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The Dominion Post



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RENAISSANCE ACADEMY

Mon Schools keeps moving toward STEM school

BY JIM BISSETT  
JBissett@DominionPost.com

As you're reading this, Monongalia County Schools is steering itself to a new school devoted solely to STEM — the academic and hands-on studies of science, technology, engineering and math that can lead to quick jobs with livable wages right out of high school.

The district awarded the architectural contract this spring to the DLR Group, which in recent years put up a similar school in Colorado, so it can begin on the Renaissance Academy.

That's the proposed name for the \$72 million showcase expected to command an expanse of land overlooking Interstate 79 near Cassville.

Think Silicon Valley, Mon Schools Superintendent Eddie Campbell Jr. said, with chrome, glass and gleaming lab and workspaces outfitted with the latest technology.

Emphasis on the latter, he said.

"In terms of brick-and-mortar construction," Campbell said, "this will be something the county has never seen."

Ideally, he said, the district will line up marquee names in tech, manufacturing, culinary sciences and the medical profession for sponsorships and mentoring opportunities.

Campbell started talking up the project to the district and Board of Edu-



The Dominion Post file photos  
Becca Flint Clark helps students make their flashlights at Ridgedale Elementary for the 4H STEM program.

cation members in 2020, right before the pandemic hit.

Before that came the property purchase.

If all works with the site, the Renaissance Academy will occupy the 150 acres the district bought for \$1.5 million with the expressed purpose of new building construction sometime in the future.

Now, like a science fic-

tion novel come to life, what was the future is now resting in the here, now and almost there.

The project, though, has been driven by some futurist speculation, which is what the county's Comprehensive Educational Facilities Plan — everyone in the district office calls it the CEF — does every 10 years for its renewal.

In many ways, the CEF,

as said, is a paradigm-shifting dice roll.

Or, a visionary owner's manual.

Either way, Mon Schools has been successful with its CEF doings over the years — the last 23, in particular.

The 2000-10 document called for the construction of a new University High School, and you can see that result at its sprawling campus on Bakers Ridge.

Every day is Earth Day at Eastwood Elementary School on the Mileground. The county's only certified green school, made solely from organic and repurposed materials, was the star project of the CEF's 2010-20 update.

Now comes the Renaissance Academy.

Call it a tech-magnet school, Campbell said, for UHS, Morgantown High

and Clay-Battelle.

As said, students from Mon's three public high schools would rotate in and out for detailed instruction, say two or three times a week, without reconfiguring their traditional schedules and putting some classes on hold for the fall or spring terms, as is the case now.

In the meantime, the district's existing Monongalia County Technical Education Center on Mississippi Street would undergo an age-appropriate makeover to offer such instruction geared to middle-schoolers.

Campbell said he likes the balance the STEM school is sure to bring.

Tech center students regularly bring home top trophies in national competitions, and Mon is already one of the state's top-performing school districts, regularly sending its seniors off to the Ivy League and other marquee institutions after they graduate.

"The Renaissance Center is just to add to what we already do well," he previously told The Dominion Post.

Same for Mon BOE President Ron Lytle, who likes the symbolism of a visionary school — being able to be spied from a busily traveled highway.

"It's a beacon."

TWEET @DominionPostWV

SCHOLARSHIP

HOPE gives families a choice in education

BY JIM BISSETT  
JBissett@DominionPost.com

Was it a matter of school choice — or a fight over the fidelity of West Virginia's Constitution?

As it turns out, the Hope Scholarship was both during the autumn of 2022.

That was then.

Today, the measure that allows families a say in where and how their children will be schooled is just part of the state landscape, newly navigated though it may be.

Families that qualify receive a voucher of more than \$4,300 — the current State Aid Formula spent on public education here — that they can then use to enroll their children in charter schools or private institutions of learning.

The outlay can also be used for expenses for

home schooling.

At the core of the initial argument, though, was the issue of public money being used, in effect, for private education.

That's the debate that percolated through the courts for nearly two years.

The scholarship was tossed in Kanawha County Circuit Court in July 2021 due to the public money-private school concerns.

In her dismissal of it then, Kanawha Circuit Judge Joanna Tabit said the scholarship failed to provide "a thorough and efficient system of free schools" for all.

Proponents, though, said generations of West Virginia families — in a state where poverty generally prevails — have been denied that opportunity to

simply have a say in the educational matter.

When the appeal when to the state Supreme Court last fall, justices agreed — but not unanimously — overturning the lower ruling by a 3-2 margin.

In Monongalia County, the public district initially lost around \$2 million in the aid formula, as a number of students opted for the West Virginia Academy, the state's first brick-and-mortar charter that welcomed its inaugural students last fall in a former research building.

Mon Schools has a current operating budget of \$145 million, which gives the district a fiscal foothold some district's don't have.

Even so, Superintendent Eddie Campbell Jr. said, \$2 million is still \$2 million.

"It's not like a fund we're

sitting on," he said. "Every dollar is accounted for."

In the end, however, he was pragmatic about it, saying the scholarship is an avenue of choice for families.

The state Board of Education said the same, with L. Paul Hardesty, board president, pledging a renewed commitment for public education, especially in the shadow of flagging reading and math scores.

A national assessment last fall showed the Mountain State down, and most other districts down across the U.S. as well.

"Student achievement," he said.

"It's time for the West Virginia Department of Education to focus on the basics."

TWEET @DominionPostWV

IN MONONGALIA COUNTY, THE PUBLIC DISTRICT INITIALLY LOST AROUND \$2 MILLION IN THE AID FORMULA, AS A NUMBER OF STUDENTS OPTED FOR THE WEST VIRGINIA ACADEMY, THE STATE'S FIRST BRICK-AND-MORTAR CHARTER THAT WELCOMED ITS INAUGURAL STUDENTS LAST FALL IN A FORMER RESEARCH BUILDING.

LEARNING

NYC to start school for dyslexia, screening program

Associated Press

NEW YORK — New York City will grow its smorgasbord of dyslexia initiatives this fall — from the first district school explicitly for students with the learning disability, to screening detained or incarcerated students for difficulty reading.

South Bronx Literacy Academy was approved by the city's school governing body, the Panel for Educational Policy, in April. The initiative expands on a dyslexia pilot program at P.S. 161, part of a \$7.4 million investment in screeners and literacy services this school year, but will open as a full-fledged school this September.

For many parents who led the advocacy for a district school designed for reading challenges, the vote was historic. Weepy families shared their experiences finding an appropriate program for their own children with dyslexia, which often entailed costly evaluations and private programs, and tears and temper tantrums while they struggled in school.

"I realize that I am able to tell you these stories now, because I was fortunate enough to get my son to a school that did teach him to read," said Emily Hellstrom, co-founder of the Literacy Academy Collective and mother of a son with dyslexia. "Within the first week, he was a changed person."

"But I also know that my son is the exception — that before today this kind of education was only available to a very privileged few," she said.

SEE DYSLXIA, I-8

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CHARTER SCHOOL

# W.Va. Academy offers different ways to learn

BY ALISE CHAFFINS

Newsroom@DominionPost.com

As she walked through the halls of West Virginia Academy, Morgantown’s first public charter school, student services director Heidi Treu got lots of hugs and high fives from students passing by.

West Virginia Academy opened its doors in August 2022. It is temporarily located in a simple white brick building behind Suburban Lanes. Currently, the school offers classes for grades pre-K through ninth, with plans to add classes through 2026, when the first group will graduate. There are currently about 350 students, with plans to grow to around 400 next year.

The school follows a modified year-round schedule, with nine-week terms that are broken up with longer breaks. The breaks allow students the opportunity to focus on athletics, gifted programs and art projects. During the most recent break, students worked on the musical Mary Poppins.

“It’s been really fun for us because we get to offer all of that extra programming all throughout the year,” Treu said.

Students follow a different learning schedule as well. Treu described it as “bell to bell learning” on Monday through Thursday with both level learning and grade learning. Students are assessed for their level upon enrollment and again at the end of every nine weeks. Students who are behind or beyond their grade level receive about an hour of education in the mornings that is focused on their level. Then in the afternoons, they do grade level learning that includes



William Wotring/The Dominion Post

West Virginia Academy, along Chestnut Ridge Road, is the first brick-and-mortar charter school in Monongalia County. It operates on a modified year-round schedule.

basics such as math, English, science, history and also specials like art and music.

Fridays are reserved for more hands-on events, including intramurals, assemblies, field trips and experiments. On the day we visited, one team was working on a science experiment out on the playground in preparation for their upcoming science fair. The students didn’t have the success they were hoping for, but they were still excited when they came back into the building, talking about the ways they could adjust the process to make it work.

While charter schools

are subject to the same assessments that West Virginia public schools are, there are some different offerings at WVA. Students begin learning cursive in kindergarten and practice that until fifth grade. Additionally, students are required to take two years of Latin. Students also primarily do pencil and paper work, rather than working more exclusively on chromebooks.

Lifetime learning is something that Treu feels strongly about, so in addition to Latin and cursive, there are other lifetime learning opportunities. Students all learn the piano in a technology lab with

software that has everyone working on the same song, but at whatever level the student is at. The school also received a grant that allowed it to purchase bicycles, so every student is taught to bike. They also have swimming classes, so every student can learn to swim.

Students at WVA are bused in from both Monongalia County and Preston County in transportation provided by the school, something not every charter school is able to provide. Lunch is also provided to students for \$5, including food from Subway, Chik-fil-A, as well as pizza, and two days of a more typical

school lunch meal.

Although the school includes students from pre-K to ninth grade, there is a clear division between the primary and the secondary classes so that the students are separated. Older students may be invited to the younger classes for interviews or to read aloud to the younger students.

Students also participate in Ambassador teams that teach four virtues: Constantia, which is learning to be resolute, Industria, which is learning to be industrious, Justicia, which is learning to be just, and Salubritas, which is learning to be healthy.

Students rotate teams

STUDENTS ALSO PARTICIPATE IN AMBASSADOR TEAMS THAT TEACH FOUR VIRTUES: CONSTANTIA, WHICH IS LEARNING TO BE RESOLUTE, INDUSTRIA, WHICH IS LEARNING TO BE INDUSTRIOUS, JUSTICIA, WHICH IS LEARNING TO BE JUST, AND SALUBRITAS, WHICH IS LEARNING TO BE HEALTHY.

each year to be immersed in that virtue.

In order to attend WVA, students must enroll prior to the cutoff in February. If space is filled, there is a lottery to determine who is able to attend, while other students are placed on a wait-list.

When asked about where they see progress the most, Treu replied, “I have noticed a huge difference in our students. Some students were reading two to three grades lower. And due to the programs that we have, I’ve had parents say, ‘My child was reading over break and they never do that.’ We’re training leaders.”

Bryce Fordyce, a teacher at WVA, echoed Treu’s comments. “Kids are stepping up and embracing school, wanting to come to school. When the kids are off for two to three weeks, they come back excited. They want to be here.”

