impact the motivation and learning of students of color, we need to examine the nature of AI itself. AI learns and develops based on preexisting datasets, which often reflect societal biases and racism. This reliance on biased data can lead to skewed and potentially harmful outputs. For example, AI-generated images are prone to perpetuating stereotypes and cliches, such as exclusively generating images of leaders as white men in suits. Similarly, if we were to use AI to generate a leadership curriculum, it would be prone to create content that aligns with this stereotype. Not only does this further enforce the stereotype and subject students to it, but it can create unrelatable content leading students of color to disengage from learning and lose motivation in the course altogether (Frausto et al., 2024).


This is not to suggest that AI is a unique potential detractor. Discrimination is a persistent factor in the real world that affects students' motivational and learning experiences. Similar bias has previously been seen in non-AI learning and motivation tools developed from research that primarily focuses on white, middle-class students (Frausto et al., 2024). If anything, AI merely reflects the biases present in the broader world and the education system. Since AI learns from real data, the biases it perpetuates mirror societal trends. These biases are not mystical; they are direct reflections of our own. For example, teachers also demonstrate comparable levels of bias in the world around them.

When we think about current AI use in education, these baked-in biases can already be cause for concern. On the student use end, AIs have demonstrated subtle racism in the form of a dialect prejudice: students using African American Vernacular English (AAVE) may find that the AIs they communicate with offer them less favorable recommendations than their peers. For teachers, similar bias may impact the grades AI-powered programs assign students, preferring the phrasing and cultural perspectives used in white students' essays over those of students of color. These are just a few examples of the biases present in current AI use in education, but they already raise alarms. Similar human-to-human instances of discrimination, such as from

AI, page 22

# Computer science education sees more investment, but access gaps linger

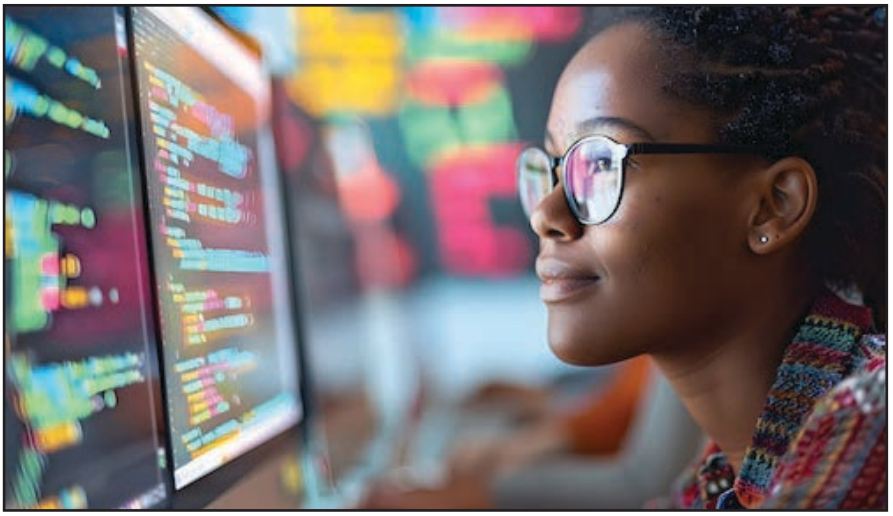
**Laura Ascione, Editorial Director, eSchool Media**

More policymakers are prioritizing computer science education, recognizing the vital role it and other STEM subjects plays in helping students develop workplace-ready skills, according to the 2024 State of Computer Science Education report.

The annual report comes from Code.org, the Computer Science Teachers Association, and the Expanding Computing Education Pathways Alliance and offers a comprehensive analysis of national progress in providing computer science education. It features national and state-level policy and implementation data, focusing on high school data.

Eleven states now require students to earn credit in computer science to graduate from high school. And while the increase in states requiring computer science education is encouraging, millions of students still lack the access necessary to learn, and most states have yet to make it a graduation requirement. With the rise of AI and increase in employers who say AI skills will be a necessary component for workplace success, learning computer science is more critical than ever.

"The data is clear: computer science equips students with essential skills for future careers in all industries. The problem-solving, critical thinking, and collaboration skills gained reach far beyond the computer screen, empowering students in every subject and setting them up for lifelong success," said Cameron Wilson, president of Code.org. "The State of Computer Science Education report shows that while investments and participation in computer science education have grown, the disparities in access are still profound. We need every state to require a computer science graduation requirement."



## State policy adoption

- 39 states have adopted at least six of the ten policies recommended by the Code.org Advocacy Coalition
- States that have at least six policies have an average of 70 percent of their high schools offering foundational computer science, compared with 52 percent in states that adopted fewer than six policies
- Alabama, Arkansas, Indiana, Louisiana, and Nevada have adopted all 10 policies
- In the past year, Alabama, Indiana, and Louisiana all passed a graduation requirement in computer science
- Nebraska funded computer science education for the first time in 2024
- In 2024, state budgets allocated more than $88M to computer science education

## Foundational computer science

- 60 percent of U.S. public high schools offer foundational computer science (up from 57.5 percent last year), but disparities in access persist
- Rural high schools, urban high schools, and smaller high schools (fewer than 500 students) are less likely to offer foundational computer science.
- High schools with more than 50 percent of their students qualifying for free or reduced lunch are less likely to offer foundational computer science.
- Black/African American students, Hispanic/Latino/Latina/Latinx students, and Native American/Alaskan students are less likely to attend a high school that offers foundational computer science.
- 37 percent of middle schools offer computer science (this percentage is based off data received from 68 percent of middle schools–the actual number of schools teaching may be higher)

## Participation in foundational computer science

- In the past year, 6.4 percent of high school students enrolled in foundational computer science classes–if all

Computer Science, page 21

# 4 takeaways for superintendents to drive real change

Visionary superintendents are committed to growth and change that lifts our students out of the status quo

**Neil Gupta, Oakwood City Schools**

Early in my education career, I sat at a conference dinner table surrounded by renowned K-12 leaders. As we discussed our philosophies on leadership, one superintendent's response gave me chills: "My role is to put out fires."

