Rachael: Hi, everybody. Welcome to HI-TEC 2021 virtual.

My name is Rachael Bower, and I am with ATT central -- A TE Central, and I am pleased to be the chair of the HI-TEC committee this year. We are so happy you took the time to join us for two days for action-packed programming.

We hope you will enjoy our wonderful event and wonderful lineup of speakers today and tomorrow.

At this time, I would like to welcome Dr. Celeste Carter, lead program officer for 8 ATE.

A big thank you for continuing to support HI-TEC. I will now turn it over to Celeste for some welcoming remarks.
Dr. Carter: Thank you, Rachael.

I would like to add a welcome to the people who are registering as we speak to the high-impact technology conference.

This is the 13th year for this conference to be going on, and it came about through the ATE community.

We have a principal investigators conference every year, but many of the members of the community decided that was for people who already had awards. They wanted to reach out to industry and education, people who did not know about this program and convince them that this was a wonderful opportunity to consider.

The ATE program has been around for a while now. It was congressionally mandated and signed into law in 1992 with the scientific and advanced technology act, so quite a while for the National Science Foundation to have an ongoing program. It's an interesting program, because it does something that I hear industry asks for a lot --
industry often will they, there is a real disconnect between
what is happening in the academic education world
and the kinds of knowledge skills and competencies we need
in our employees. That can kinda be across the board.
But that act mandated the National Science Foundation to
start a program that focused on the skilled technical workforce,
and that is the latest term for it. You may have heard middle
skills jobs, blue-collar jobs, no caller jobs.
There's a lot of different definitions, but the idea is for
all of the industries where technology is advancing
rapidly, changing the kinds of knowledge, skills, and
competencies needed by both incumbent workers and potential
new employees.
The ATE Program focuses on two-year institutions to educate
that skilled technical workforce, which is workers that
need generally more than a high school degree now, but not
necessarily a four year baccalaureate degree. That's the
focus of ATE. Because of that space, Congress
said, this program should focus on two year institutions of higher education. The community and technical colleges across the United States. That's the focus of a TE.

Jumping back to the high-impact technology conference, I see this as a real example of where the National Science Foundation positions itself as a catalyst for innovation, change, research and education. I think that the high-impact technology conference is a great example where the centers got together -- if you noticed the sponsors, quite a few of them were different ATE centers. They got together and said, this is something the entire nation needs to know about.

Partnering industry and education, developing and educating a workforce that industry needs, impacting economic development regionally -- all of those things are things that have come about based on the catalytic action of the advanced technological education program.

So my job then was to welcome you today. I would also like to
say, I know it's more difficult in a virtual environments, but

still possible to network. I think about different ideas

and projects you might have, given the basic information I

have given you about this program.

Please go to the NSF.gov website.

With that, I will just say welcome again. I know it is

going to be an exciting conference. I will turn this

back over to Rachael. Thank you.

Rachael: Thank you so much, Celeste.

I know we might have a bit of time for a question or two. Can

you tell us a little bit about the solicitation you just

mentioned? I think people are excited to hear about that.

Sure. This is an opportunity for institutions

with their industry partners to develop consortia together.

One idea came to me when we had

people in the ATE community getting calls from across the

United States -- they had awards that were
supporting them in developing the hybrid and electric vehicle programs. What I heard from one of the principal investigators was, we are getting swamped with calls from other institutions that want to develop these programs. How can we all work together? We don’t think if you get 10 to 15 proposals that say the same thing, that’s going to go forward. That started me thinking about how we could support different types of consortia. This new track in the HTE solicitation will do just that. The maximum budget could be 1.2 million over a period of three years. If there are more than two institutions, the maximum budget could be up to $3 million over three years. Hopefully we will get a lot of responses to that. One other thing to mention quickly, the ATE program was reauthorized this year. It was bipartisan support across the board, and they plan to double the ATE budget. It is currently at $75 million a year and the authorization – that’s not appropriation, but
the authorization says the budget could go to $150 million a year.

All of you thinking whoa, industry education partnerships, oh, working together, now is a great time to think about crafting a proposal.

Rachael: That's exciting, to hear that the budget could go up so much. That's great.

A little scary, a little exciting. I wanted to ask you one more question -- since you were talking about people turning in a proposal and I suspect this question comes up a lot, what does NSF want to see in a proposal? If you could give people a little bit of information about that?

Dr. Carter: It's a great question. I get that question a lot. I think really, the best response to that, it's not necessarily what NSF wants. We try to give you an idea of the scope of the program and its
solicitation. But it's really the partnerships between industry and education, and what does industry need in their workforce and skilled technical workforce, and how could you breast craft a project that a panel of your peers, because NSF works on the merit review system, so your proposal will be reviewed by a panel of up to six people.

Could be, will be people from a two-year institution, possibly a four year, maybe even high school, right? Industry.

That set of people need to see the intellectual merit, first of all, in your proposal. As long as that review process goes well, then the program officer steps in to look at the proposals and kind of look at it across the portfolio that we have supported so far.

Rachael: All right. Thank you so much, Celeste. It was great having you welcome us, and we are excited to get started with today's program. As moderator for this two day event, I have some very important people to think.
And of course -- to thank, And of course, a few housekeeping notes.

I want to thank cCORD, who plays a big role in putting the conference on, specifically Sheila Wilson, who somehow keeps all of us moving in the right direction. We also want to thank those who support our conference by purchasing institutional level registrations. You can see their names on the slide.

We have our executive level supporters, our medallion level supporters, and our associate level supporters. Thank you to all of you, thank you so much. It's so important. Of course, we want to give a big thank you to our sponsors also.