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PROTECTION

Safety a top priority for Mon Schools

BY ERIN CLEAVENGER  
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As school safety continues to be an important issue across the nation, Monongalia County Schools is continually working to improve school safety each and every year.

Most recently, weapons detectors were added in the county's three high schools. Every student at the high school level is required to walk through a device prior to going into the school building for the day to determine if they have any type of weapons on them that need to be confiscated as they go through the door.

Adam Henkins, director of Safe Schools, Athletics & Title IX for Monongalia County Schools, said there was initially a small learning curve on how to get hundreds of students through the doors in time for classes to begin as scheduled, but staff members have worked to make the process easy and efficient.

"They have worked out very well," Henkins said. "The staff members at our three high schools have worked really well with the administration."

"It gives the students, the staff members and the community members a feeling of security. They can see we're taking additional steps, and it's just another level of security that we've added to what we already currently had in place," he said.

Another safety addition to Mon County Schools is not a physical component like the weapons detectors, but deals with more of the social and emotional aspect.

"Anytime something with some type of threat, or some type of violence, or some type of alarming situation that may occur with a student, we do what's called threat assessments now with students," Henkins explained. "We have our administrators at all of our high schools, middle schools

and elementary schools to work on threat assessments with students."

Henkins said during a threat assessment they will determine the seriousness of the threat and what actions need to be taken with the student or students in question.

"What it really goes over is the history of the students and looks at different aspects of the student and helps to get a better idea of how to communicate with the parents and work through any type of situation that may arise or any concern that may arise with the student," he explained. "Plus, it allows us to put additional resources into place to work with the families in situations like that."

"So not every threat is a substantial threat. Sometimes there is a transient threat and we can work through that process as well."

Henkins said the schools also work very closely with

local law enforcement agencies like the Monongalia County Sheriff's Department, Morgantown Police Department and the Monongalia County Emergency Management Agency that handles the county's 911 calls to ensure open lines of communication during any possible emergency situations.

When several schools across the state, including Mon County, were the target of a "swatting hoax" last year, Henkins said as soon as the threatening calls started coming in they were able to communicate with law enforcement and make sure they were all on the same page and — if it was something that would occur — how they would communicate with each other.

He said staying in communication with local law enforcement agencies and community agencies really helped in that situation.

"The State Department

requires that all of our schools have crisis plans in place that address any type of situations that may occur and how we would handle that here and who communication goes through," Henkins assured. "We have very well-drawn-out plans and action steps that take place in case something like that would occur."

In addition to the State Department's crisis plan, Mon County schools are also working through Gov. Justice's Safe Schools Initiative.

"We are working with a retired state police officer that is kind of coming around to all of our schools ... to basically give us a safety analysis on our schools and things that we need to improve on and things that we're doing very well," he said.

For instance, the former officer will make sure school entryways are secured and doors and windows are numbered to help identify an accurate floor plan.

"Those have gone very

**MON COUNTY SCHOOLS ARE ALSO WORKING THROUGH GOV. JUSTICE'S SAFE SCHOOLS INITIATIVE.**

well, and we've done exceptionally well with the feedback we've gotten," Henkins said. He also mentioned the county was a bit ahead of the game after working with an outside agency to do a safety analysis on all Mon County schools maybe five or six years ago.

"And so, it's just making sure we're trying to figure out where and what we can continue to work on," he said. "And we have our security — our school resource officers in our middle schools and our three high schools — and we continue to build on that. We're continuing to add those to our elementary schools as well when we get a chance."

**TWEET** @DominionPostWV

EDUCATION

Parents can help kids improve learning, test scores

BY LISA ELLISON  
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The pandemic left a mark on most lives in many ways, including students in the West Virginia education system.

Nationwide learning loss and lack of new learning has been reported. Test scores were historically low in reading and math.

Monongalia County topped the scores in West Virginia. However, state students scored as average in the nation.

MetroNews.com's Brad McElhinny wrote about this downturn in October 2022, when Amy Nichole Grady was named the Senate's new Education Committee chair. Grady had described The Nation's Report Card as "terrible," with the National Assessment of Educational Progress showing results well below the national average and West Virginia's worst performance ever at that time. West Virginia public school fourth graders averaged 226 in math, with a range of 0 to 500, and reading scores even worse at 205. Eighth graders at the time had an average math score of 260, and average reading score of 249 in the same national test administered to students in 10,970 schools, according to McElhinny.

Only part of this performance could be attributed to the pandemic, since the 2019 assessments were similar. For instance, the 2019 national test showed West Virginia scoring near bottom for fourth graders in math and reading. Residents or interested parents may find assessment data, like test results, online at the West Virginia Department of Education's website, WVDE.com.

Data from the West Virginia Alternate Summative Assessment in Grades 3-8 and Grade 11 were said to be "... an important tool that helps the WVDE support counties to address student learning and ongoing recovery from the COVID-19 pandemic."

L. Paul Hardesty, WVBE president, noted, "Some of these proficiency rates are not acceptable. We must get children back to higher levels of proficiency. We were working through these challenges before the pandemic, and now we face greater difficulties in a multitude of areas," Hardesty said. Districts and schools in West Virginia are using the assessment information to address student recovery in education.

West Virginia counties have suffered in academic scores due to other disasters and emergencies. In July 2022, efforts were also made, like extending the Lincoln County State of Emergency for six more months to help reach key compliance in several programs. This included Individual Education Plans (IEPs), Board-approved Comprehensive Educational Facilities Plans (CEFPs) and supporting the Board of Education leadership in these efforts.

The WVDE Office of Accountability had concerns in Lincoln County regarding decreased math instruction time, students struggling to pursue college and technical pathways simultaneously and large classes of 30-36 students at the high school. Though Hardesty found the data concerning, no additional actions were taken in Lincoln County.

There was also a Special Circumstance Review by the Office of Accountability in Jefferson County Schools in June 2021. This review focused on counseling services for improvement in several areas. These included meeting with each student at the high school to review IEPs, making students aware of their full schedule for the upcoming school year, giving staff additional training, increasing technology to reduce or extinguish administrative mistakes and expanding counseling services and personnel.

Gwen Dewar, Ph.D., shared suggestions in 2019 that could help prevent learning loss during school breaks.

Dewar advised parents to engage students in "summer time reading, math games and hands-on STEM activities." She noted that benefits extend beyond academics and students would be stimulated while having fun.

Dewar noted the learning loss in other countries and that kids may lose from 25%-50% of their academic-year gains in math, or more than two months' worth of knowledge, during summer break. Learning loss was also noted in language

SEE SCORES, I-7

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SCORES

FROM PAGE I-6

skills, including reading, writing and spelling, though less dramatically than in math.

Researchers concerned about this have made various proposals over the years, including year-round school with several shorter vacations during the year. There is no targeted date or approval for such a change as yet.

However, Dewar has offered several actions.

1. Get started on a summer reading program, and make sure your child is reading books that are both interesting and challenging. Local librarians can get parents and students pointed in the right direction for summer reading.

2. Parents can consistently review mathematics concepts with their students periodically during the summer to improve long-term retention of learning. This does not have to be daily, nor does it have to be tedious for either student or parent.

To help with motivation, there are a number of educational computer games and apps that make practice fun. Dewar previously suggested using a free app called Bedtime Math. Families using it daily found it to be helpful.

3. Use board games that can help younger students understand numbers and basic operations like addition and subtraction. Dewar noted some children's books can help them to visualize math ideas.

4. Games and construction play with blocks that use strong spatial skills can

help students have better math and science performance. For example, parents can help students predict how given shapes will look when they are put together, or help them solve basic algebra.

5. Dewar suggested engaging students with museums, zoos and nature sites. However, merely attending is insufficient; parents need to help children have hands-on experiences and family conversations. For instance, parents can ask students follow-up questions about these outings. At a later point, parents can ask students what they recall about those experiences, too. Learning can be stimulated when kids are asked to explain.

6. Choose science, technology, engineering and mathematics (STEM) camps with hands-on learning during the summer that emphasize informal, hands-on learning.

7. Dewar suggested that summer camp costs need not be prohibitive, as parents can create their own for their students. For instance, she indicated that there is a nonprofit called Reading Rockets where free materials are accessible. This program helps students learn about rivers, ecosystems and drinking water management.

8. Finally, Dewar commented that students' curiosity is a motivator in learning. Children can be allowed to explore non-standard curriculum or interests.

TWEET @DominionPostWV

WVU

Research: Students with disabilities will benefit from app-based learning

WVU Today

After COVID-19 moved classes online in 2020, a West Virginia University expert in adapted physical activity discovered that apps aren't created equal when it comes to accessibility.

Even so, Samantha Ross, an assistant professor in the College of Applied Human Sciences, knew apps like Chrome or YouTube could still benefit users with disabilities, delivering multiple alternative ways to access information, from screen readers that turn written words into spoken language, to closed captions that convert spoken words into text. And once schools reopened classrooms, she observed that apps continued to be a big part of how K-12 teachers engaged classes.

Ross now ensures the undergraduate students she prepares for careers as physical education teachers understand how to choose classroom apps that enhance learning for all students, including those with disabilities such as dyslexia, low vision or hearing impairments.

Her paper in the Journal of Physical Education, Recreation and Dance offers physical educators — and all teachers — a practical toolkit for evaluating app accessibility and for implementing features such as closed captioning, keyboard navigation or text enlargement in the classroom.

"After the pandemic moved classes online, gym teachers started using Zoom and other technologies to lead their physical education classes," Ross recalled. "I saw creative

strategies, like scavenger hunts, that involved students participating in short exercise bouts within their homes."

However, watching and evaluating students' engagement in front of computers was different from monitoring activity in a classroom.

"For one thing, the kids hardly ever stayed in the video frame," Ross said. "It was a huge challenge, not just for physical education teachers, but for every teacher. Faced with that challenge, many educators found that, when designed well and used thoughtfully, apps could enhance the learning experience for everyone and provide an alternative format for evaluating student performance."

Ross researched two free education apps, Flipgrid and Padlet, which cre-

ate private digital spaces where teachers share activity and discussion prompts. Students post content in response to those prompts and each other's posts. She found that Flipgrid and Padlet omit major accessibility features, raising barriers to learning for students with disabilities.

For example, neither enables adding "alternative text" that describes an image, preventing students with vision impairments from getting audio descriptions of pictures.

Even existing features can be tricky. For instance, auto-captioning features for most apps produce inaccurate transcriptions of video or audio posts when the speaker has a speech impairment, accent or is in a noisy space.

SEE LEARNING, I-10

CALIFORNIA

Bill would boost teacher pay by 50% over 7 years

Los Angeles Times (TNS)

A California lawmaker introduced a bill that would raise salaries for teachers and other school staff by 50% by 2030, the latest legislative effort to tackle a worsening shortage of educators across the state.

The proposed measure, AB 938, would create funding targets under the Local Control Funding Formula and would require school employers to report changes in salaries over the next seven years.