I was inspired and wanted to jump right up from the table and into superhero mode, ready to save the day and my students. That was until another administrator spoke up. "Well, my role is to prevent those fires from happening in the first place."

Her words were transformational for me. The hero isn't always the person in the cape, but the one with the clipboard, planning, organizing, and most importantly, allowing others to stand in the spotlight. I've learned leadership is about using the privilege of our position to build collaborative teams of talented and motivated individuals who can help us stay ahead of any problems and drive innovation that brings impactful change.

I haven't ventured this transformational leadership journey without a few scars and scrapes, but the lessons learned have shaped how I work with others.

**1. Leaders build for the future.** In my first year as an administrator, our district debated how to maximize finances in the face of declining enrollment. For a year, our leadership team crunched numbers and performed a comprehensive facilities study before determining to close one elementary school and reorganize grades by building. We viewed it as a success, allowing for greater efficiency and significant cost savings.

Until it wasn't. As soon as we presented the proposal, we received pushback from the school board, community, and parents–so much so that the project was immediately shelved regardless of the research we had to corroborate our recommendation.

This roadblock taught me that to elevate our districts, leaders must eliminate the top-down system and develop a grassroots mindset that engages all stakeholders. Successful leaders inspire a shared vision, ensure collective ownership of a project, and allocate tasks to those best suited for the work. It's essential to empower and develop others around you to fulfill your mission and ensure it endures even after you move on.

**2. Leaders leverage tools.** Technology can help address chronic absenteeism, personalize learning based on student needs, and strengthen communication with families. But it's not the main character in our schools' story; it's a supporting character, here to assist teachers, staff, and administrators in implementing best practices.

Successful school leaders are skilled at balancing tech integration so that it supports our educators' preferred teaching models rather than stealing the spotlight away from them. One of my most eye-opening experiences was watching a teacher use technology to point out the parts of a leaf on screen rather than taking her first-graders outside to explore the pile of leaves right outside her window–all because the district ingrained in her the belief that technology was a non-negotiable.

In addition, superintendents need to identify AI and tech tools that help support our roles, including digital workspaces that allow for cross-department collaboration, fundraising systems that promote transparency and accountability, and foster communication inside and outside our school doors Just as important, we need to vet and evaluate each one prior to purchase to ensure it fulfills our strategic needs.

**3. Leaders freeze.** As school leaders, we have an inherent drive to innovate so that we may better our students' learning experiences. So, for us, one of the most challenging aspects of moving our districts forward is taking a step back.

According to the three-stage change model developed by psychologist Kurt Lewin, the most effective way to avoid resistance and secure buy-in is to "unfreeze-change-refreeze." Lewin's theory resonated with me when I wanted to integrate more STEM into our curriculum. The process started by "unfreezing" the status quo–auditing where staff stood on current STEM programs, identifying the "whys" behind need for change, such as better preparing students for future careers, and developing a compelling message that energized stakeholders. During the change stage, we strived to empower early adopters and make modifications to the rollout based on their feedback. Once the curriculum updates were successfully implemented, we had to "refreeze" our school back to stability and ensure teachers settled comfortably

Superintendents, page 12

# Students want more career-connected learning

**Laura Ascione, Editorial Director, eSchool Media**

Fifty-nine percent of students say they would like more opportunities for career-connected learning, according to a new report from the New Hampshire Learning Initiative and Gallup.

The report, Voices of New Hampshire Students: Career-Connected Learning's Role in Building Bright Futures, examines the impact of career-connected learning on the more than 8,500 New Hampshire students in grades 5-12.

About half of students say while at school, they learned about a job or career they previously did not know about. Students who have a mentor who supports their development are more likely to be engaged at school (36 percent) than their peers (16 percent).

Fifty-nine percent of surveyed students would like more career-related learning opportunities–especially if those opportunities align with their specific interests in jobs and careers. Just under half (48 percent) of high school students and only 25 percent of middle school students report their school's career-connected learning offerings include the careers they are interested in.

Career-connected learning opportunities can include elective classes, units taught in core classes, career fairs, job shadowing opportunities, internships, and volunteering. Around one-third of students (34 percent) say their career-connected learning experiences have helped them formulate plans for life after high school. What's more, at least half of students who have held an internship or externship (57 percent), completed a registered apprenticeship (54 percent), participated in job shadowing (51 percent), or taken a volunteer opportunity for a job- or career-related position (51 percent) say such activities helped inform their post-high-school trajectory.

Student engagement also increases with career-related learning opportunities. Fifteen percent of students who did not participate in any career-connected activity are engaged in learning, compared to 26 percent of those who have participated in at least one career-linked learning opportunity. Greater participation in career-related activities leads to even higher levels of engagement–45 percent of students who participated in 10 or more activities are engaged, compared to 22 percent among those who have participated in one to four.

"The NHLI-Gallup survey has been a game-changer for districts, providing data that underscores how important career-connected learning is to student engagement and mindset about the future. The data could not have come at a better time," NHLI's Executive Director Ellen Hume-Howard said in the report. eSN

## Superintendents

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into the new routine.

Doing your due diligence as a leader and including stakeholders is how we transform our school culture from compliance to commitment, where everyone is excited to be part of a movement that improves student outcomes.