Our old bubble sponsor is --

gold level sponsor is Biotivity, and our bronze level sponsors are BioMade, Carolina, --, and Innovate Bio.

Don't forget the 80 plus on-demand sessions. You should have received the link and password on Monday to access those sessions, and if not, we will put that in the chat box.

You can also contact Sheila Wilson, and she will be happy to
resend the link to you all. These on-demand sessions are available for viewing for the next six months, and you should have received a note about the speakers and panels. You are welcome to turn on closed captioning if desired, and you may want to put your zoom settings in side-by-side mode. This will help as you are viewing our sessions today. At this time, we will hear a pre-recorded session of our opening keynote, Mark Maybury from Stanley Black & Decker. He manages a team across the company's businesses and functions, and provides access to all elements of the global technology ecosystem. We look forward to hearing his presentation on the future of work for those who make the world.

Mark: Thank you so much. It's a pleasure to be here today on behalf of the 60,000 members of Stanley Black and Decker. It's a pleasure to talk about the future of work for
those who make the world, which is our purpose.

Stanley Black & Decker is a 170

eight-year-old institution that responded with a focus on

providing improvements to individuals lives. Tremendous

advances have been made in the world since he

first established the Corporation, and interestingly,

not only did he bring power to New Britain and start the

beginnings of businesses like

what we know today, for example, but also, he contributed as a

member of society.

A great individual who supported those who made the world,

becoming New Britain’s

first mayor and bringing a real wave of electricity into his

community. The illustration you see here

in the middle, that was someone who at the time, a few years

after Frederick Stanley established Stanley, hand tools

and subsequently power tools, used literally his hands as an
immigrant from Russia, built a business, 25 miles north of

where I am talking to you from today, from the factory of the

This is William Maybury, who was actually my grandfather. He

immigrated. You can see his draft card there -- he came from

Russia. Many Americans, he was able to

literally leverage the tools to make a better future for himself

and for others. Today, we maintain that tradition, that

history.

In 2020, with $14.5 billion corporations supporting the

tools that you know, when you walk into Home Depot or Lowe's.

We make half a million different kinds of products sold in

hundreds of companies around the world.

We also do some things that you probably don't know us very well

for.

We have brands like Dewalt and craftsman, but also have a

number of businesses that are quite interesting that help us

understand the makers of the world. In the industrial
business, nine out of every 10 cars and trucks, trucks on the road today are held together by robotically inserted fasteners.

We also have an incredible security and health care business. For example, we protect a couple million mothers and young babies via our hugs IOT devices, so we make sure no babies or mothers get lost in the hospital. We also provide a very interesting set of sensors and capabilities to help people age in place.

For example, we have one AI based sensor that is able to see 30 to 40 seconds ahead of time to see if an adult, an elderly adult is going to fall. That technology is part of our purpose. You can see in the upper left-hand side of the graphic, we aim to be a $20 billion company with 20% margin by 2025, by focusing on performance, being a world-class
innovator and doing that in the socially responsible way. And yet the world is incredibly challenging. It's volatile, complex, and ambiguous, yet companies that can provide and vision for the future, and we will talk more about talent in just a moment, providing purpose, innovation, social responsibility. But can also provide unity of effort, unity of vision, and that includes leveraging all the potential talent that is available.

We know from studies that a more diverse and inclusive organization, both at the top in terms of the board and executive leadership, but also through the organization on the bottom results in about 2.6% for after -- faster growth and 4.6% higher share of return. Being diverse and inclusive ends up being economically beneficial as well. Also, in this complex world, you want to provide clarity, simplicity, and extraordinary customer experiences. Finally, if we have learned anything the past few years, we
must be much more agile.

We learned to do this, to achieve our purpose for those who make the world and to achieve that vision of our financial performance,

innovation and social responsibility, we need to have leadership. We need to create clarity, inspire engagement, and grow and deliver. We will talk today about extreme innovation, which can enable extraordinary experiences

by our employees, but also through our employees into our customers' lives we also focus on excellence in operation with everything enabled, which oftentimes are balancing things. Being able to change the mold,

but also be very humble and disciplined to the court to make sure we deliver. That delivery has been pretty incredible.

40 plus innovation awards since 2020.

We have innovation and applications and technologies, lifestyle products such as electrified outdoor products.
New technologies and digital solutions as well as safety, similar things that I mentioned previously. You noticed tens of thousands of new products being launched with a significant high vitality rate. How we do that is through our innovation ecosystem, which I would like to share with you a short video about so you can see it in action.

Extreme innovation is in our DNA. From the invention of the cordless power drill to advanced aviation solutions, our legacy as defined by a history of innovation that spans nearly two centuries. To ensure our legacy lasts as long as the innovations that define it, Stanley Black & Decker's building an innovation culture across the company, across the world. It is purpose driven and fueled by a passion to recognize positive social impact. We empower our employees and customers' imagination to be brave and bold. We empower diverse employee resource groups to break down
walls and build an environment where ideas thrive. Our innovation ecosystems shapes our global innovation culture. This introduced world first innovation, such as flexible batteries, it, it -- atomic and extreme power tools, and advanced security sensors through breakthrough innovation. It is revolutionizing our businesses and factories through artificial intelligence, advanced analytics, and industry 4.0. It invests in the most disruptive ventures and our tech stars advanced manufacturing accelerator in Hartford, and Stanley X-Unit in Silicon Valley. We foster innovation by everyone, everywhere. We democratize innovation, upscaling and re-skilling makers and innovators across the globe. We are linking the company internally and externally with universities, corporations, and venture capitalists across the globe to accelerate commercialization of
innovations. Because we can go quickly, but together, we can go far.

Stanley Black & Decker’s ever evolving extreme innovation culture supports the innovators of tomorrow, because we offer those who make the world.