"We need to pay our

teachers and essential school staff what they deserve," Assemblyman Al Muratsuchi (D-Torrance), the bill's author, said in a news release. "Schools across the state are facing a workforce shortage, with many teachers and school employees unable to afford to live in the communities they work in. Moreover, there is a growing wage gap between teachers and comparable college graduates in other fields."

Muratsuchi chairs the Assembly Education Committee.

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READING

# With a generation’s literacy at stake, WVU joins schools and communities to combat COVID-19 learning loss

WVU Today

A statewide education initiative is bringing West Virginia University literacy consultants together with local schools and communities to reverse pandemic-driven early learning loss.

Experts say plummeting reading scores are partially linked to the virtual, learn-from-home model adopted when COVID-19 shuttered schools. Now, the WVU West Virginia Public Education Collaborative and the College of Applied Human Sciences’ School of Education are involved in efforts to resurrect literacy proficiency.

Two programs supported by WVPEC’s Sparking Early Literacy Growth initiative have based their approaches on reaching beyond classroom walls, forming partnerships to support struggling students.

**A double dose of learning in Weirton**

In 2020, literacy scores plunged in Weirton. But in 2021, after the Read with Me Weirton program launched an afterschool and summer tutoring intervention, reading and writing proficiency among students who had received a “double dose” of literacy instruction through tutoring jumped back up by the equivalent of more than one-and-a-half grade levels.

“That’s a pretty big deal,” Donna Peduto, WVPEC’s executive director, said. “You see what targeted intervention does when you have a little bit of funding and support. It’s just amazing to think of that learning loss being reversed.”

Read with Me Weirton focuses on delivering extra help after school and over the summer to first- and second-graders who score lowest on the STAR Reading Assessment.

“That extra dose of instruction outside school,



Submitted photo

Elementary students in Weirton participate in the Read with Me Weirton program, which is designed to improve literacy rates.

coupled with the consistency of instruction that community partners provide, has been transformational,” said Christina Petrone, a CAHS graduate research assistant who serves as a WVU literacy consultant for the project.

Weirton’s community tutors note feeling empowered to help students by learning to speak the same language as teachers. The number of teachers reporting confidence teaching phonics jumped from 21% to 58% after the program provided them with specific strategies for teaching students with literacy challenges.

“Weirton’s strength is in using a structure that’s in place and being intentional

about leveraging established partnerships to make a difference,” Canyon Lohnas, a WVPEC program specialist, said.

**Building a Village brings learning home**

At Mary C. Snow West Side Elementary in Charleston, Building a Village works with teachers and Principal Destiny Spencer to meet students and families where they live — literally.

Building a Village brings family-oriented literacy activities to the Littlepage and Orchard Manor developments, two West Side housing complexes that many MCS students call home.

Equally, the project fuels partnerships aimed at creating permanent, self-sustaining literacy and developmental centers within those complexes — centers that will offer learning opportunities to children and caregivers alike.

Shanequa Smith, a restorative practitioner and WVU alumna who leads Building a Village with Melanie Page, the director of the NASA West Virginia Space Grant Consortium, knows that “many of the children who struggle with behavioral and academic issues” live at Littlepage and Orchard Manor.

“If we can put developmental and literacy centers there, then we’ll be helping

the kids and the families with something long-term,” Smith said. “The centers can be a place not just to drop kids off, but to build parenting skills and become part of a support system.”

Page said she was eager to “follow Dr. Smith’s idea of building up the community to take advantage of their strengths. Dr. Smith taught me that we cannot solve complex problems with projects but have to build relationships that allow communities to thrive.”

With Meadow Graham, a literacy consultant and CAHS adjunct instructor, Building a Village also gets MCS teachers the tools they need, including profes-

sional development around early literacy skills and classroom management.

“I hope to combine those issues to help provide early literacy instruction in a way that engages and motivates students,” Graham said. “Classrooms filled with interested students are easier to manage.”

**Two communities, one goal**

Recently, the National Center for Education Statistics released the Nation’s Report Card, revealing that reading and math scores fell for fourth- and eighth-graders in all states across the country, including in West Virginia, with average reading scores for those grades coming in at the lowest ever recorded for the state.

Peduto explained that education experts are so alarmed about test scores for early learners because “third grade is the development marker. If reading doesn’t happen by third grade, students will be at an academic disadvantage.”

Peduto and her colleagues are hopeful that the programs in Weirton and Charleston will reverse the trend.

“I certainly think it’s possible to see progress and change, even in only a short time,” Graham said. “The teachers are already hard at work doing so much to support their students, and making these school-community connections is an important way to effect long-term change.”

Both Building a Village and Read with Me Weirton are supported by Claude Worthington Benedum Foundation funding through Sparking Early Literacy Growth grants. The Benedum Foundation has named Sparking Early Literacy Growth in West Virginia as the foundation’s 75th anniversary project in education.

**DYSLEXIA**

FROM PAGE I-2

During its inaugural year, South Bronx Literacy Academy is expected to serve 60 to 80 students in the second and third grade with documented dyslexia or who show reading challenges through a formal assessment process, according to panel materials. Priority is given to applicants in the Bronx,

and it will receive \$710,000 for its specialized programs on top of the usual funding for new schools.

Classes are structured and teachers are trained to work with kids who have language-based learning disabilities, including read-alouds and adaptive technology. The school offers small class sizes led by co-teachers and backed by speech and occupational therapists, a school psy-

chologist and a literacy coach, and will eventually grow to serve second through eighth grade.

“Teachers repeatedly told me that he was lazy or the classic — that I needed to read more to him,” Naomi Peña said of her eldest son, who is dyslexic and eventually opted for a GED instead of a high school diploma.

“We want a space where parents are not made to feel

that they are to blame if their children cannot read,” she said. “Today, we end the blame and we empower all students, because we owe it to them — even if it wasn’t offered to mine.”

The issue is a personal one for Mayor Adams, who himself has dyslexia that went undiagnosed until college. That deferral had a profound impact on his childhood, and he frequently shares personal

stories about struggling in school or bullies who taped a sign to his desk chair, calling him dumb.

While launching dyslexia screeners in classrooms, Adams has made a similar program on Rikers Island a signature part of his agenda — but faced criticism over its slow rollout.

That effort will begin as a pilot program at East River Academy for students on Rikers, as well as Pas-

sages Academy in Brooklyn and the Bronx for detained students ages 17 or younger, and yet-to-be-determined adult education sites in September, according to top officials from District 79, the city’s adult and alternative programs.

“Mayor Adams is fully committed to providing dyslexia screenings for all New York City public school students and looks forward to bringing this initiative to our criminal justice involved youth,” said Amaris Cockfield, a spokesperson for the mayor.

“Under the leadership of a dyslexic mayor, we are changing the way we approach dyslexia, which will unlock the untapped potential in students who may feel insecure about their dyslexia or any other language-based learning disabilities they may have,” she said.

On the campaign trail and, more recently, at the State of the City, Adams estimated that 30% to 40% of inmates on Rikers are dyslexic.


“Dyslexia is a disability that many of our students face,” said Annette Knox, executive director of adult education, at a meeting of the City Council education committee last week.

“We’re also, as we’re screening for dyslexia, identifying [and] keeping track of any other indirect anomalies that might be there,” she added. “Because we want to make sure that at the end of the day, we know that we work with the most vulnerable students and they come from different levels. It is our role and our responsibility to ensure that we’re meeting them where they need to be.”

Glenda Esperance, superintendent of District 79, said staff already conducted site visits and are “finalizing details” of the new program.

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WVU

# Crisis leads to new College of Applied Human Sciences

BY EVA MURPHY  
Newsroom@DominionPost.com

Higher education has been far from immune to the pressures of the modern day.

Rising tuition, decreasing government funding, problems with access and declining enrollment have all contributed to a complex crisis.

In recent years, West Virginia University's senior leadership chose to see that crisis as an opportunity to change along with the landscape. In December 2020, President Gordon E. Gee issued a charge to transform the university in order for WVU to address the evolving needs of its students. Leadership communicated several goals for the academic transformation, including providing a rigorous and relevant education, leaning into the university's

land grant mission, finding academic efficiencies and identifying areas for growth and investment.

Like most large, old institutions, higher education has historically been slow to change and prone to developing organizational silos. To increase collaboration between academic disciplines and fulfill Gee's charge of academic transformation, WVU decided to combine three colleges that shared the common goal of improving human well-being, education and development. The College of Education, the College of Physical Activity and Sport Sciences and the College of Counseling and Wellbeing were integrated to form the College of Applied Human Sciences (CAHS).

Autumn Tooms Cyprès, founding dean of the CAHS, sees this collegiate metamorphosis as proof that WVU is different from the

typical ivory tower.

"WVU values innovation," she said. "This university is one of the most interesting places in the United States because they take their mission very seriously. What they care about most is the prosperity of the people they serve."

She tied the formation of the CAHS into WVU's land grant mission, detailed in legislation signed by Abraham Lincoln in 1862.

"The land grant mission is about translating research into real-world efforts that help prosperity, education, health and wellness," she said.

The merger, which had been under consideration for years, accelerated after Gee's 2020 charge. In 2021, the plans were made public, and preparations went into high gear.

Cyprès was brought on as the founding dean after a

competitive, nationwide search.

Cyprès, an internationally recognized author and educator, spent a large portion of her extensive career at educational institutions in Appalachian communities that face unique challenges, and she feels a sense of fulfillment to be able to continue that work.

"This is my dream job," she said.

The process of merging the three colleges took several years. Much of the effort centered around building infrastructure for the new entity and building bridges between the faculty and staff of the different programs. Such an ambitious initiative was not without complications.

"We had to put out a few fires," said Cyprès. "But we've also been able to make fire," she continued, referring to the successes of

the college so far. "We have been incredibly nimble, and that's come from the leadership team. We have the most incredible team I've ever seen in my career. Everybody is truly at the top of their game."

The college launched at the beginning of the fall 2022 semester.

One of the inaugural projects of the CAHS leadership team was to develop a free smartphone app to facilitate student well-being. "YOU at WVU" provides tips and resources to help students face challenges that arise during their time at the university. Topics covered include stress, mental health, finances, academics and social connection. The app also assists with setting goals and priorities, facilitates conversations between parents and students and allows students to share content.

"Every incoming freshman will be required to take a course on how to get this app and how to use it," said Cyprès. "Students stay anonymous and their privacy is protected, but it gives us information on what students are looking at."

Any observed spikes in activity on a particular topic, such as anxiety or depression, can help instructors contour their syllabi to address those issues.

"A hallmark of WVU is that this place is quite serious about making investments," said Cyprès.

The formation of the CAHS is an investment in the health and well-being of not only WVU's students, but the innumerable people that CAHS graduates will go on to serve.

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WVU

# Timing perfect for nursing school in Bridgeport

BY LINDSEY FLEMING  
Newsroom@DominionPost.com

Sixteen students are one semester closer to graduating from WVU's latest nursing school, the fifth to open in the state.