**4. Leaders develop teams.** In the 1970s, the Vroom-Yetton leadership model was developed to help leaders choose from five decision-making processes based on quality, team commitment, and time constraints. The problem is, as humans, we naturally fixate on the last factor. Instead of being time-centered leaders, we need to evolve into developmental-centered leaders. The more information we have from stakeholders as we work our way through the decision-to-implementation process, the better off our students will be.

Last year, I had to adjust our schools' bell schedule to accommodate a week of state testing. It's basic mathematics–until you dive deeper into the impact a single shift can make. I could have scribbled down a schedule in minutes, but instead, I took a few weeks to get everyone on the same page. I talked to food service to figure out how to fit in all the lunch hours, the bus drivers about the impact of a delayed dismissal time, and career counselors to make sure our students could get to their off-site CTE programs. Devoting that time to team building ensured all stakeholders were comfortable with decisions and frustrations were avoided.

Visionary superintendents are committed to growth and change that lifts our students out of the status quo when it is no longer viable for impactful learning. Ensuring those around you share your dedication requires devoting the time to building talented teams, focusing on the future, and setting an intention for true collaboration district-wide.

As the African proverb says: "If you want to go fast, go alone. If you want to go far, go together." I believe this message needs to drive everything we do in education–when we unite as a team, we create the best opportunities for our students. eSN

*Neil Gupta serves as superintendent for Oakwood City Schools, Ohio. With more than 16 years of experience as a district administrator in rural and suburban settings, he has a passion for leadership, building culture, and coaching leaders.*

# Creating esports programs with managed network services

**Mark Kornegay,**
**Spectrum Enterprise**

Esports programs are continuing to grow in popularity, as evidenced by the widespread adoption by schools across the country. In fact, the global esports market is projected to grow to $4.8 billion by 2030. While esports programs are more commonly found on college and university campuses, high schools and even middle schools have started launching programs.

Participating in esports can help students develop teamwork and leadership skills, and may even lead to scholarship opportunities at certain colleges and universities, according to Scholarships.com. Technology serves as the underlying foundation for any scholastic esports program; however, organizers don't need to have robust internal IT teams–the expertise of a technology partner can help get students into the esports arena.

## Bringing an esports program to life

A modern digital infrastructure is the critical foundation for a successful esports program. In the world of online gaming, a few milliseconds can make the difference between a win or loss–with school pride, prizes, and potentially scholarships on the line. Latency or lag time in a school's internet connection can significantly impact the outcome of a competition. Using a dedicated wired connection can provide optimal reliability and minimize latency. It is also helpful to consider service-level agreements (SLAs) from providers that not only guarantee reliability, but also include strong metrics for performance indicators such as latency. As the esports program grows, the digital infrastructure should be able to easily scale. The increased bandwidth required by adding more players and playing increasingly high-resolution games shouldn't risk affecting other school operations on the network.

The Cannon School, a K-12 school in Concord, North Carolina, has created a successful esports program that serves both as a recreational league and a competitive varsity sport. The school opted for a co-managed system where its service partner installed fiber connectivity and manages the security of the network–unified threat management that includes a firewall, advanced malware protection, and intrusion prevention–while Cannon School's internal IT team manages the content filtering to ensure that students are accessing only age-appropriate websites.

Approximately 60 students joined Cannon School's esports program in its first two years of operating and about half compete on the varsity team. Tram Tran, the school's Manager of Information Technology, credits its popularity to the simple fact that young people love computer gaming. Tran expects the school's esports program to see a surge in participants over the next several years, and the implemented IT solution can easily scale to address the greater number of users on the system, as well as the ever-increasing data-intensive video games.

"With our esports program, we are building this pathway from high school to college and then from college to the pros," Tran said.

## Securing technology as the foundation for esports

Understanding and implementing the technology foundation necessary may be daunting for schools with limited internal IT resources, but working with an experienced technology partner can help. Technology partners not only offer the expertise and guidance needed for implementing an esports program, but also can provide ongoing support–through managed network services–to ensure that network operations are continually monitored and that competitions have the bandwidth needed to run smoothly.

According to the Consortium for School Networking (CoSN) on the 2023 State of EdTech Leadership, nearly half of respondents (45 percent) felt inadequately staffed to plan and implement new technology. Managed network services can offer schools peace of mind by monitoring for network performance and cybersecurity issues 24/7, freeing IT staff from day-to-day troubleshooting. Beyond supplementing staffing resources, managed services also offer the benefit of no upfront hardware ownership costs, and the fixed, regular expense offers predictability for schools' budgets.

## Next steps

For schools thinking about launching an esports program, a conversation with a potential technology solutions partner is a good place to start. An experienced partner can evaluate a school's current IT network services, help identify what is required, and determine a realistic plan and timeline to establish a program. Schools equipped with a robust digital infrastructure can offer students unique opportunities to compete, collaborate, and thrive in the realm of esports, and leveraging managed network services for help with the technology performance can make things easier for the employees who are focused on the program's execution and success. eSN

*Mark Kornegay is Group Vice President, Vertical Markets, for Spectrum Enterprise. A part of Charter Communications, Inc., Spectrum Enterprise is a national provider of scalable, fiber technology solutions serving many of America's largest businesses and communications service providers.*

# New E-rate rules could narrow the homework gap

## Lack of at-home internet access for many students perpetuates the homework gap–but a new E-rate action can change that

**Laura Ascione, Editorial Director, eSchool Media**

Learning is mobile–but how can schools provide reliable high-speed internet for students who need devices at home, but who lack connectivity?

In July, the Federal Communications Commission (FCC) approved the use of E-rate funds to loan Wi-Fi hotspots that support students, school staff, and library patrons without internet access.

For an update on the 2025 E-rate, register for an eSchool News webinar featuring expert insight.