-- are for those who make the world.

Mark: It’s a great honor to work for this corporation. But we are all empowered by people. Through the pandemic, we kept three key priorities in mind for those individuals. Number one, ensuring their health and safety. Both themselves as well as their families.

We literally shipped products, masks and sanitization capabilities to our employee families, because we know we live in an ecosystem. Also ensuring business continuity, both operational and financial this and so we can maintain strong for our employees, but also to ensure we deliver to our customers within disruptive environments.

Finally, doing our part to mitigate the spreading of
coping -- COVID in our communities. We invested $10 billion, half of that to employees and their families, to ensure that they could weather the storm.

We also added more in terms of the Covax initiative globally to support vaccination globally.

It's important to recognize that this challenge we've all gone through in this redefinition of work in the future taught us a number of important lessons. One of them they taught us, we absolutely need to do certain things in person.

You have to bend metal for an aircraft or a car, you have to do that in a factory and deliver materials through a supply chain. It's also the case that you could potentially think about doing new things in a hybrid fashion. As you can see, the 10 observations of benefits of hybrid work, we realize through this process, including increased employee creativity and productivity -- I will give you some examples of that in a
minute. Hyper personalized experience based on the needs of the individuals, focusing on the needs of the customers.

When you are working virtually, you do not necessarily need to be in the office. If you can support that activity virtually.

Certainly activities like design, finance, HR, engineering, most of that can be done from a distance. That can reduce the cost of real estate and unlock new funds using those monies to provide benefits employees need.

You can also support hybrid teams and their engagement in new and innovative ways.

I'm privileged to serve as the sponsor of the villages group, which we call instead of the disabilities group, because we find people have differences in cognitions actually provide us more neuro-diversity. They do certain things better than others. For example, those who are on the spectrum -- my granddaughter is on the spectrum, she is ahead of the kids in her class. Why? She pays very close attention to things.
that are going on around her. What we discover is whether it be in analytics or computer security or a variety of areas like design, individuals -- this is just one example, on the spectrum can have unique cognitive skills. If they happen to be physically disabled, if you are working virtually, they have access to a potential talent pool that you never tapped into.

We also can look at work products that are based on evaluations, goal or outcomes as opposed to activity. A very important advancement for business. Focuses on time for wellness and his men chilly mental health, something we learned in the process. Reducing our carbon footprint, because guess what? People are not on the road as much as nature is coming back.

By taking advantage of our increased attention to both hybrid, in person, and remote work, by providing better connectivity, we can strengthen alignment and accelerate motorization.
Just because we are in a challenging situation does not mean we cannot provide a whole bunch of benefits. By the way, we did specifically in innovation. In three weeks because of joint attention and a collaboration with Ford and 3M, we took our batteries and were able to adapt them and their chargers and design in three weeks and build very quickly over the set of months 40,000 units of air purifying respirators. We do engineering fast. We produced 30 engineering fasteners for ventilators, beds, field hospitals and so on. We were also able to work with one of our companies that we are accelerating, and took a company, dynamic green products, that was making eco-friendly lubricants and materials that would be substitutes for standard petroleum-based products. They were able to create a brand-new product that is now sold at Home Depot, basically hand sanitizer that exceeds
federal requirements for sanitization. Finally, we
mentioned we track a couple
million babies and mothers per year. We took that tracking
technology and applied it to our plants.
At one plant in Britain, one of the manufacturing plants that I
referenced from Stanley's original business, we were able
to track individuals and provide proximity warning with visually
acoustically -- both visually, acoustically, and vibratory Lee.
-- vibrator ally.
The point here is that the
speed and skill was all enabled by this challenging situation we
find ourselves in. When we talk about the future of work,
clearly, one of the things that will drive the future of work is
artificial intelligence, robotics, analytics.
It is argued that by 2023, a
2014 builder and dollar -- 214 billion dollar market.
We focus on a couple of key areas, as you can see in the
number one area here, analytics, automation, and the connected factory, enabling digital applications.

We focus on working together with others in an ecosystem, working to give them a bunch of innovation leaders as well as plant champions and business leaders to enhance various technologies at scale within our plants. We prioritize the technologies for impact, and finally, we create an innovation marketplace.

For example, just like on your iPhone you can add apps into the app store, we have an app store for Black & Decker. One thing we realized is we would have to work with a bunch of experts, so what we recognized, pulled together with the Association of advancement for artificial intelligence, we pulled together industries across academia and the government, from the National Science Foundation, the University of Virginia and others, and a variety of organizations. We defined a roadmap that would ultimately allow us to advance
over the next 10 years artificial intelligence for manufacturers. You can see in this roadmap,

the one on the left is about enhanced data and modeling, the

one in the middle is about innovation and robotics, and

finally, technologies at the ecosystem level, where humans

are engaged with the machines. Such that they can be upscaled

and rescaled and become more

symbiotic in a safe and sustainable fashion, such that

we can get the kinds of benefits that we would like to

achieve from both human intelligence as well as coupled

with machine intelligence. This has got to be done with a bunch

of experts in collaboration, whether they be

academia, industry, the government. We have actually

published the roadmap. You can see the site above, all

the papers and presentations were developed and actually used

to accelerate a set of 10 companies that we accelerated

during the pandemic.
We were in this workshop in March 2020, and we created a team of companies that we could accelerate working partnership with tech stars in this area. I would like to bring you into our plants so we can see how artificial connectivity and analytics transform the factory into the future of work.

In April 2019, Stanley Black and Decker opened a 23 thousand square-foot advanced manufacturing center of excellence called manufacturing 4.0 in downtown Hartford, Connecticut.