"WVU Medicine United Hospital Center was already expanding, so the timing was perfect for us to bring the fast-track program to a setting where there was a need," said Dr. Tara Hulsey, dean and E. Jane Martin Endowed Professor for the WVU School of Nursing of the Bridgeport campus, which opened in January and is housed in a new wing of the hospital. The newest campus joins four others, including those in Morgantown, Keyser, Charleston and Beckley.

The Bachelor of Science and Bachelor of Arts to Bachelor of Science in Nursing degrees accelerated undergraduate nursing program in Bridgeport mirrors Morgantown's curriculum. This means that within five semesters, students — who already hold bachelor's degrees in other fields — are able to graduate with 66 credits in 18 months' time.

"We have a proven track record of success for the curriculum," Hulsey said. "Our most recent graduating class in Morgantown received a 100% first-time pass rate on their NCLEX



Submitted photo

A brand-new facility as part of the WVU Medicine United Hospital Center will allow students at the newest campus to participate in an accelerated undergraduate nursing program.

licensure exam."

"It's going very well," said Veronica Gallo, Bridgeport campus chair and WVU School of Nursing assistant professor of the new school. "It's been great to work with United Hospital Center. ... Right now,

we plan to take on a second cohort next January."

This means the faculty, which consists of four professors, is in the process of reviewing applications of potential students to fill the 24 available seats.

"The first couple of

years of the program, that's your learning curve," Gallo said. "The faculty is learning the needs of the students and what works well and what doesn't."

The school is situated in the east wing at UHC, occupying more than 5,000

square feet on the fifth floor, according to a release from WVU. The space includes two classrooms, a skills lab, conference rooms, a student lounge and offices.

"This is a merging of the past and the future," Gallo

said. "Most nursing education used to be hospital-based. With this partnership, you get the old-time feel with the new-age edge of university resources."

"Collaboration with UHC leadership was essential for this partnership," Hulsey said. "The program is mutually beneficial — our students have access to state-of-the-art simulation equipment and on-site access to the clinical setting, and our graduates can help fill the nursing needs of the hospital and the community."

Those needs have only increased in recent years, Gallo said, adding that a shortage of nurses is "reported everywhere. You look at hospitals in the area and hear from administrators that they need more nurses. It's a consistent need."

Not to mention, she added, that there is now a more diverse and more ill patient population.

"This program means students become nurses prepared for hands-on patient care, and they're able to apply research and evidence-based practices for individuals and the health of the community, for issues that are bigger, beyond the bedside."

**TWEET** @DominionPostWV

## LEARNING

FROM PAGE I-7

"This may hinder the exchange of ideas from a diverse student group or demotivate participation among students with disabilities," Ross said.

Ross' paper provides tips and workarounds that empower educators to make the most out of these features and to help their students learn to do so.

"It's hugely frustrating that accessibility features aren't embedded at the front end of app development — that apps are developed and then there's the repair, back-end work to make them accessible, or we have to go through roundabout ways of using them accessibly."

"But as accessibility features become more user-friendly and straightforward to implement, that's going to drive adoption. For example, Twitter now allows you to attach text descriptions to pictures and makes that easy for end users. There's a ton of discussion out there about equity access — health that reaches all — and the new generation wants to be part of that movement."

The paper's coauthors included WVU doctoral student Kayla Abrahamson

and Assistant Professor James Wyant.

"Zoom, Google Meet and YouTube became standard practice for instructing students," Wyant said. "Now K-12 teachers have a higher comfort level with digital technologies, and the marketplace for educational technology, especially mobile apps, keeps getting bigger. Although cost has been a roadblock, access to open-source, free-to-use technology has grown substantially."

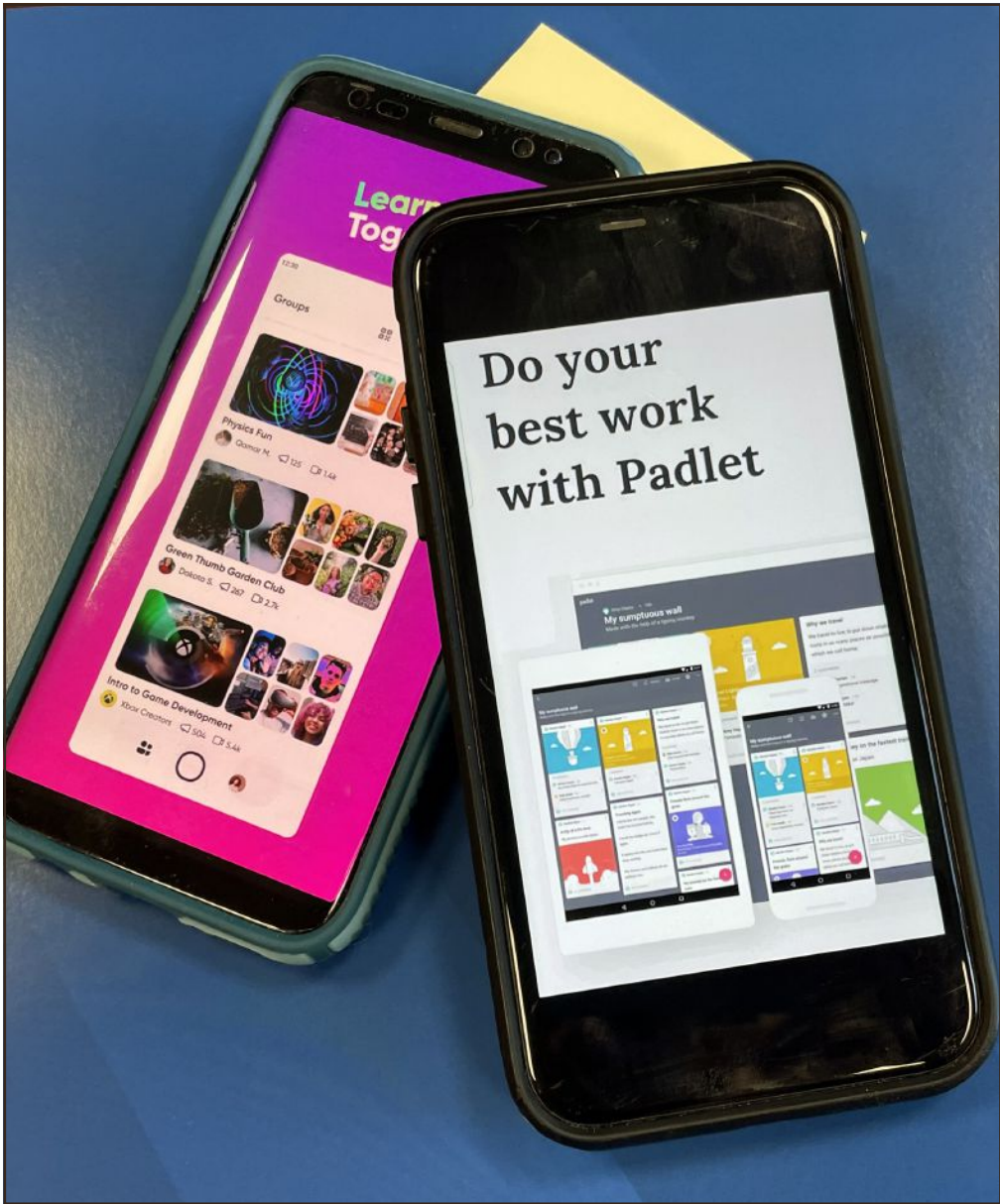
Ross said she believes technology has become indispensable for adapting instruction to each student's individual learning strengths, whether those are shaped by ability, disability or learning preferences.

"I like to think about whether there's more than one way for students to participate," she said. "Some students are comfortable in the classroom and comfortable leading. Some prefer time to process and reflect and would rather contribute afterwards. Some are comfortable typing, others want to verbalize. Apps provide multiple ways students can share content on a flexible timeline."

Ross added, "As teachers, the goal is to engage every student. The tools we

use will make the difference in whether we are successful or unintentionally create barriers to participation, and therefore unequal learning opportunities. Apps are very useful in that regard — they're fun, they add engagement and we can use them responsibly when we consider the accessibility of the content we're posting there to maximize engagement of all learners."

**SAMANTHA ROSS, AN ASSISTANT PROFESSOR IN THE COLLEGE OF APPLIED HUMAN SCIENCES, SAID SHE BELIEVES TECHNOLOGY HAS BECOME INDISPENSABLE FOR ADAPTING INSTRUCTION TO EACH STUDENT'S INDIVIDUAL LEARNING STRENGTHS, WHETHER THOSE ARE SHAPED BY ABILITY, DISABILITY OR LEARNING PREFERENCES.**



WVU photo

WVU experts on adapting physical activity for individuals with disabilities saw gym teachers and other educators make creative use of apps during the pandemic. They said they believe app accessibility features benefit students with disabilities, but their research shows those features often aren't all they could be. Now they're training a rising generation of physical education teachers to use apps in a way that benefits all learners.

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COLLEGE

# Pierpont programs rated top in their fields

Newsroom@DominionPost.com

Pierpont Community & Technical College announced two of its programs were named top in their fields by Best Value Schools.

Pierpont's Licensed Practical Nursing (LPN) program has been named the top LPN program in the state of West Virginia by the publication. The program is headed by Assistant Professor and Program Coordinator Annette Arnett.

"It gives me great pride to have our program recognized as the best in West Virginia, and it reflects Pierpont's priority to providing a high-standard nursing program that is affordable for its students,"

said Arnett. "The LPN program is the epitome of Pierpont's mission statement of providing accessible, responsive, comprehensive education that works."

Pierpont's LPN program, which is a one-year certificate program, provides students with the opportunities to learn, train and apply the knowledge needed for nursing of individuals, families and communities in health and illness.

"Our program utilizes multiple modes of learning, including hands-on in-class work, clinical practicums and virtual experiences to enhance our students' comprehension of nursing," said Arnett. "Our students

graduate with the ability to successfully pass the NCLEX and go on to competently practice in a variety of clinical settings."

"The demand for LPNs remains high and we are excited to deliver quality and affordable education to our students," said Amy Cunningham, dean of Pierpont's School of Health Sciences. "We can have students ready for their careers as an LPN in as short as 12 months."

Pierpont's Food Service Management, Culinary Concentration program also was awarded by Best Value Schools. Recently, the program was rated as the number four best culinary program in the United

States, which is an honor the program has received multiple times.

"For Pierpont's Culinary Arts program to again earn a top five national ranking, I couldn't be prouder," said David Beighley, dean of the School of General Education and Professional Studies and associate provost for academic and student learning. "This recognition is a testament to the phenomenal work of our Food Service Management faculty, the program's students and the successes achieved by so many of our graduates within the food and hospitality industry."

"Our Food Service Management faculty have

worked hard over the years to foster exceptional programs, so to be recognized as a program ranked in the top five nationally is always an honor," added Natalie Feltz, associate professor and program coordinator of Pierpont's Food Service Management program.

Recently, the program moved into a new facility that is providing students with even more opportunities to learn and become some of the best chefs in the area.