The federal E-rate program provides discounts to help schools and libraries obtain affordable telecommunications and internet access. Over the years, the program has been modernized to focus support on bringing high-speed broadband to and within schools and libraries. This latest action will help students gain access to educational resources that may have been previously out of reach and enable them to learn without limits.

"I believe every library and every school library in this country should be able to loan out Wi-Fi hotspots to help keep their patrons and kids connected. It is 2024 in the United States. This should be our baseline. We can use the E-rate program to make it happen," said FCC Chairwoman Jessica Rosenworcel in a statement.

"That is why today we modernize E-rate to ensure that schools and libraries nationwide can loan out Wi-Fi hotspots to support high-speed internet access in rural America, urban America, and everything in between. The time to do this is now. We do not need to go back; we can go forward and make it possible for everyone to get the connections they need," she added.

According to an FCC announcement, the new ruling will:

- Allow schools and libraries to use E-rate funding to loan out Wi-Fi hotspots and support high-speed internet access for students, school staff, and library patrons in both rural and urban parts of the country.
- Adopt a budget mechanism that sets a limit on the amount of support that an applicant can request for Wi-Fi hotspots and services over a three-year period. In the event that demand for E-rate support exceeds available funding in a given funding year, eligible on-premises category one and category two equipment and service requests will be prioritized and funded before eligible off-premises equipment and service requests.
- Adopt numerous safeguards to protect the integrity of the E-rate program, including measures to ensure the supported Wi-Fi hotspots and services are in use, are used for educational purposes, are not funded through other sources, and are properly documented for auditing purposes.
- Require compliance with the Children's Internet Protection Act.

"We commend the FCC for working to ensure that every student has the opportunity to thrive in a connected world. The approval of this initiative represents a forward-thinking approach to the E-rate program, aligning it with the realities of today's educational landscape," said John Harrington, CEO of Funds For Learning. "Learning extends outside the classroom or library to homes, while on the go, and in every community space. This move empowers schools and libraries to bridge the homework gap, providing students with the resources they need to succeed academically, regardless of their socioeconomic status or geographical location."

Harrington added: "The COVID-19 pandemic highlighted the vital role of connectivity in education, and this decision makes it possible for more students and library patrons to gain internet access. Reliable internet access is fundamental to modern education, allowing students to participate fully in digital learning environments. This is a monumental step towards closing the digital divide and ensuring equitable access to educational resources for all. Funds For Learning is committed to supporting this expansion and will continue to advocate for policies that enhance the effectiveness of the E-rate program."

On June 6, the FCC adopted a three-year, $200 million Schools and Libraries Cybersecurity Pilot Program, which will allow the FCC to obtain and analyze actionable data about which cybersecurity services and equipment would best help K-12 schools and libraries address growing cyberthreats and attacks against their broadband networks.

Through the pilot, the FCC aims to learn how to improve school and library defenses against sophisticated ransomware and cyberattacks that put students at risk and impede their learning.

The pilot will enable the FCC to gather the data needed to better understand whether and how universal service funds could be used to support the cybersecurity needs of schools and libraries and to share lessons learned with our federal partners to jointly combat this growing problem. eSN

# Early screening and intervention are the key to math success

Educators and reading specialists have known for many years about dyslexia, which is why schools regularly use screening tools that can identify students with this reading disability and give them the early intervention they need to succeed.

But there's a similar learning disability that is holding back the achievement of students in mathematics, and it's much less widely known.

Although dyscalculia, a neurodevelopmental disorder that leads to persistent difficulties in learning number-related skills, is estimated to affect 5 to 7 percent of school-age children nationwide–about the same percentage as those affected by dyslexia–only 15 percent of teachers in a recent survey said their students have been screened for this learning disorder, and many teachers have never even heard of it.

As with reading disabilities, early identification can lead to timely and effective support, reducing students' long-term struggles with math and boosting educational outcomes.

**What is dyscalculia?**

Dyscalculia affects a person's ability to understand and work with numbers, which can significantly impact their personal life–and their academic and career success.

Students with dyscalculia typically struggle with critical skills such as memorizing math facts, estimating quantities, remembering the steps involved in solving a problem or a sequence of numbers, and accurately judging magnitude, time, and speed. These problems not only make learning math difficult; they also persist into adulthood, affecting a person's ability to balance a checkbook, plan a budget, be on time for meetings, and perform many other tasks we take for granted every day.

Even using a conservative estimate of 5 percent of the nation's 55-plus million students, this would amount to nearly 2.75 million students–about the population of Kansas–with some degree of math learning disability. Yet, dyscalculia remains dramatically under-identified among students.

One reason for this discrepancy is that it's more socially acceptable to struggle with math than with reading. Think about how common it is to hear someone say, "I'm not a math person," or to make a joke about being bad at math. But we would never just laugh off someone saying they were bad at reading.

## How early screening and intervention can help

In targeting reading disabilities, we've learned that screening and early intervention can be very effective at helping students overcome these challenges and experience success. Schools should be applying these same strategies in math as well.

Screening for math disabilities should happen early on, as soon as a child has difficulty with the early foundations of math development–such as number sense, mathematical reasoning, memorizing math facts, or making accurate calculations. Early identification and intervention can prevent additional struggles that hinder a child's ability to learn subsequent, more advanced math concepts, causing them to fall even further behind.

At least seven states have passed recent legislation requiring schools to identify and support elementary students who are struggling in math. For instance, Alabama passed a law in 2022 that requires screening K-5 students for math difficulties, and Florida passed a 2023 law requiring schools to provide support for students in grades K-4 who show a "substantial deficiency in mathematics or dyscalculia." States with similar laws include Arkansas, Colorado, Louisiana, Virginia, and West Virginia.

The billions of dollars in Elementary and Secondary School Emergency Relief (ESSER) funding that Congress allocated in the wake of the pandemic provides a key opportunity for schools to invest in early screening and intervention tools to help close math achievement gaps. However, the deadline for using this money is quickly approaching.