Everything is representative of what we can, will, and have deployed in our sites. The dangerous aspects of the job at our sites has been replaced by collaborative robots. Technology enables us to remove the elements of on safety and inconsistency that provides our workforce with the opportunity to upscale to a productive task. We have representations of
these performing various activities, performing tasks

that require some amount of dexterity along with pick and place applications. We also have robots on automatic conveyors, while seamlessly coexisting with people in the same environment.

Another key focus area has been connecting our factories for data streaming and analytics. Hybrid cloud and edge architecture enables us to view tactical insights driven by underlying AI models. The robustness of our approach enables data accessibility from the plans and their respective geographic regions, back to our center of excellence, aptly named the nerve center.

Our work with cyber physical representations of aspects and processes runs the gamut. We have simulation models with value streams, processes and equipment. In general, data is streamed back to the twins to enable real-time visualization, as well as predicting likely outcomes, such as failure of
operational performance and optimization opportunities.

These are made available for implementation at our sites through the app store.

As part of this effort, we continue to innovate the use of augmented reality for training programs. The center serves as an innovation, helping Hartford continue its evolution as a leading market of advanced manufacturing.

Mark: As my colleague explained, there are a number of key use cases that can transform the nature of work. First and foremost, you see the use of analytics. They call it the state of the machines, predictive analytics as well as prescriptive analytics that can tell us how to optimize those machines.

A quick return on investment in these kinds of investments, connecting your plans in the beginning to analytics.

Similarly, we have the dull, dirty, and dangerous tasks. We don't want to have people waste their time carrying physically
heavy things around

plants -- we produce $1 -- one billion fasteners per year.

Similarly, we are going to want
to use cooperative robots to do things like take away the
ergonomically competitive tasks from the worker so the worker
can spend their time on tasks that required fire and are --

that require finer dexterity and vision. We want to build these
solutions and scale them globally.

One of the things you might think about is, wait a minute,
are these innovations going to replace jobs. The answer is yes.

But as you can see right now, we are suffering trillions of
dollars of loss because we have millions of jobs unfilled.

Right now, we have thousands of open positions in our company.

People want to work at our company, but we are growing to
Whitley because we are meeting the need for higher talent Gil
at the company. So there will be a need for
more people in the future, not fewer people, but this data
shows this -- if you look at personal computers, a study did

at the end of 2017 said it destroyed certain jobs, like a
typist, but created many more.

A study looked over a longitudinal 10 year period and

found that companies that did not invest reduced in -- by 20%.

Those who invested them them --

and them increase climate by 40%. So what have we done?

Obviously, this is a partnership. We need government
to help working with the business and higher education

form. We have helped influence and guide the new programs that

universities and colleges -- yes, trade schools, need to
develop so we have a pipeline of workers coming into the

workplace. We also have to make it so everyone believes, because

it is true, that careers in manufacturing can be not only

lucrative, but exciting and high tech.

It's not the jobs of our forefathers. We need to collect
the skills, the well-being, the leadership.

We have several leadership programs where we have
rotational assignments, where we focus people on a lien project -- lean project.

We also work with some of the largest retail and commercial customers in skills and sales marketing. We have also introduced a vocational leadership program, which taps out folks coming out of high school into a development program where they can learn individual practices and be exposed to top executives, so they realize there are great positions there.

For example, we need someone to maintain and design a robot and so on -- you can see our vision for the future, where we have visions of scaling and upscaling. We have a collaboration with the number of universities, and there are different levels of scaling.

Operators working alongside on robots, and in those are
reproduced to do higher-level work.

Ultimately, a leadership where in the future, our leaders will have to be combined human-robot team leaders.

We were talking about ratios of humans to robots. We have one human to two robots, four robots, because those individuals will need to be upscaled.

As you can see, they analytics, industrial things, this will help create those higher skilled jobs for the future.

Something else that is a viewpoint of the past is, everyone should go to university.

That's where you can make a lot of money. But if you look at it and we have done some analysis, you can see that yes, get that.

If you pursue and apprenticeship, one, it does not preclude you from getting anything, but more importantly, it allows you to get access to high paying jobs that provide a lot of value and a lot of wealth.
In fact, we need to recheck our math in terms of, are these working opportunities not as preferable as we think they are?

If the case that we have created through our Stanley X into baiter -- Stanley X innovator, it allows individuals to profess their skills, but also find opportunities for themselves and the trades. We have realized we want to upscaled people within our plans and another -- plants and in other plants.

We have technology that was accelerated in an incubator, accelerator with tech stars and invented basically with the technology that uses computer vision straight from a simple cell phone, together with natural language processing and translation, and transported across the world.

It reduces training time and improves performance. Rather than tell you about it, let's show you a short 8:00 of it in action.
As technology continues to rapidly evolve, people are learning in new ways. Turning to more engaging resources online. As long-term employees move towards retirement, it's vital to capture their expertise, they are of the trade and know-how.

Transferring their valuable skills to the next generation. This is the first AI solution for learning and training skilled trades.

It captures their workflows via a mobile device. Using the latest AI technology, this captured data is extracted and ingested, turning complex workflows into easy to follow guidelines.

Stephanie, show me the bleeder valve. Stephanie, speak Spanish.

Employees can access training information anytime, anywhere,
from the portal, learning tasks at their own place without disrupting other workers or playing operations.

We are celebrating learning and increasing opportunity with everything they need for success.

Mark: So one of the important things, in addition, just to make folks aware, some of the work we have done with the world economic forum, led by some work that Carl marches doing within our industry, it's taking assessments of these industry technologies, whether they be cooperative robots, technologies such as this and others, and bringing them to small and medium enterprises by helping them support and assessment by using some technologies that came out in Singapore, our methods came out of that country, and helping them understand where they could find value and also how they could upscale their own talent base so they could compete on a global scale.