"Our new facility is the icing on the cake as we not only have the faculty, students and programming that are on par with some of the best schools in the country, but we now have a beau-

tiful, state-of-the-art facility that you would expect of a top-ranked program," said Feltz.

The facility, housed at the Middletown Commons in White Hall, has two full-sized kitchens where students of the culinary, pastry and baking and nutrition and dietetics concentrations can all have their own space for their students to receive the hands-on learning they deserve.

At Pierpont, students have the opportunity to learn in some of the most respected programs in the state and country.

For more information about Pierpont Community & Technical College, visit pierpont.edu.

GREEN INDUSTRY

## Pierpont, WVNLA Landscape Technician Training a success

Newsroom@DominionPost.com

Pierpont Community & Technical College, in partnership with the West Virginia Nursery & Landscape Association (WVNLA), held an all-new Landscape Technician Training course at its Advanced Technology Center campus in April.

The course, which consisted of 40 hours of classroom instruction and hands-on application from expert instructors from the WVNLA, provided students with the job-ready skills needed for entry-level positions in the Green Industry.

"This course and its instructors gave our students the expert training that many have come to expect from Pierpont," said Nancy Ligus, director of workforce, continuing education and economic development at Pierpont. "The instructors shared not only their vast combined knowledge, but their relevant experiences from working in the industry, an invaluable asset to the training program."

Throughout the course,

students learned how to operate and maintain tools and equipment, identify and design plant layout, techniques in sod and plant installation, critical safety principles and much more.

"Congratulations to Pierpont's first Landscape Technician Bootcamp students for successfully completing their training, including earning their OSHA 10 Certification," said Ligus. "Our students are now ready to immediately enter into a highly in-demand career field, where opportunities range from nursery and greenhouse workers to lawn service technicians, landscaping and ground maintenance, or even growers of landscaping products."

Ligus continued by giving a special thank you to the WVNLA and its member instructors for their commitment to delivering this program at the Advanced Technology Center, including Julie Robinson (WVNLA executive director), Bobby Gompers (Highland Landscaping and Nursery), Nick Buysee, Michael Biafore,

Patrick Biafore (Biafore Landscape Development), John Jett (Jettree Landscaping & Horticultural Services) and Betsy Raynes (Riverside Sod Farms LLC).

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Pierpont's Center for Workforce Education (CWE) provides a variety of short-term workforce programs designed to provide a student with skill upgrades, certifications and training for many purposes, including gainful employment, salary increases and/or advancement within a company or industry.

Pierpont CWE is planning additional trainings and courses in the soon, including CompTIA Security + Training Bootcamp, Linux Training Bootcamp and Mental Health First Aid Training.

For questions, call 304-367-4920. For additional information on programs, visit pierpont.edu/workforce-continuing-education



Submitted photo

A participant in the first Landscape Technician Training course at Pierpont Community & Technical College.

COMMUNITY COLLEGE

## To help students, some colleges provide double the teachers

### Two-year colleges have worst grad rates

Associated Press

EVERETT, Wa. — Terica Purvis squinted through goggles as her hands carefully guided a pipette full of indigo-tinted fluid into clear glass test tubes.

It was the last chemistry lab of the winter quarter at Everett Community College. Purvis was working through the steps of what chemistry professor Valerie Mosser jokingly refers to as the "post-apocalypse survival" lab — an experiment using boiled red cabbage water to test the acidity of common household chemicals.

Purvis, 27, is in her first year of study for an associate degree in nursing at Everett Community College. She is also one of more than 6,000 Washington community and technical college students enrolled in the state's Integrated Basic Education and Skills Training (I-BEST) program.

Students who need extra help in subjects such as algebra struggle to learn if the content is taught in an abstract way, educators say. So I-BEST programs feature two teachers in the classroom: One provides job training and the other teaches basic skills in reading, math or English language.

Nationally, two-year community colleges have the worst completion rates

in higher education, with only slightly more than 40% earning degrees within six years.

In Washington state, students in the program graduate at a higher rate. Among students who started college from 2015 to 2018, an average of 52% enrolled in I-BEST classes earned a degree or certificate within four years. That compares with 38% of students who did so while enrolled in traditional adult basic education coursework, according to the state Board for Community and Technical Colleges.

The program is so successful that 12 states have begun implementing an I-BEST model at one or more education institutions.

For Purvis, who hadn't been in school for nearly a decade, this class meant getting extra math help when she needed it: during a chemistry class.

Each time Mosser gave a lecture or held a lab, she was joined by Candace Ronhaar, who works as a tutor and extra math instructor.

In one session, Ronhaar drew a heart on the whiteboard. She wrote the word "mole" beside it, and explained it is a unit of measurement equivalent to the amount of atoms in 12 grams of carbon-12. She guided students through practice problems, calculating the mass of chemical compounds.

All six students in Chemistry 121 were also taking an entry-level statistics class, and Ronhaar was co-instructor for

both courses. Mosser said Ronhaar's presence was the most valuable part of the I-BEST model.

"I'm an assessment instructor," Mosser said. "She's just a helping instructor. In the minds of students, the difference is incalculable. They have a different relationship with her. They're more willing to go to her, because she doesn't grade them."

Purvis said chemistry was the first class that ever "humbled" her. She doesn't think she would have passed without I-BEST. Students fresh out of high school had an easier time remembering chemistry and math, Purvis said, but she hadn't studied those subjects for 10 years.

"They couldn't have picked a better second instructor," Purvis said of Ronhaar. "I loved it. We went to her office hours all the time."

After high school, Purvis spent six years as a cook in the Navy, and took classes at a couple other colleges. Last year, she was medically discharged and returned to school at Everett Community College full-time. She plans to go on to pursue a Bachelor of Science in Nursing, and hopes to work in labor and delivery at a hospital.

Helping more students graduate from nursing school has a larger societal benefit. In the first year of the pandemic, from 2020 to 2021, the number of working registered nurses in the United States decreased by more than 100,000 — the highest drop

in four decades. An estimated 200,000 jobs for registered nurses are expected to open each year in the U.S. through 2031, the Bureau of Labor Statistics reported in 2021.

I-BEST was launched as a state pilot program almost 20 years ago as data suggested students needed vocational training to improve job prospects. The program was to change the remediation model in most community colleges, where students who don't do well on placement tests must take pre-college classes in their weak subject — essentially a repeat of high school.

I-BEST enrollment in the state has increased by more than 20% in the past five years, bringing in a diverse group of students. Forty-six percent of its students are students of color, 55% are women and 39% have dependents.

I-BEST opens the door to federal financial aid by making it available to students who didn't graduate from high school. Under financial aid rules, students must either have a high school diploma or prove their "ability to benefit" from aid by being enrolled in a qualifying program, such as I-BEST, where they learn basic skills as part of their career pathway.

Along with nursing, other high-demand I-BEST job pathways include aeronautics, manufacturing and information technologies.

At Bellevue College, I-BEST students enrolled in Business 101 meet with

instructor Eric Nacke for an adult basic education class on a separate day. Nacke teaches English in the context of the business world.

Student Forouzan Barfibafeghi moved from Iran to the U.S. in 2020. She holds a bachelor's degree in business from Islamic Azad University in Tehran, where she graduated in 1999. She said Nacke's classes have helped her develop her English skills and given her a sense of community.

"We have created a strong bond between us. That is one of the highlights for me," said Barfibafeghi, who hopes to find work in the insurance industry after completing an associated degree in business.

In Washington, because I-BEST uses a mix of state, federal and other grant funds, the state doesn't know how much the program costs. But the model calling for two instructors does make it more expensive than other adult basic education programs. The program might be more broadly replicated if it weren't so costly, state community college spokesperson Laura McDowell said.

As Purvis prepared for her next quarter of classes, the student said she hoped her future instructors would be as helpful as Ronhaar.

"She's my favorite instructor so far since I've been going to Everett," Purvis said. "We needed her. She had to be there."

WVU

## University makes entrance exams optional

WVU Today

West Virginia University became the first public higher education institution in the Mountain State to permanently adopt a test-optional admissions policy, following approval from the WVU Board of Governors in April.

"WVU is a leader in providing students with new choices when it comes to college and, with this permanent test-optional move, joins the growing number of institutions nationwide that are taking this approach to college admissions," said George Zimmerman, assistant vice president for Enrollment Management.

Nationwide, more than 1,800 institutions are test-optional or test-free, according to FairTest, the National Center for Fair and Open Testing.

"Students have been embracing test-optional admissions processes as part of their college searches since the height of the COVID-19 pandemic and, going forward, we have an obligation to remove any barriers that may deter those interested in higher education," Zimmerman said.

The WVU test-optional admissions policy was initially adopted temporarily ahead of the fall 2020 semester at a time when restrictions due to the COVID-19 pandemic were keeping many college-bound high school students from taking either the ACT or SAT.

Since then, it has been extended three times to address ongoing pandemic effects and reduce the overall stress of the college application process for students. The last of the extensions runs through spring 2024. After that, the permanent policy will take effect.

"Giving students the flexibility to choose whether or not standardized tests are included in their college applications has shown to be effective in helping them feel more in control of the process," Zimmerman said.

The university will continue to offer scholarships for test-optional applicants and those providing test scores. The ACT or SAT remain requirements for the PROMISE Scholarship.

Certain programs also have specific testing requirements and test scores could be necessary for course placement. More information and details can be obtained from WVU's Undergraduate Admissions department.



NETL

# Research faces challenges of green energy transition

BY DAVID BEARD  
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Many argue that the Biden administration's green energy policies are outpacing the technology to achieve them. But the National Energy Technology Laboratory is embracing the challenge.

"We're about trying to find solutions and develop technological solutions," said NETL Director Brian Anderson, a West Virginia native and former WVU professor.

"The administration has set forward, from a global perspective, very lofty goals, inarguably lofty, in terms of the ability to reduce carbon emissions," he said. "We sit here at NETL as the laboratory that has been developing carbon capture and sequestration technology, as well as horizontal drilling and fracking technology, to reduce its impact to the environment."

They're working on technologies to reduce methane emissions and ways to take existing resources and convert them into new types of energy carriers, he said. "Those lofty goals give us latitude to start working on really innovative technologies, as we've done throughout our history.

"As a technology developer, it's an exciting time for us to be able to take what we work on, support our existing domestic resources, the ability of our existing domestic resources to be able to contribute to the future. Our mission is to deliver solutions for not only an environmentally sustainable but prosperous energy future."

Finding the balance of reliability, affordability,



Staff from the National Nuclear Security Agency visit the Morgantown site in April. Below, NETL Director Brian Anderson speaks at U.S. Department of Energy's Office of Fossil Energy and Carbon Management NETL project review.

resiliency and environmental sustainability, he said, "It's a more difficult challenge than many people give it credit to get all of those right."

NETL conducts a host of projects at its three sites: Morgantown, Pittsburgh and Albany, Ore. We talked about just a few highlights.

The REACT project, featuring collaborations with WVU, explores using microwave energy instead of thermal energy for reactor processes to convert natural gas to hydrogen or ammonia — breaking 100-year-old methods on how ammonia and therefore fertilizers are manufactured.