Unless they are granted an extension, school and district leaders must decide how to spend their remaining ESSER funding by Sept. 30, 2024–or else they risk losing this important opportunity.

## An example of success

The District of Columbia Public Schools is using a free early math screening tool to identify students who may have dyscalculia and give them the intervention they require.

The 10-minute screener provides a scored report that indicates the presence or lack of potential risk factors for dyscalculia and an action plan based on

**Math Success, page 20**

# Simple steps to navigate difficult classroom discussions

**Kim Harding, Van Andel Institute for Education**

At some point in their career, every teacher will find themselves having a difficult discussion with their students. My first took place not long after I began teaching. It involved one of my students coming up to me and (no joke) declaring that eating your boogers made you healthier. This is, of course, nonsense, and I told the student that he should be using a tissue to clean his nose. However, the student refused to concede his point, and we ended up having a very intense discussion about boogers.

This experience actually taught me a valuable lesson. As teachers, we never know when strange, awkward, or controversial discussions will begin in our classrooms. How we choose to respond to these discussions will have a significant impact on our students' growth. If we want to engage these conversations effectively, we need to be prepared. Here are a few simple steps to begin navigating difficult discussions in your classroom.

## Identifying clear purpose

Start your discussion with a clearly stated objective. This allows you to guide the conversation and connect it to your learning goals. It might even help to post the objectives somewhere in your classroom where everyone can see and acknowledge them. While we want our students to embrace their curiosity, these conversations also require structure. Otherwise, it's easy for students to become sidetracked by superfluous ideas.

## Establishing ground rules

Once the objective is set, it's time to establish some ground rules. This can really make or break your whole discussion because students need to be in a place where they feel safe to tackle something controversial. Collaborate with students to create or modify discussion guidelines and ensure that everyone agrees before starting. This will prevent tension during discussions, keep students from talking at each other instead of to each other, and help them focus on the ideas in front of them.

## Provide a basis for understanding

It's important that everyone taking part in the discussion has an understanding of the topic at hand. They need to recognize that people have different perspective and maybe why they have those perspectives. Use readings, videos, or student-contributed materials to establish a shared understanding of the topic. Be sure to encourage students to share key points and distinguish between facts and opinions.

## Create a framework

Take things slowly and begin by posing open-ended questions that encourage discussion without steering towards specific answers. Ask students to consider why some people may have differing opinions on the issue. Does it affect anyone in the class personally? What do scientists or professionals have to say on this topic? Make sure to stay alert and redirect the discussion if it veers off track. Finally, summarize key points to maintain focus and encourage students to write down any questions they may have for later.

## Include everyone

This conversation doesn't have to be a dialogue between you and a single student. If they feel comfortable, invite other students to share their thoughts and observations. It is possible certain students will be more familiar with a topic than others. Not only does this provide an opportunity for diverse viewpoints, but it also encourages students to practice their social-emotional learning as a class. Are they being clear in their communication? Are they demonstrating self-awareness? These things can be just as important as the questions themselves.

## Being an active facilitator

Guide the discussion by rephrasing questions, clarifying points, and ensuring all perspectives are considered. Be mindful of sharing personal views and their influence on student participation. Remember, your students look up to you and respect you (yes, really!). How you respond to these questions will determine how many of them engage with the conversation. It may be difficult, but you need to be a neutral party in this conversation.

## Summarizing and gathering feedback

So, you've done all this work to have a deep and meaningful conversation with

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# How this educator integrates Dungeons & Dragons into the curriculum

**Rob Brant, NewHope Academy**

I grew up in the 1980s, and Dungeons & Dragons (D&D) was a big part of my teenage years. I was definitely a kid who fell through the cracks because I didn't want people to notice me.

As a high schooler with undiagnosed learning differences, who often felt misunderstood, D&D became my escape. It was a way to dive into a world where I could be anyone I wanted, at a time when I didn't feel like I fit in anywhere. Like many parents at the time, mine were concerned about the game's reputation. They even joined a support group for parents of kids who played D&D! Looking back, it's a little funny, but it also highlights how different things were back then.

Fast-forward to 2024, marking the game's 50th anniversary. I'm now an English teacher and case manager at NewHope Academy in Arlington Heights, Illinois, where we integrate Dungeons & Dragons into our curriculum. After a short-lived stint as a musician in my 20s, I knew I needed a plan B, which lead me to a career in education.

I felt a real passion to ensure kids didn't feel like isolated as I did growing up. I've worked at the school for twice-exceptional students–those who are both gifted and have learning or developmental challenges–for nearly 20 years, and having the game be part of my work is a full-circle moment. I'm incredibly grateful for the opportunity to use something I loved as a teenager to support my students today.

NewHope Academy students are bright, imaginative, and full of potential, but they often struggle with social interaction and teamwork. That's where D&D comes in. The game naturally fosters collaboration and problem-solving, skills that can be difficult for these students to practice in traditional academic settings.

D&D was introduced at NewHope by another teacher in 2010 after reading studies indicating that tabletop role-playing games can give people with autism a low-risk way to engage in social interactions. Since then, it has evolved into something much bigger. Today, it's so popular at our school that we offer a Dungeons & Dragons elective and also have an after-school club to help new players get started.

Our students are so completely invested in their characters and storylines that they often don't even realize they are practicing math, language arts, and critical thinking along the way. For example, basic algebra and arithmetic are involved in die rolls, which are reinforced by friendly peer pressure. When students care about the outcome of the game and the events they help construct through their actions, it demonstrates plot elements and arc, seasoned with literary archetypes and tropes. Whether they're calculating ability scores or challenge ratings or writing character backstories, they're constantly learning–without feeling like they're sitting through a typical class.