Importantly, as we already referenced, innovation is
enabling and empowering by diversity and inclusion. We have

been very, very fortunate to be recognized as

an organization that gets extraordinary value out of our

innovation, but also wrecking rises, according to the Boston

consultancy group study, we

actually can get, companies get 2.5% more growth and .6% higher

shareholder return if they have a more diverse and inclusive

workplace.

In closing, as you have seen, we have a tremendous passion

for those who make the world. A tremendous passion for the

work base of the future, which will be human centered.

So that means, you are going to be at the center and your

children will be at the center, your grandchildren will continue

to be. One thing I would like to close

with is lessons I have learned about future-proofing yourself.

If you are going to be at the center and we all are going to

be at the center, we want to be relevant.

First, if we look at the great discoveries in history,
hydrodynamics by da Vinci, it was inspired by close observation of rivers. Flight machines were inspired by the properties of birds. Finally, if we look at great arts, my understanding of the human -- by understanding of human biology.

Edison solved everyday problems with my favorite invention, the invention that helps you invent the laboratory.

When oil is like to remind folks is if something irritates you, more than a pandemic, a massive disruption, those are opportunities. Look for ways that you can convert that human pain into a great ability to serve humankind. Think outside of the box. When you think about Tesla’s ideas of wireless electricity and man-made lightning, observing it in nature and thinking about something completely radical. Ford, who came here to see how we have done lecturing, was able to transform the assembly line.
He doubled the salaries working from two dollars an hour to five dollars an hour, which was unheard of at the time, but he had to address the economic divide at this time and, it turned out he not only skilled his workers, made them more valuable, but turned them into consumers and virtually enhanced of the market. The four I was talking about about how -- we want to experiment with purpose.

If we take a look at federal government, which invested in flight, all the federally funded individuals did not actually create flight. It was a couple of brothers in Kitty Hawk, who were committed to the scientific method and focused on an outcome and achievement, was created the flying -- and created the flying machine.

Leonardo, Franklin, Edison, all of them were Renaissance people and were inspired by art, literature, were inspired by nature, people. Those interdisciplinary intersections
and the diversity that, in the history of humankind, now have planetary global access, we are to leverage that diversity and put it do good work.

My final message to all of you would be, back to my favorite proverb you heard in one of the videos, the African proverb that says "if you want to go fast, go alone. But if you want to go far, go together." We are Stanley Black & Decker, for those who make the world. We are excited about the future and know it will be people centered.

We know you will be important too. With that, thank you.

Mike: I really appreciate your insights and the close look we got inside Stanley Black & Decker. Thank you. I have the opportunity to ask you a few questions, if I could.

Mark: Please. Mike:

Many of in technical education, preparing people going into automation, I.T. skills, that range of things.

If you had to put on your crystal ball and live a couple of years out, what should we be
Mark: I think we should be building learning machines, both human and digital. I happen to be a 40 year veteran of artificial intelligence, and it has extraordinarily impressed me, the progress we have had, but it also depresses me, because some wisely misuse -- sometimes we misuse. I want to upscale the talent so it Unser stands the scientific method. As you saw and some of the videos, digital twins will enable us, whether it be humans or machines or world environments, this will all be very important for us to understand in a deeper way the mechanisms, the processes. I think there will be a need to understand digital. Clearly, there will be new areas, a new materials and cereals signs that we knew kinds of intelligence that RAV more --
positively base d. For example, when we think of quantum
technology, the physics

space, it is a technology that river than things at the
molecular level, because like super precision, which allows
us to model chemistry and biology. The environment.

The worker of the future is going to be empowered in a way,
for example, if you think about before cars, it's hard to
unimagined things.

But you have to look back, the further forward you look to the
future, the her back -- the further back you should look at
the same time. Downtown Detroit, when the first cars appeared and
it was horses for 10 years, then it

was all automobiles, we needed people to repair the
automobiles, gasoline, driving schools -- everything was
transformed. It's very difficult for humans to is the page what a
world might be like in the future.

Given that, critical skills are -- ability.
It's a long-winded answer to your question, but a great

question. I think it's ultimately up to

us as leaders and as educators to create a workforce that will

be continually learning.

Mike: If I am at a two-year college, maybe I should put in a

course like intra-artificial intelligence? Should I -- intro

to artificial intelligence? Should I put that in?

Mark: I would even say it is going to be at the point where

it is at the high school level. We will need people to have

digital and data analytics competency.

10, 20, 30 years ago, we said everyone needs to understand how

to use a computer. We don't really say that today, because

my three-year-old granddaughter has a computer in her hand.

She is surfing and searching -- how is that possible? She grew

up in a digital world.

We have built interfaces that allow humans, they are more

social interfaces and huge, main interfaces. That will become

more and more the case in the future -- you
talk to your car, you talk to your refrigerator -- we are already talking to RTV's. -- two hour TV's -- to our TV's. We need to teach those skills so people can exploit that work. You need to be able to search well on the Internet, but you also have to learn how to call out the bad stuff, the stuff that is not relevant or just misinformation. Those are the important skills in the future.

Mark: One of the things you stressed today was upscaling of employees. Many community colleges offer collaborative education with our industry partners to help them, but you painted an interesting picture. Remember the diagram where you had the upper writer come in. As they moved down the curve, there were gradually taking on more responsibilities and so on. Now, where would you like a new hire to come in on that curve?