Another project is studying what happens with flu-

ids in the subsurface when carbon dioxide or natural gas flow. NETL has just one of two units in the world able to watch the fluids flowing at the micron or sub-micron levels in real time.

Another is NETL's open-source computational fluid dynamics code, MfiX — Multiphase Flow with Interphase eXchanges — for multiphase flow reactor modeling efforts. This software has more than 7,000 registered users worldwide.

MfiX is a model in great detail, large new reactive energy conversion systems, Anderson said, and takes some risk out of the process of scaling up from pilot project to demonstration scale.



He cited the example of a company facing some problems developing nuclear waste reactors.

NETL used their parameters and employed MfiX to model their processes and suggest minor modifications to the configuration

NETL announced recently it is receiving \$150 million through the Inflation Reduction Act to support site-wide infrastructure and laboratory modernization upgrades at all three of its sites.

Investments in Albany's Advanced Alloy Development Center will be used to formulate even more cost-effective, durable metal alloys to develop cutting-edge energy-producing processes and facilities that can generate affordable clean energy and support growth in emerging U.S. industries, such as hydrogen transport and use.

Some funds will provide resources for the Geological, Environmental & Materials Computational & Visualization Laboratory to apply artificial intelligence and machine learning to visualize and monitor the movement of carbon dioxide stored underground to address potential challenges. Investments also will supplement existing funding for the Computational Science and Engineering Center to build a new facility in Morgantown, which will include innovative collaboration space for the next level of high-performance computing to accelerate breakthroughs in more abundant, affordable and reliable clean energy solutions such as clean hydrogen and carbon dioxide removal technologies.

And investments in NETL's Carbon Conversion R&D and Critical Materials R&D programs will support modernization of laboratory facilities in Morgantown and Pittsburgh to build in flexibility for these emerging and mission-critical areas of research and development.

**TWEET** @dbeardtdp

## INDUSTRY

# Focus Forward looks at educating the workforce for energy change

BY DAVID BEARD  
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Every year, the West Virginia Public Education Collaborative hosts a Focus Forward symposium, with the goal of "Preparing Today for the West Virginia of Tomorrow" by linking education and economic development.

This year's symposium — organized by the collaborative and the Claude Worthington Benedum Foundation — was titled Focus Forward with Big Energy; its presentations and panel discussions focused on "diversifying our energy portfolio to prepare for a competitive workforce in a globalized economy."

Nathan Flesher, with McKinsey & Company, talks about the issues driving green energy.

"I really believe this is West Virginia's time," said WVU President Gordon Gee. The danger is we could squander the moment.

He touted Universities United, putting the state's higher education institutions on the same page instead of competing with each other. And the question arises, "Are we training the right people to do the right things?"

As part of the same "fireside chat" on Energizing Leadership for the Future, Sen. Joe Manchin said, "We are on the cusp of really exploding with all different forms of energy." We're not done with coal — it will have more value with new technologies being explored, but there's also hydrogen and advanced nuclear.

Manchin talked the Inflation Reduction Act. He repeated his belief, "You cannot eliminate your way

to a clean environment. You can innovate your way." The IRA lays a path to produce more fossil energy over the next 10 years while developing renewables into something more reliable.

The regional PJM grid, he said, is powered by about one-third coal and West Virginia is the backbone of that system. But as we move to net-zero carbon, hydrogen will become the new heavy lifter. "It has the horsepower to run the country."

West Virginia, he said, is the best-prepared state for one of the Department of Energy's hydrogen hubs. "I think West Virginia is the place that will show the best return on investment for energy." Advanced nuclear can repurpose defunct coal plants. Rare earth elements for battery technology can come from coal mine waste. "There's a lot of places that won't accept the things we're going to do."

Ted Wiley is co-founder and president of Form Energy, which expects to start construction of its Weirton factory this year and begin manufacturing iron-air battery systems in 2024 for broad commercialization.

He was part of a panel discussion that fielded a question on what the education system needs to do to meet the demands of the new energy world.

He said 550 jobs of the roughly 750 new jobs at the site will be non-degree positions. It will require people who are dedicated and can be counted on and are good with their hands. The iron-air process is brand new and will require a new training program to teach



Jen Giovannitti (right), president of the Claude Worthington Benedum Foundation, leads (from left) WVU President Gordon Gee, Sen. Joe Manchin and Marshall President Brad Smith in a "fireside chat" on leadership.

the workers, which will require a partnership with higher education. He wants a workplace that creates circumstances to help the employees thrive.

John Farris, vice president and general manager of Nucor, cited the wisdom that good employees need to be responsible, open to feedback and bring a sense of gratitude to the workplace. "There's no company on Earth that can beat a team of people that exhibit those three things."

Nucor is the largest steel producer in the United States and a Fortune 150 company based in Charlotte, N.C. It produces steel by recycling scrap metal in electric arc furnaces, mak-

ing the company North America's largest recycler of any material.

Nucor wants to encourage women to work there, Farris said, and is committed to removing barriers to make that possible — such as offering on-site child care. Another goal is providing career opportunities for people who are on the recovery path from substance abuse. This is a new approach for Nucor, he said.

Arria Hines is CEO of Allegheny Science & Technology and prime partner in the Appalachian Regional Clean Hydrogen Hub group seeking to bring a hub to the state. "This is an unprecedented time for

Appalachia," she said.

The USDOE wants to have its hubs come fully operational in 10 years, so that means they need to start talking with 8-year-olds now about possible career paths and give kids an image of what types of careers will be out there. "Not everybody needs to go to college."

Marshall University President Brad Smith talked about education and cited the maxim that innovation requires inspiration and execution. West Virginians have both qualities. "We have always answered the call."

He talked about the need for "design thinking" in education, defined by the

Ideo group as "a human-centered approach to innovation that draws from the designer's toolkit to integrate the needs of people, the possibilities of technology and the requirements for business success."

Smith said, "Design thinking teaches you to fall in love with the problem, not your idea." It begins broad, with diverging idea proposals before going narrow with converging solutions. "We have to build that into our education system," he said.

Companies follow talent, Smith said. We need to consider what communities need to attract and keep talent. West Virginia has what people want — outdoor recreation, scenic beauty and more — and that's part of the reason for the success of the Ascend WV program drawing remote workers to live here. Ascend expects 1,000 remote workers to move here in next five years, not counting their families.

The West Virginia Public Education Collaborative explains that it is committed to advancing public schools in West Virginia from early childhood through higher education. "By engaging key local stakeholders and national experts through outreach and innovative initiatives, WVPEC partner-members aim to identify West Virginia schools' most pressing educational needs, remove barriers to student success and positively impact the educational system and economy of the state."

**TWEET** @dbeardtdp

THIS YEAR'S SYMPOSIUM — ORGANIZED BY THE COLLABORATIVE AND THE CLAUDE WORTHINGTON BENEDUM FOUNDATION — WAS TITLED FOCUS FORWARD WITH BIG ENERGY; ITS PRESENTATIONS AND PANEL DISCUSSIONS FOCUSED ON "DIVERSIFYING OUR ENERGY PORTFOLIO TO PREPARE FOR A COMPETITIVE WORKFORCE IN A GLOBALIZED ECONOMY."



WVU

# Law school trains students in Land Use and Sustainable Development Law Clinic

BY DAVID BEARD  
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WVU law students interested in land use and real estate law can gain real-world experience through the law school's Land Use and Sustainable Development Law Clinic. The clinic works with local governments and nonprofits to provide legal and planning services to conserve land and water, support local land use planning and offer educational opportunities for law students.

The clinic was created in 2011, said Director Katherine Garvey, who joined the staff in 2012. Back in 2010, some coal companies violated the Clean Water Act, and the attorneys who argued the case said the penalty money should go to the affected communities rather than into the U.S. Treasury.

So the Department of Justice produced consent decrees sending part of the money to the West Virginia Land Trust and part to WVU to create the clinic, Garvey said. For a few years, it was fully funded by the decrees, and since then they do different types of fundraising—mostly grant writing — and they have some agreements with the federal government to support their work.

The clinic doesn't litigate, Garvey said. Often small local governments lack specialized attorneys and the clinic can help them with land use plan-

ning projects and real estate projects.

They've worked with the West Virginia Land Trust, other land trusts and the U.S. Department of Agriculture conservation easement program. With the USDA, Garvey said, "We've helped them protect a lot of agricultural land, forest land, Civil War battlefields and some recreational uses."

The clinic staff includes 12 third-year law students who put in 20 hours per week, seven attorneys (two are professors) and two certified planners.

Some by-the-numbers from the clinic: 5,000-plus acres of land conserved; 30 comprehensive plans adopted; 97 West Virginia communities served in 51 counties; and 82 students who have worked in the clinic to date.

The clinic reports that following the summer 2016 historic floods, it supported recovery efforts by developing comprehensive plans for the city of White Sulphur Springs and town of Clendenin. The clinic also rendered a variety of legal services on behalf of the town of Hundred, the city of Richwood and on behalf of Appalachian Service Project for the town of Rainelle.



Katherine Garvey



Submitted photo

Students discuss stormwater regulation with the mayor of Wardensville.

To help address the state's broadband desert, the clinic has developed a free toolkit, Broadband in West Virginia: A Legal Guide for Local Governments.

The clinic usually has about 100 matters on its plate at any one time, Garvey said. Some may take just a couple hours. At the

more complex end, they have an agreement with the USDA to review more than 4,000 easements across the country.

When students finish their clinic work, some enter private practice in real estate law, Garvey said. Others go to work for local governments or the state or

federal government. This year, the majority already have jobs as they prepare for the bar exam.

"It's great for students to get experience while supporting communities in West Virginia," Garvey said.

TWEET @dbeardtdp

**THE CLINIC STAFF INCLUDES 12 THIRD-YEAR LAW STUDENTS WHO PUT IN 20 HOURS PER WEEK, SEVEN ATTORNEYS AND TWO CERTIFIED PLANNERS.**

## ENERGY

# WVU and partners build a solar-power test site in Fairmont

WVU Today

The launch of a partnership between West Virginia University engineers and the nonprofit and utility sectors could bring the region one step closer to integrating solar-generated power into the electrical grid.

Anurag Srivastava, professor and chair of the Lane Department of Computer Science and Electrical Engineering in the Benjamin M. Statler College of Engineering and Mineral Resources, will support the construction and analysis of a "solar testbed" at the I-79 Technology Park in Fairmont. The testbed has been selected for a \$2.3 million grant from the U.S. Department of Energy, pending approval and finalization of award negotiations, with land donated by the High Technology Foundation and in collaboration with utility company FirstEnergy.

The High Technology Foundation, developer of the I-79 Technology Park, is moving the park towards carbon-neutral operations in response to a growing demand from its knowledge-sector tenants.

The solar energy produced at the small-scale testbed site will enable Srivastava to study questions related to battery storage, grid integration and cybersecurity of solar power.