More importantly, Dungeons & Dragons has helped build a sense of community among our students. As other educators may know, this group of students is typically very averse to working in groups. Many of them struggle with shyness and social connections. Through the game, they learn how to work as a team and support one another. I've watched students who were once introverted and reserved give confident presentations, and I've seen friendships form that might never have existed outside of the classroom.

For me, D&D is more than just a game or pop culture nostalgia; it's a powerful tool that helps my students thrive. When you stop to think about it, it's pretty amazing how many educational goals the game can help students attempt to achieve. It allows them to embrace their creativity, practice essential academic skills, and, most importantly, feel like they belong. For a someone who felt like a misfit as a teenager and as a long-tenured special needs educator, there's nothing more rewarding than that. eSN

*Rob Brant is a high school English teacher and case manager at NewHope Academy in Arlington Heights, Illinois. He is dedicated to making a significant impact on his student's lives and thrives on fostering positive learning environments.*

## Network

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your students. It's time to conclude the discussion in a way that lets students remember what they've learned and lets them prioritize the facts. It's best to end discussions with a summary of key points and allow time for students to reflect in some way–maybe writing, drawing, etc.–on what they learned and to write down any remaining questions that they might have.

Leading students through highly-charged conversations can be difficult, but it's a responsibility every educator takes on the moment they enter the classroom. By meeting their questions with respect, we can help students explore the world around them, and create an environment where they feel seen, heard, and valued. These discussions are how we lay the foundation of our students' future learning. So, let's make sure that we're prepared for anything.

*Kim Harding is a Learning Specialist at Van Andel Institute for Education, a Michigan-based education nonprofit dedicated to creating classrooms where curiosity, creativity, and critical thinking thrive.*

# Beyond translations: Effective scaffolds to support ELLs

Translations can serve as temporary support, but can have negative effects if overused, such as slowing English acquisition and preventing engagement

**Timothy Montalvo,**
**Iona University**

As schools continue to serve an increasingly diverse student body, many educators face the challenge of meeting the needs of English Language Learners (ELLs) in content-rich classrooms. While it may seem convenient to provide instructional materials in students' native languages, relying too heavily on translations can hinder ELLs' progress in developing language proficiency and content mastery.

In a recent faculty meeting at our school led by Director Adrienne Viscardi, we discussed the importance of using morphology and concept circles to deepen students' understanding of academic language. These strategies are powerful, but the conversation highlighted a bigger issue: the misconception that translating content is the go-to scaffold for ELLs. While translations can serve as temporary support, they can have unintended negative effects if overused, such as slowing students' English acquisition and preventing them from engaging fully in classroom discourse.

## Why translations alone aren't enough

ELLs need opportunities to practice English in meaningful contexts. Providing content in Spanish–or any other native language–can create a false sense of proficiency, allowing students to rely on their first language rather than building the skills to access content in English. As a result, students may struggle to participate in classroom discussions, access higher-order thinking tasks, and meet grade-level expectations.

Instead of defaulting to translations, it's important to consider a range of scaffolding strategies that build both language and content knowledge. These approaches vary by subject area but are essential for integrating ELLs into the academic learning process.

## Effective scaffolds for ELLs by content area

### 1. Social studies

Social studies classrooms are vocabulary-heavy and context-dependent, which can pose a challenge for ELLs. Consider these scaffolds:

- **Visuals and timelines:** Use maps, historical images, and timelines to anchor content in visual references.
- **Sentence starters and word banks:** Provide structured sentence frames that encourage ELLs to engage in academic discourse, focusing on key terms and concepts.
- **Collaborative learning:** Pairing students with supportive peers can encourage discussion and understanding of complex ideas.

### 2. Math

Though math is often seen as a universal language, the academic vocabulary can create significant barriers for ELLs.

- **Manipulatives and visual aids:** Use hands-on materials like fraction tiles, number lines, or geometric shapes to illustrate concepts.
- **Step-by-step instructions:** Scaffold instructions with clear, sequential steps. Breaking down complex problems helps ELLs process each part.
- **Vocabulary focus:** Teach the language of math problems explicitly, focusing on words like "sum," "difference," or "product."

### 3. Science

Science combines technical terms with abstract concepts, making it a tough subject for ELLs to navigate without support.

- **Anchor charts and visual models:** Create posters or digital anchor charts to display important vocabulary and concepts.
- **Experiments and demonstrations:** Providing hands-on experiences allows students to observe and understand scientific principles without needing to rely solely on language.
- **Graphic organizers:** Help students organize information visually through charts that categorize processes like the scientific method or life cycles.

### 4. English

In an English classroom, the goal is not just language proficiency but also critical thinking and analysis.

Morphology and word roots: Building from our recent faculty meeting, teaching students to break down words by prefixes, suffixes, and roots can help them decode unfamiliar terms.

Leveled reading materials: Offer different versions of the same text at various reading levels so that all students can engage with the material.

Sentence frames and discussion starters: Provide structured ways for students to enter academic conversations, using scaffolds that allow them to practice complex thinking in English.

## Tier 1 and Tier 2 support

ELLs benefit from scaffolding that is woven into everyday classroom instruction. For Tier 1 support, incorporating visuals, structured notes, and modeling in whole-group instruction can make content more accessible. For Tier 2, targeted small-group instruction can focus on building vocabulary and reinforcing key concepts.

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# Real-life work experiences: The unseen curriculum for high school success

Work-based learning partnerships are not just an add-on to the high school experience; they're a transformative element

**George Philhower, Eastern Hancock Schools**

In the bustling halls of high schools across America, students race between classes, their backpacks heavy with textbooks and their minds laden with academic expectations. Yet, a vital component of education remains overlooked.