Say they come in with an Associates degree in manufacturing. Where would they come in along that curve?
If they come in with an Associates degree and have had some exposure, I have never seen a -- before. They are already going to be at level two or three. They are not going to be level four, but they have an opportunity to accelerate themselves to a two or, if they are an extraordinary student and at night they are tinkering with and modifying code and so on, they could be a programmer. That’s the wonderful thing about our world. You are limited because of the access to online information to online training. Everything from con Academy to teachers at your community college to course -- Cors ero work. For community colleges, I love the accessibility and the affordability of them, and also the relevance of them. These are strengths that are unique to that segment of the education system, that again, if the great workers are going
to be this new, powerful source of talent and value, community colleges are at a beautiful position to ride that kind of skill and education. This is one of my conceits, you know?

I have a PhD and I'm a professional student, right? One thing I did not realize, I was educated in Germany. When I was visiting the Eurocopter plant, I said, I don't understand how you could send your kids, force them when they are 14, 15 years old to choose to go and be an apprentice. He said, what did you mean? Why would that be a bad thing? They are committed and stock -- new -- stuck.

One, you assume that's bad. This is a lucrative career. Two, 60% of them go back to university and get a degree. I've had this completely wrong model of lifelong learning -- I hadn't yet appreciated that there was a continuous opportunity. Do your point, they can come in wherever they can advance themselves, because it will be a world where you are
competence -- where your competence and performance the
sting wishes your outcome.

As a friend many, many years ago in the Air Force told me, he
said, your altitude is ultimately determined by your
attitude.

Mike: That's good. Mark, I read an article by you,
where you said "we need to rethink this singular focus onour year education." That pretty much sounds like what you
are talking about, like there is a different set of opportunities
here.

Mark: There is. I think we do our children a disservice if we
don't show them the full spectrum of opportunities.

That's why I put that economic analysis.

Go to a four-year college, a community college with a
two-year degree, go to très school -- trade school.

I literally can remember my wonderful parents committed to
education, when I was in high will, saying it is a
million-dollar differential. You make more money.

Yeah, but you have to put in $1 million too because education has gotten so expensive. In the end, it is not clear that it is the best choice. Individuals have to make their own choices.

The most important thing is to dive in, to get skills, and to make yourself valuable in these areas. I do think we are going to have to continuously evolve our curriculum so we realize. We may realize, as we have today -- it's interesting, some people are saying, I am not a computer programmer, then you look at the industry and realize 50% of people in the computer industry don't program. They are customer service, they are doing program management, they are doing all kinds of supply chain negotiations, contracts, finance, etc.

Again, we have to question our assumptions because the world changes so much that we need to continuously reform our minds.

Mike: It seems to me that that is the expectation at Stanley
Black & Decker. That is an overt expectation. Is that true?

01:08:49.000 --> 01:08:52.000
Mark: It is absolutely true.

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Our CEO and president articulates that -- our CEO,

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our president, and CFO articulates that come and invest

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in that education. You saw that in the leadership programs we

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have. A key aspect of all of those is

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you have to continuously work.

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It is a reality of the world where scientific knowledge and

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the world itself is evolving so rapidly, probably unprecedented.

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You look at the number of

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publications, and importantly, foundational technologies that

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accelerate change. If you look at artificial intelligence, they

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accelerate change because instead of just

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looking at -- Tesla looking at one car, they have a million

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cars.

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The CTO of Tesla said two weeks ago that we are removing

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lighters because we believe vision is

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enhanced enough -- I personally like them to my car, I'm not
about to take it out.

But his view is it's good enough. What does that tell you?

It tells you we are getting to a stage where there is so much data can and you think about revolutions in medicine that would be possible with my genome and your genome, 3 billion pieces of data in our genomes are now available.

It is an incredible enabler for new medicines, for people talking about longer life because of that.

If you think of Stanley, the typical age was mainly -- I think it was 35 years or something. Age expectancy in the 1800s was low.

It is not upwards of 75, 80 years, completely doubled.

I think things will be very different in the future because of -- will change even faster because of some of the evolutions.

Mike: Mark, thank you again on behalf of the high-tech
conference. Thank you again.

Mark: thank you, Mike. Pleasure to be here commend the best

wishes to you and others as well.

Rachael: Thanks so much to Mark for that wonderful keynote. We

will take a short break and we will be back at 1:10 to hear from industry leaders featured

on our industry insights, new technologies, new opportunities panel. See you all in a few minutes. Bye.

Welcome back, everybody. We are so excited to hear from

my first panel on industry insights, new technologies, new

opportunities it is my great pleasure to turn things over to

Dr. Mary Slowinski, as she introduces our first panel.

Mary: thank you, Rachael. Welcome, everyone fe dead been

a pleasure to work with and coordinate these panels and

select panel topics and recruit our wonderful participants.

I would like to thank the live session subcommittee members who

came from across our community to help with this work it onto
our first panel. It is my pleasure to introduce

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our moderator, Dr. Mary Russell, training specialist for quick

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medical.

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Dr. Russell, good morning, or good afternoon.

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Dr. Russell: Thank you for the introduction. I am honored to be

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part of a panel that has three people

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representing different industries who are willing and

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excited to share with us information on their particular

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industries and what we can do to prepare technicians who will

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have to engage in the human machine interactions that will

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come with the emerging technologies. But I would like

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to do first is introduce all of them by just giving their name

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and the company they work with and I

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will ask each of our panelists to share information about

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themselves and their industries after the three have been

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introduced. To begin with, I would like to introduce you to

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Lisa Masciantonio.

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Lisa comes to us from Advanced Robtics for many pattern. Hi,
Lisa.

Lisa: Hi, Mary. Thanks for having me.

Dr. Russell:

next we have Geoff Foster with Core technology molding

conversion. Welcome, Geoff.

Thirdly, we have Dustin Heath, and SuDustin is representing

vigilance and persistence. Hi, Dustin, how are you doing today?