Solar panels most commonly generate solar energy using photovoltaic cells, which create electrical charges when sunlight hits them. Currently, solar-generated electricity can power the individual buildings where some of these panels are installed. Researchers like Srivastava are working to improve storage for solar power and "how the flow of solar energy into the main

electrical grid impacts the system," he said.

With the solar power generated by the High Technology Foundation's 1-megawatt testbed and by multiple other solar initiatives launching around the region, Srivastava estimated 50 MWs of solar energy could be integrated into West Virginia's power grid over the next several years, enabling his team to "get a unique before-and-after perspective" on power grid performance once solar power joins other current sources of electricity for the grid, such as coal and natural gas.

Srivastava, the technical lead for the study, will assess the performance of components such as panels, sensors and batteries, while developing machine learning algorithms that can help a solar-connected grid defend against attacks or natural disasters.

Statler College Professor Parviz Famouri, Teaching Associate Professor Jignesh Solanki and Associate Professor Sarika Khushalani Solanki will support the technical analysis.

The West Virginia Legislature passed Senate Bill 583, creating a state solar utility program, in 2020; but the state still lags compared to sunshine-rich places like California, Texas and Florida when it comes to adoption of both industrial-scale solar power and home solar systems like rooftop panels.

According to Srivastava, "a more diverse grid that gets power from many different sources is better than an extremely centralized grid like we've have had in the past, where a few big facilities generate most of the electricity."

Srivastava sees promise in solar's ability to provide a backup source of power



WVU photo

Mohammed Mustafa Hussain, a computer science graduate student, runs a power grid simulation at the WVU Engineering Research Building, one of the sites where Anurag Srivastava, professor and chair of the Lane Department of Computer Science and Electrical Engineering, will research the integration of solar power into the electrical grid.

when portions of the grid are disconnected to minimize damage during a crisis such as December's earthquake in California or the attack on substations in North Carolina.

"With a more diverse grid that draws on solar as well as other energies, you don't rely on one fuel source or a few plant locations," he said. "If a fuel source is not available or economical or the plant is offline, there are alternatives. Having those alternatives is crucial, especially in the case of extreme adverse events."

However, the more complex the grid, the more vulnerable it is. Solar farms use networked devices like sensors and inverters to integrate into the grid and that can report back on their performance. Srivastava emphasized that the connectivity of those

devices makes them vulnerable to cyberattack.

Then there's the weather. Solar is unpredictable and intermittent, with generation dropping anytime the sun's not shining brightly. Solar panels are also vulnerable to damage and dirt, because they need to be exposed to the elements to capture the sun's rays.

"A main focus of this project is assessing the health of solar panels in our system," Srivastava said, "as well as monitoring the interface that connects the solar generation plant with the grid."

The intermittency of solar is why he's evaluating how well batteries can store solar-generated electricity, so power from those batteries can be integrated under controlled conditions, rather than allowing the unpredictable peaks

and valleys of solar power to introduce uncertainty into the grid.

"The three basic measurements to assess power grid performance are voltage, current and frequency," Srivastava explained. "A fridge, cooking range, anything we have at home, is designed to operate at a fixed voltage. If we integrate solar, the impact on voltage may be different. We want to see that impact so we can make sure it's controlled. Our testbed sensor data will answer the question of whether we're controlling it successfully."

Already, apparent solar energy anomalies that occur when sudden cloud cover forms, for example, can look like an attack or disaster scenario to the humans and machines that maintain the grid's operation. To combat that, Sri-

**THE HIGH TECHNOLOGY FOUNDATION, DEVELOPER OF THE I-79 TECHNOLOGY PARK, IS MOVING THE PARK TOWARDS CARBON-NEUTRAL OPERATIONS IN RESPONSE TO A GROWING DEMAND FROM ITS KNOWLEDGE-SECTOR TENANTS.**

vastava's team will create AI programs that can use machine learning to distinguish the difference, drawing on real-time grid reports with weather data.

High Technology Foundation President and CEO James Estep serves as managing lead for the project. "The Public Service Commission's recent move authorizing the deployment of solar farms in West Virginia is an important shift in the state's energy policy," Estep said, "The Solar Testbed Project will be valuable in addressing fundamental challenges throughout this deployment."

"The data analytics ecosystem we're establishing with WVU at the I-79 Technology Park in Fairmont positions the region to participate in the multi-billion-dollar expansion of the commercial climate and weather industry."

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WVU

# Engineer works on applications for biomass

WVU Today

Under the scorching sun on a May 2022 afternoon, workers wipe the sweat from their brows between pounding 10-inch greenish-yellow stems into the soil on a patch of land at the West Virginia University Agronomy Farm. It's one of many sites — not just in West Virginia, but also in surrounding states — where visions of a future fueled by biomass are engrained into mainly forgotten lands. It's a vision of alternative fuels and safer, sustainable products, all at an economical price-point.

In the Mid-Atlantic region alone, more than 8.5 million acres of mined and marginal agricultural property are primed for reclamation, said Jingxin Wang, professor of wood science and technology. Left alone, it'll remain vast, empty space.

But Wang's got a tall task: Lead a multi-state, multi-university project — funded by a \$10 million U.S. Department of Agriculture grant — that aims to revitalize and reinvent these regional lands with biomass: growing plants to be used for energy, heat, bioproducts and other practical applications.

Those greenish-yellow stems plunged into the ground at the Morgantown farm? They're hybrid willow cuttings, a short-rotation woody biomass crop developed by the State University of New York and Cornell University.

"Not much of this crop is grown in this area," said Jamie Schuler, associate professor of silviculture and leader of one of the project's task groups.

Schuler is helping to oversee the group — which includes contractors from Fairmont-based AllStar Ecology — planting the willow cuttings on this site. Some planted patches have been doused with biochar, charcoal produced from plant matter that can preserve nutrients in the soil to make it more porous.

Within weeks, the cuttings should start shooting out roots. And after one or two growing seasons, they can be five- to 10-feet tall.

The willow itself can provide a similar amount of energy as other hardwoods and is a carbon-neutral energy source. After a year in the ground, the team will chop them down to four to six inches high, causing the willows to multiply.

Typically, willow can be cultivated every few years at relatively low cost and harvested a handful of

times before needing to be replanted.

"What we have out here with this project is not only about seeing how much biomass we can grow on these kinds of marginal ag sites, but can we grow them in a way that's sustainable?" Schuler said.

You can count on consistency with the harvest, too. If they're duds, they're all duds. And if they thrive, all will thrive.

"They're all clones," Schuler said of the cuttings. "They're exactly the same genetically. So we'll get a consistent crop out there. If we can find one that's a really good producer, we can replicate that one because all we've got to do is take the cutting and jam it into the ground and it'll replicate itself."

**Survival = success**

In many ways, this is a clinical trial — but instead of producing a medical treatment, it's harvesting a healthy crop and applying its qualities to produce energy.

"Our initial indicator of success will be survival," Schuler said. "We're expecting 90% survival at this site."

The Agronomy Farm is one of many. In north-central West Virginia alone, there are six sites, including ones in Reedsville, Jackson's Mill and Jane Lew. In addition to sites in West Virginia, others are scattered across New York, New Jersey, Delaware, Pennsylvania, Maryland, Virginia and Ohio.

Willow is not the only biomass crop at play; switchgrass, a self-seeding perennial crop, has also been planted. Switchgrass is used primarily for electricity, heat production, soil conservation, forage production and fiber. Forest logging residue is also a major feedstock of the project.

Observing from a 30,000-foot view is Wang, the leader of the massive undertaking officially named the Mid-Atlantic Sustainable Biomass for Value-Added Products Consortium (MASBio), a group of universities, industry partners, national laboratories and government agencies advancing the science and practice of sustainable bioproducts.

"MASBio is a complex, integrated effort that includes education, research and outreach," said Wang, who has taught forest and biomass harvesting and analysis, and computing applications in forest and



WVU photos

Jamie Schuler holds stalks of hybrid willow at the WVU Agronomy Farm. Below, Engineer John Hu is working on applications for biomass as safer adhesives.

natural resources for more than 20 years at WVU.

"Leading a project of this scale and importance reflects the research stature of our faculty," said WVU Vice President for Research Fred King. "Dr. Wang has worked to build a strong network and strategic relationships with industry, landowners and policymakers across the region to set the stage for this initiative. Together, they can build on the established momentum to making renewable energy an everyday reality that will help power the future of our nation."

Days after Schuler's team planted the willow cuttings, Wang stopped by the site to envision what awaits.

His research interests include biomass energy and bioproducts, forest carbon sequestration and optimization, computer simulation and system modeling, and forest ecosystem management and climate change. Somehow, all of those components play a role in the project before his eyes.

"For the Mid-Atlantic region and West Virginia and Appalachian regions, specifically, we are heavily forested states," Wang said. "But we also have an opportunity to utilize so-called abandoned or disturbed mining land. To grow

biomass crops and get use out of the byproducts is our purpose."

**The glue that binds**

Within WVU, MASBio reaches past the Davis College of Agriculture and Natural Resources, of which Wang and Schuler are both faculty members.

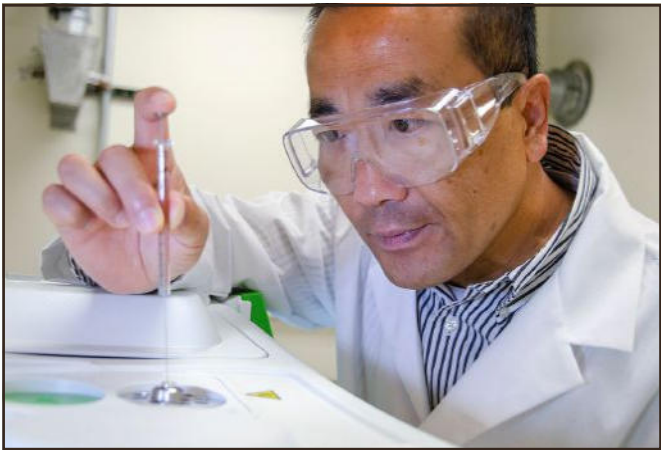
Engineer John Hu recognizes the scope of the project, as well as the moving pieces that make it happen from start to finish. Beyond the fields are Hu's labs.

"This is probably the largest project you can get from the USDA," said Hu, the Statler chair in engineering for natural gas utilization and leader of one of MASBio's task groups. "My task is to convert the biomass to different chemicals."

From the biomass, Hu's group can develop adhesives — some of which can be edible and added to food products. Others can be used for building construction. Or to use for toys. One of the major differences is that chemicals derived from biomass are much safer.

"Look at how dangerous some toys can be," Hu said. "If a child accidentally eats binding material from a toy, it gets into their body and the glues and adhesives from petroleum are rather dangerous."

"So what we can do is to



build an adhesive from the biomass and combine it with protein from soybeans — which you can eat, right? — and that becomes a very strong adhesive that's not only environmentally-friendly, but safe and high-value."

Hu will also look at converting biomass to biochar — yes, the same biochar mixed into the soil to help preserve the nutrients of the crops. But biochar has additional features. It's been used in wastewater treatment to remove contaminants.