Education often lags behind in today's rapidly evolving world, where technological advancements and shifting job markets are the norm. While classrooms focus on theoretical knowledge, they may fail to prepare students for the real-life challenges they will inevitably face. One in six employers is hesitant to hire young adults due to their lack of a strong work ethic and practical job skills, even as they struggle to fill critical labor gaps.

Work-based learning partnerships are not just an add-on to the high school experience; they're a transformative element that can lead to remarkable success. At Eastern Hancock Schools in Indiana, we've successfully engaged with local businesses to build robust, hands-on career and technical education (CTE) programs, as well as develop entrepreneurial and business development curricula.

What we've discovered from feedback provided by both students and employers is that when youth engage in real-world work experiences, they emerge with higher self-esteem, a greater sense of responsibility, and newfound independence, all of which set the foundation for professional and personal success.

## Building self-esteem

Feeling needed and valued at work provides students with an immediate ego boost, according to psychologist Barbara Greenberg; in one study, 70 percent of parents reported a positive difference in their child's self-esteem and confidence once they entered the workforce.

Consider the case of Sarah, an EHS student who spent part of her school day working at an advanced manufacturing organization. Sarah entered the internship as a quiet, unsure high school student but left as a confident young adult ready to tackle any challenge. Through her hands-on experience, she learned job skills, developed a strong work ethic, and thrived in a teamwork setting–each success she achieved and every challenge she overcame ignited her self-esteem. By the time Sarah graduated, she was not just college-ready; she was life-ready.

Real-life work experiences provide students like Sarah with tangible accomplishments. They see the direct impact of their efforts, which is profoundly empowering. It's one thing to score well on a test; it's another to see a project you worked on come to fruition and make a real impact. This kind of validation is irreplaceable and builds a robust sense of self-worth that classroom grades alone cannot provide.

## Cultivating responsibility

Another EHS student, Marcus, worked part-time at a local utility and communications company. Balancing school work with a job taught Marcus invaluable lessons in time management, responsibility, and accountability. He learned what it meant to be relied upon by his employer and colleagues. He saw the consequences of tardiness, punctuality's value, and dependability's importance.

These lessons in responsibility transcend the workplace. They shape character and instill a work ethic that benefits students in all areas of life. Marcus's teachers noticed his improved focus and discipline, which are directly attributable to his work experience. By the time he graduated, Marcus was not just a student with good grades but a reliable young man ready to meet the demands of adulthood.

## Fostering independence

Real-world work experiences also foster independence. When students like Emily, who worked as a receptionist in

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# ELLs

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## Resources for teachers

There are numerous resources available to help teachers scaffold effectively for ELLs:

- **WIDA Can Do Descriptors:** This tool provides guidelines on what ELLs can do at each language proficiency level, offering tailored support strategies.
- **Colorín Colorado:** A bilingual site filled with resources and tips for teachers, offering ways to integrate language and content learning.
- **Understanding Language (Stanford University):** A site dedicated to improving ELL instruction by offering tools and strategies that promote deeper content learning.

## A balanced approach to supporting ELLs

While it's tempting to rely on translations as a quick fix, the long-term goal should be to help ELLs build the skills they need to succeed in English. By implementing scaffolds that differentiate instruction across content areas, teachers can ensure that ELLs are both learning the language and mastering academic content.

Supporting ELLs is a challenge, but it is also an opportunity to create a more inclusive, effective classroom. By using strategies that focus on both language and content, we can help all students thrive.

*Timothy Montalvo is an educator passionate about leveraging technology to enhance student learning outcomes. With over a decade of experience in social studies education, he is dedicated to preparing students for active citizenship in the digital age. He currently serves as a Middle School Assistant Principal in Westchester, NY and an adjunct professor of education at Iona University in New York. He can be reached on Twitter/X @MrMontalvoEDU.*

*Supporting ELLs is a challenge, but it is also an opportunity to create a more inclusive, effective classroom. By using strategies that focus on both language and content, we can help all students thrive.*

# Math Success

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the score. The D.C. Public Schools are using this tool as part of a districtwide initiative called the DCPS Road to Equity & Achievement in Math (DREAM).

"We're taking the lessons we've learned with reading instruction and applying them to the teaching of math," says Chris Neuhaus, manager of curriculum, intervention, and assessment innovation for the D.C. Public Schools.

By screening for dyscalculia, schools can identify students who might need further evaluation to see if they qualify for a formal diagnosis, while also determining which students are candidates for evidence-based math interventions. These interventions include using manipulatives and other multisensory methods of instruction within highly targeted, small-group learning sessions, which have been proven effective for students with learning disabilities.

Early screening and intervention gives educators the data they need to provide students with a clear roadmap for success. By screening students for dyscalculia like they screen for dyslexia and other reading disabilities, schools can address a seriously underdiagnosed learning problem—while also raising math achievement and ensuring that all students learn the foundational math skills they need to navigate life effectively. eSN

*Dr. Chelsi Brosh, Ph.D., BCBA-D is the Chief Innovation Officer and Dr. Sandra Elliott, Ph. D. is the Chief Academic Officer for TouchMath, whose multisensory approach to math instruction helps students develop concrete, representational, and abstract skills.*

## Computer Science

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students took one computer science course in their high school career, we would expect to see enrollment around 25 percent

- Nationally, 33 percent of students enrolled in foundational computer science are young women
- Nationally, Hispanic/Latino/Latina/Latinx students are 1.7 times less likely than their white and Asian peers to enroll in foundational computer science, even when they attend a school that offers it
- Nationally, English language learners, students with disabilities, and economically disadvantaged students are underrepresented in foundational computer science compared to their overall population
- In middle and elementary schools, disparities in participation are less pronounced among most demographic groups

### Empowering the next generation of computer science students

A recent University of Maryland study underscores the importance for all schools to invest in computer science education. The research reveals that offering just one computer science course in high school can increase students' earnings by at least 8 percent by age 24. Notably, the benefits are even more pronounced for low-income students, Black students, and female students.