Dustin: I'm doing great, thank you for doing this.

Dr. Russell: Lisa, can you tell me about yourself and the

company and industry you represent?

Lisa: Absolutely, thank you. My name is Lisa Masciantonio,

and I'm the chief workforce officer for the advanced

robotics for manufacturing Institute.

The ARM Institute is one of 60 national institutes that were

set up over the years by the U.S. government to focus on

advancing research and technology, establishing and

growing manufacturing ecosystems, and securing human
capital. Across these institutes, we are all set up as a public-private partnership, and each of us has a distinct technology field on which we focus. But we all have a common goal during the future of U.S. manufacturing through things like innovation and collaboration.

The ARM Institute's focus is on robotics and automation. We recounted out of Carnegie Mellon in 2017 -- we were founded out of Carnegie Mellon in 2017, and we leverage our robust and diverse ecosystem of over 300 member organizations that are set up across the country, and it is made up of industry, academe, and government. Our key focus across those experts is to make robotics, autonomy, and artificial intelligence more accessible to U.S. manufacturers from the large, medium, and small sizes. We are focused on training and empowering the manufacturing workforce as well as elevating
the national security and resilience.

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Dr. Russell: Thank you, Lisa. Dustin, what can you share

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about yourself and vigilant cyber systems?

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Dustin: I'm the chief operating officer

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of a Cybersecurity firm called Vigilant cyber systems. We

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focus primarily on DOD Cybersecurity contract and are

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working closely with the Air Force and Navy to help secure

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their critical operational technology assets.

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The key distinction between information technology and

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operational technology is that we're not really focused on the

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computers and the laptops, but more of the industrial control

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systems, embedded systems, weapons systems, aircraft,

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things like you have probably seen in the news recently, oil,

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energy sector, midstream, upstream, downstream energy

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sector assets, maritime assets, cruise ships, things like that.

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Cybersecurity, as we bring this

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Internet of things online, the Cybersecurity of the connected

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world is becoming more and more of a target for hackers.
We specialize in that area, and it is a great place to recruit, and it is an awesome place for especially community college students to look at, because there is a massive, massive workforce shortage coming in this area, and I'm looking forward to the panel to talk more about that.

Dr. Russell: thank you very much. Geoff, would you share with us something about yourself and CORE technology molding Corporation, please?

Dr. Russell: So what we will do is we will continue with our first questions for the panelists, that is OK with you. Is it OK with you, Dustin and Lisa? So the first question we want you to answer for us is we want for you to share and describe one emerging piece of technology that you are engaging or your company is engaging to do the work. We will start with you, Dustin.

Dustin: OK, great. There is a lot of rapidly
changing things happening in the world of operational technology,

Cybersecurity. A couple of those things as it pertains to education is the NSA centers for academic excellence program, as we look to partner with different schools and help recruit talent, we're using that guide basically to make sure that schools are teaching students the right things. That is one thing to look at. It is not really a piece of technology, per se, but it is definitely a tool that is being used by academia that we are excited to follow.

What follows without is the ATTCK framework, which is being added to all the time and they recently released an industrial control systems-focused framework that is being used to help identify threats and help identify solutions around securing these industrial control systems and embedded systems. Those are two things that would be worth checking out if you are an educator or involved in Cybersecurity.
education that are some tools that are currently being
developed that are on the cutting-edge, and industry is
heavily responding to and using to help kind of validate and
make sure we are on the same page with academia in terms of
skills and abilities that are needed and putting those into
the workforce.

Dr. Russell: thank you, Dustin. Lisa, would you share something
with us about your emerging technology?

Lisa: Sure. From the robotics standpoint, you can imagine the
technologies are quite robust, I could take up the whole hour
talking about the technological changes. The purposes of our
audience I think it is more useful for me
to talk about the workforce side, and as everybody knows
with the technologies changing
so quickly, it’s outpacing the way the students are learning
about those technologies, and that has been a huge problem in
having the mismatch in skills in creating this large skills gap,
particularly in the world of manufacturing.
As a national Institute, we have been focused on trying to support all of the points about ecosystem, whether it be the employees, students, training programs, or the employers.

We recently released a pretty sophisticated tool called roboticscareer.org, the only free national resource that gives insight to over 11,000 training programs focused on robotic technician needs, and it evaluates those training programs. It also helps to outline the standard robotics career pathways, which I know we will talk about through the course of the next hour, which is really helpful because people getting into the workforce as robotic technicians, they don’t know which way to go. This helps them to decipher what that pathway might look like, and identifies specific competencies that are needed for those careers and ultimately makes the training easily accessible through search functionalities. I know we have got a lot of people online today who are from robotics training.
programs, so I want to reinforce that this is a free resource. If you wanted to get your training program into it, it's very simple, up in the upper right-hand corner, it will walk you through what to do. We would love to have your stuff out there getting visibility.

I think you are muted, Mary.

Dr. Russell: Thank you, Lisa. What we would like to do now is ask you to share with us what you do as it pertains to upskilling and maybe even re-skilling technicians having to engage or interface with the technologies. Lisa, will you continue?

Lisa: Sure, absolutely.

I think part of the challenge is we as a society are typically reactive whenever there is a big problem out there, and that skills gap I mentioned earlier is probably the most disruptive to the workforce, because people aren't able to keep up with those changes and not knowing...
how to get that narrowing.

And so as a country, I would recommend that we start to focus on what we should be expecting in the next 10 years and anticipate what the workforce of the future might look like, so that we can start to narrow that skills gap currently and make sure that it doesn’t widen later on. And so there needs to be greater investment in getting the training ready for the future, identifying those gaps that are currently existing, and finding ways to scale that across the country, instead of everybody investing in the same kind of workforce training, so how we might be able to leverage those dollars. Invest in the existing workforce to get them upskilled, but not just for tomorrow, but for that 10 years.