And no real project would be complete without 3D printing. Hu's research group hopes to make products by running biomass-derived lignin into 3D printers.

Hu said the researchers want to make a system where products from biomass can be a part of

stormwater management, mitigating acid mine drainage, restoring streams, carbon sequestration and improving soil and water quality.

"With the knowledge and expertise on our team, we'll be able to make a significant contribution to further development of the sustainable bioproducts sector with decarbonization of the biomass supply chain system."

Regardless of the use, Hu is a realist when it comes to the potential success of biomass: It's all about the money.

"Biomass helps the environment," Hu said. "We know that. But the bottom-line economics is the key factor. That's why we convert it to high-value chemicals for economics."

For more information, visit the MASBio website at [masbio.wvu.edu](https://masbio.wvu.edu).

NATION

## SCOTUS to consider curbing authority of federal regulatory agencies

Bloomberg News (TNS)

The U.S. Supreme Court accepted a major new clash that could curb federal regulatory authority, agreeing to consider abolishing a legal doctrine that has given agencies wide latitude to define their own powers.

The justices said they will take up an appeal by four New Jersey fishing companies asking the court to overturn the watershed 1984 Chevron v. Natural Resources Defense Council ruling. That decision said courts should defer to

administrative agencies when they offer a reasonable interpretation of an unclear statute.

The move sets up the court's next term, which starts in October, as a potential blockbuster for the power of regulatory agencies. The justices are already set to consider whether the Consumer Financial Protection Bureau's funding system is constitutional.

Justice Ketanji Brown Jackson didn't take part in the court's decision to accept the latest case. As is customary, she didn't pro-

vide any explanation.

Democratic administrations have relied heavily on the so-called Chevron doctrine, using it to justify mandates on energy, the environment and the workplace. The conservative-dominated Supreme Court has chipped away at Chevron in recent years but until now had eschewed any direct challenge.

The case involves a federal requirement that some vessels fishing for herring off the Atlantic coast hire monitors for conservation and management purposes. The challengers say

Congress didn't authorize the National Marine Fisheries Service to require fishing companies to pay for the observers.

"In a country that values limited government and the separation of powers, such an extraordinary power should require the clearest of congressional grants," the fishing companies argued. They say they could have to devote as much as 20% of their revenues toward paying monitors under the rule.

In upholding the monitor requirement on a 2-1 vote, a federal appeals court in

Washington relied on the Chevron doctrine. The panel said the rule was based on a reasonable interpretation of the 1976 Magnuson-Stevens Act, which governs the management of marine fisheries in federal waters.

The Biden administration defended the Chevron doctrine, saying it "promotes political accountability, national uniformity and predictability, and it respects the expertise agencies can bring to bear in administering complex statutory schemes."

In urging the Supreme

Court to reject the appeal, the administration said the fishery dispute has little practical importance, in part because the monitoring program is on hold for unrelated reasons. The government also says the four suing companies haven't shown they ever had to pay for a monitor.

The fishing companies' appeal drew an unusual level of support, as outsiders filed 14 friend-of-the-court briefs urging the justices to take up the case.

The case is *Loper Bright Enterprises v. Raimondo*, 22-451.

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OIL & GAS

NETL harnesses geospatial mapping to address orphaned wells

Newsroom@DominionPost.com

By embracing the 21st century tools and techniques of geospatial mapping, NETL researchers are developing new means of locating orphaned oil and gas wells so they can be plugged in the interest of public health and the environment. Plugging the orphaned wells reduces the release of methane, a potent greenhouse gas, into the atmosphere.

By estimates, there are hundreds of thousands of these orphaned wells across the country, many of which were installed more than a century ago, predating digital records. These undocumented orphan wells, or UOWs, are often in unknown locations and their numbers range from 120,000 to 800,000 across the country. The definition of orphaned wells can vary from state to state, but generally orphaned wells are defined as idle wells for which the operator is unknown or insolvent.

“Finding the location and characterizing these orphaned wells is critical to ensure safe and effective plugging, which will help reduce risks to the environment, climate and human health and safety,” NETL geo-data scientist Jennifer Bauer said. “Tra-

ditional means of locating wells can include citizen reports, use of historical documents and field-based data collection using drones equipped with various sensors and instruments, such as methane detectors, to find the wells on the ground.”

However, advances in technology have allowed for additional means to be integrated with these approaches, namely geospatial data. Geospatial data includes information about the physical location of objects, features and phenomena on the Earth’s surface, such as latitude, longitude, elevation and other key attributes.

“Geospatial data and analytics offer a way to analyze and understand complex spatial relationships between features on the Earth’s surface,” Bauer said. “When it comes to locating orphaned wells, field-based data collection methods generate spatial data that can be analyzed and integrated with additional geospatial data sets, including geological data, production records and other spatially referenced information to identify areas where UOWs are more likely to be located.”

Bauer’s research is leveraging geographic information systems to



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NETL researchers are developing new means of locating orphaned oil and gas wells so they can be plugged in the interest of public health and the environment. Plugging the orphaned wells reduces the release of methane, a potent greenhouse gas, into the atmosphere.

integrate known well records with digitized historic records, wells identified from field-based collection efforts and patterns in well development trends across the U.S. over time to help predict the most likely locations for UOWs, so they can be targeted for field-

based sampling and verification to inform state plugging strategies.

Geospatial data and analytics can also be applied to help reduce the overall area that must be searched with sensors or field-based crews to locate these wells. The technique also offers

insights into the potential environmental challenges detection teams and plugging operations might encounter when attempting to access these UOWs, such as dense vegetation, urban areas and road access limitations, among others.

The Bipartisan Infrastructure Law (BIL) funding enabled a collaboration between the U.S. Department of Energy and the Interstate Oil and Gas Compact Commission to develop a program to reduce the impact of UOWs. The BIL provides investments to plug these UOWs, which will help communities reduce methane emissions and eliminate other environmental impacts. The benefits of NETL research into orphaned wells include remediating environmental concerns, addressing legacy pollution that harms communities, creating good-paying jobs and advancing long overdue environmental justice.

NETL is a U.S. Department of Energy national laboratory that drives innovation and delivers technological solutions for an environmentally sustainable and prosperous energy future. By leveraging its world-class talent and research facilities, NETL is ensuring affordable, abundant and reliable energy that drives a robust economy and national security, while developing technologies to manage carbon across the full life cycle, enabling environmental sustainability for all Americans.

NETL

Study assesses Appalachian region’s potential for hydrogen economy

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The Appalachian region is well suited to be one of the nation’s clean energy hydrogen hubs because of its natural gas resources, infrastructure, storage capacity, workforce and industrial demand, according to a recently released report conducted by NETL.

NETL Director Brian Anderson said the report, “Appalachian Hydrogen Infrastructure Analysis,” studied how development of a hydrogen industry in Appalachia offers a path to sustainable long-term growth.

“The Appalachian region was hard hit by declining coal production, but hydrogen offers a path to sustainable long-term growth,” Anderson said. “With this study, NETL evaluated how the region’s current natural gas transportation and storage infrastructure might be adapted for use with hydrogen.”

An alternative fuel that has very high energy content by weight, hydrogen consists of only one proton and one electron and can be used as both an energy carrier and energy source. Hydrogen can be stored and delivered for energy just as natural gas or can be delivered to end users as a building block for chemical production.

According to the Appalachian Regional Commission, Appalachia is made up of 423 counties across 13 states and spans 206,000 square miles, from southern New York to northern Mississippi. The region’s 26.1 million residents live in parts of Alabama, Georgia, Kentucky, Maryland, Mississippi, New York, North Car-



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olina, Ohio, Pennsylvania, South Carolina, Tennessee and Virginia, as well as all of West Virginia.

The report’s authors said development of Appalachian hydrogen infrastructure will help create new clean energy jobs, revitalize distressed communities, advance environmental justice and help achieve the administration’s goal of net-zero carbon emissions in the electricity sector by 2035.

“Hydrogen is being positioned as a critical solution in efforts to decarbonize the

global economy,” according to the authors. “Hydrogen produced from fossil energy can be a bridge in the clean energy transition. The study demonstrates that Appalachia has the resources and infrastructure in and around its borders to lead a clean energy revolution by using natural gas with carbon capture and storage to produce and store hydrogen.”

The study concluded that hydrogen could replace fossil fuels in many aspects of the energy economy, delivering high-quality

industrial process heat, on-site industrial electricity generation, large-scale electricity generation, transportation and as a building block for thousands of downstream chemicals. While there are multiple pathways to produce hydrogen from water, biomass and hydrocarbons, the most economical way is currently from natural gas through steam methane reforming and autothermal reforming.

The study noted the region possesses enough natural gas resources to

feed a hydrogen production future.

“With a combination of energy exports, long-term reduction in natural gas consumption for electricity through grid decarbonization and utilization of biomass opportunities to produce renewable natural gas, there would be a significant amount of natural gas as feedstock for hydrogen production plants in the region,” the study reports.

Hydrogen storage potential was also highlighted by the study, which noted “there is enough potential CO2 storage for 60 plants producing around 550 tonnes per day to last 28 years.”

The study specifically notes the region also possesses sufficient pipeline, truck, barge and rail distribution infrastructure to grow a hydrogen economy from the region’s abundant fossil fuels reserves.

The study estimated the number of additional jobs by area that could be supported by advanced hydrogen infrastructure development for every million dollars in output generated by industries involved in the hydrogen supply chain. The estimates included:

- Oil and gas extraction: one job per million U.S. dollars (\$M) in industry output.
- Mining support activities for mining: four jobs per \$M in industry output.
- Utilities: one job per \$M in industry output.
- Petroleum and coal products manufacturing: four jobs per \$M in industry output.
- Chemical products manufacturing: three jobs per \$M in industry output.
- Fabricated metal product manufacturing:

NETL’S HYDROGEN RESEARCH COVERS A RANGE OF TOPICS ASSOCIATED WITH THE DRIVE TO PUT HYDROGEN TO WORK TO MEET THE NATION’S ENERGY NEEDS AND DECARBONIZATION GOALS.

less than one job per \$M in industry output.

■ Computer and electronic products manufacturing: one job per \$M in industry output.

■ Rail transportation: two jobs per \$M in industry output.

■ Water transportation: one job per \$M in industry output.

■ Truck transportation: six jobs per \$M in industry output.

■ Pipeline transportation: one job per \$M in industry output.

■ Warehousing and storage: nine jobs per \$M in industry output.

NETL’s hydrogen research covers a range of topics associated with the drive to put hydrogen to work to meet the nation’s energy needs and decarbonization goals. It also maintains a hydrogen production, transportation and storage research portfolio that makes it a key player in U.S. Department of Energy (DOE) initiatives to put hydrogen on the front lines of the effort to attain net-zero carbon emission goals in the power sector by 2035 and the broader economy by 2050, while meeting DOE’s Hydrogen Shot goal of \$1 per 1 kilogram of hydrogen in one decade.

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