Despite this research and the momentum that continues to build around the computer science movement, gaps persist for many. Data from this year's report shows that across the country, Black, Hispanic/Latino, and Native American/Alaskan students are less likely to attend a high school that offers foundational computer science. In the last year, young women made up just 33 percent of students enrolled in computer science, even when their school offered the course.

The power of computer science education to unlock opportunity and create economic mobility for students from all backgrounds has never been clearer. This year's Hour of Code, the annual campaign that introduces millions of K-12 students worldwide to coding, is designed to highlight this opportunity by bridging the gap between students' passions and the technology that powers them. Hour of Code is powered by educators around the world who are dedicated to expanding access to computer science for all students, in their own communities and beyond.

"Much of our forward progress is a result of the tireless efforts of teachers who advocate to expand CS and disrupt inequities," said Bryan Twarek, head of research and innovation at CSTA. "While advocacy is not part of teachers' responsibilities, it is so helpful in moving towards our vision of every child prepared for a world powered by computing." eSN

## Experiences

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the central office at Eastern Hancock, take on jobs, they earn their own money and make their own financial decisions. They learn the value of a dollar and the satisfaction of earning their way.

Emily's experience taught her financial literacy, budget management, and the confidence that comes from financial independence. She learned to make choices about saving, spending, and managing her resources–lessons that set her apart from peers who had yet to encounter these real-world responsibilities.

At Eastern Hancock, we take a personalized approach to work-based learning. Each junior and senior meets individually with the principal and superintendent to discuss their future goals. Our work-based learning coordinator then helps make those dreams a reality by connecting students to local employers, guiding them through the application and interview process, and providing ongoing support. By working closely with employers to understand their needs, we match student aspirations with community opportunities–like two puzzle pieces coming together. This comprehensive support helps students thrive both in school and beyond.

### The forward-looking solution: Integrating work experience into education

Imagine a future where high school students graduate with a diploma and a resume filled with meaningful work experiences. These students will be better prepared for college and careers, equipped with self-esteem, responsibility, and independence from real-world achievements. They will enter the workforce not as novices but as seasoned individuals who understand the dynamics of professional environments.

This vision requires a collective effort from educators, parents, and the community to become a reality. Schools must prioritize partnerships with local businesses, create flexible schedules that allow for work-study opportunities, and provide guidance on balancing academics with work. Parents should encourage their children to seek work experiences and support them in these endeavors. Communities should rally around their youth, offering opportunities and mentoring to ensure their success.

Real-life work experiences are not just beneficial but essential. By embracing and promoting these opportunities, we can equip our young people with the skills they need to thrive in an ever-changing world. Let's bridge the gap between education and employment and pave the way for the next generation of successful, well-rounded adults. eSN

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*George Philhower is the superintendent of Eastern Hancock Schools in Indiana, a rural school district just east of Indianapolis.*

## AI

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teachers and peers, have been linked to decreased motivation and learning in students of color (Frausto et al., 2024). In this sense, AI and its biases may become yet another obstacle for students of color; AI learning tools and supports designed for and tested primarily on white students, which yield positive results, may negatively impact students of color due to inherent biases.

For human biases, we recommend anti-bias practices to counteract these perceptions. With AI, we may yet have an opportunity to incorporate similar bias awareness and anti-discriminatory practices. Such training for AI has been a prominent point in the conversation around responsible AI creation and use for several years, with companies such as Google releasing AI guidelines with an emphasis on addressing bias in AI systems development. Approaching the issue of AI bias with intentionality can help to circumvent discriminative outputs, such as by intentionally selecting large and diverse datasets to train AI from and rigorously testing them with diverse populations to ensure equitable outcomes. However, even after these efforts, AI systems may remain biased toward certain cultures and contexts. Even well-intentioned efforts to use AI to support student learning and motivation can result in unintended negative outcomes for underrepresented groups.

While AI-education integration is progressing rapidly, there is still an opportunity to address and understand the potential for bias and discrimination from the start. While the exact impact of AI on the motivation and educational outcomes of students of color is yet to be seen, existing research sets a precedent for bias as a detractor. By implementing AI in education with intentionality and inclusivity of perspectives, and by being aware of potential harms, we can aim to prevent negative outcomes and instead create an AI-powered learning environment that enhances the learning experiences of all students. eSN

*Eliana Whitehouse is a macro social worker with experience in supporting community-based initiatives and research throughout the lifespan. Currently, she is a Research and Evaluation Associate at EduDream, a Latina-founded, women-owned education research consulting firm.*

## Challenges

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- **Teachers see promise in adaptive learning.** Ninety-three percent of teachers believe adaptive learning resources would help students learn more effectively and 75 percent of students say learning at their own pace would increase the likelihood of their engaging with lessons, feeling empowered in school, and more prepared for the future.
- **Time is of the essence.** Ninety-four percent of teachers surveyed reported that they are seeking classroom tools that will give them time back to focus on students.
- **AI tools from education experts are more trusted.** When it comes to Artificial Intelligence, 72 percent of teachers and parents, as well as 85 percent of superintendents surveyed, believe AI-powered customized learning materials are more trustworthy when built by experts in education. In addition, 84 percent of teachers and 90 percent of superintendents believe that as teachers receive more training on how to use AI, it will become a more trusted tool in education.

Survey data was collected by The Harris Poll, an industry-leading research organization, on behalf of Discovery Education in August 2024. It included 1,524 responses from K-12 students, parents of K-12 students, and K-12 teachers and superintendents. eSN

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