And invest in succession planning. There are statistics saying that currently there are 10,000 baby boomers who are retiring each day, and if you start to look at with the millennials tending towards less than 7% of them interested in getting into manufacturing, how can we start
to attract larger and more diverse groups of workers into these different career pathways?

Dr. Russell: OK, thank you, Lisa. Geoff, would you -- Geoff:

can you hear me?

Dr. Russell: yes, I can, thank you, Geoff. Would you share with us in emergency technology that you are using at your place of workforce, with your workforce, and also share with us about the up skilling were doing?

Geoff: Sure. We are a plastic injection molding company where we do molding for companies like BMW manufacturing.

What is new is we are doing two shot, which is the ability to inject two different materials into the same mold paste, and it is a very common practice in Europe and now in the United States. By taking on this new technology, we are able to get much more business from large automotive companies as well as doing price for Merck and Pfizer.
What we are doing to upscale our students we have employees that come through the community college and through a four-year college as well, keeping that advanced manufacturing skills like robotics—teaching them advanced manufacturing skills like robotics, hydraulics.

It is helpful for the new students that are in school and they work in the tool shop and we have an appendage of program as well. Those are the areas helping us be competitive at get ready for the next wave of those who are retiring we can bring in young students who want to be in advanced manufacturing.

Dr. Russell: thank you, Geoff. Dustin, share with us what you are doing to upskill.

Dustin: Yes, thanks. We use a variety of different things to bring people up to speed and to get them ready. One of the things that is available to everybody, and you don't need to be a part of a degree program to do it, is what is called a capture-the-flag environment. We do these
internally can we go to competitions. If you just google
"Cybersecurity capture the flag, " you can find a ton about
these, if you think of the childhood
game, it is a capture-the-flag environment where the flag is
set up somewhere on the information system, and the
flag is a digital flight that the students have to go and find
and secure. You might have students defending the flag, you
might have students trying to get the, flag, you might have
all the students trying to find the flag. But it teaches
students how to navigate through different networks, it gets
unfamiliar familiar with the different operating systems and
tools they are using in the industry. One of the things we
do to teach and upscale people right
away we get them to use Lenox. In the Cybersecurity and just
become a lot of not only target systems will be running on
Linux, but a lot of the tools will be developed in terms of
the hacker side, the hacker side in Linux as well.
And then we also take our people to the conferences.
There's a ton of local conferences around at the state level that are Cybersecurity conferences that are great place to learn about the new emerging skills, and then there are national ones, the big ones in Cybersecurity are Devcon and blackout, which happened in Las Vegas every fall. We are sending a group out there this year. It is a great place to capture the flag at Devcon and encourages students if they are passionate to learn more, because they can interact with customers. The customers using the Cybersecurity services go.

All of the major players, major companies in the industry go. It is a great place to get some business cards and network and open your exposure. Those are some ways we open our junior-level employees' eyes to the possibilities and get them familiar with the skills needed to continue.

Dr. Russell: I have a question for all three of you. I would like you to think about your up skilling process and share what is one of the biggest challenges that you have faced for you know
that the learners face as it pertains to upskilling.

Dustin, we will continue with you.

Dustin: OK, great, yeah. I think the biggest challenge for us -- we always say that Cybersecurity is one third art, that you cannot teach -- either you are an artist or you are not. It is one third experience.

And then it is one third education and certifications.

We do our best to get everybody the education and certifications they need. You can just check the box on those. Either you have certifications or you don't. We use a number of different professional certifications to vet our guys.

Experience is experience, you just go out and do it. It doesn't mean you need to be old to have experience.

You can start in high school doing capture-the-flags and different events. You can come in with 10 different events experience. That is a lot more than people coming out with four-year degrees have done. It is not necessarily 20 years,
but it is event-based experience. The art is like any
artist. You only really know whether you have the art piece
by doing it. What we look for there -- this is probably the
hardest thing for us to identify and the most meaningful thing.
Do they love it? Are they passionate about it? Do they do
it on the weekends? In the evenings?
Do your eyes light up when they talk about what they're doing
and the flag they found and how they found it? Either you have
it or you don't. You are passionate about it or you
aren't. I would encourage everybody to
look for that, to find that, in whatever industry. Maybe it is
robotics. It is something that lights a fire in your eyes.
That is -- we quantify internally. That is about one
third of it. Usually it is the largest indicator for how
successful they will be in the field.
The biggest challenge we have is to find the people that have the
artful excitement, exuberance that is going to propel them and
motivate them to be excellent.
Dr. Russell: Someone who maybe is missing that third, what is

your process for counseling them?

Do you allow them to continue, do you have a process in place

where you direct them in another direction?

Dustin: It is usually not a black-and-white binary

condition. A lot of times it is a lot of

counseling throughout. What about the last assignment

or the last event? What aspects of it did you appreciate?

Then you can coach them in, because there is thousands of

different jobs and roles in the industry. You don't want to be

the

cutting edge tester for industrial control systems

climbing through oil wells and pipelines, being on cruise

ships. It doesn't mean you might not

enjoy being a network analyst as you don't want to be outside.

You want to be inside monitoring network traffic and being aware

of the latest threats against certain network traffic. That is
a totally different skill set than the personnel in the field

We try to home them in and get them to the place they are going to be, but eventually we try to give them -- the employees as much freedom as we can to let them know that we believe in you no matter what. We want you to find that spark. What I see more often than not is people give up on that spark. That is what we don’t want to have happen.

Maybe they thing is somewhere else, but don’t just take a job for a paycheck and grind it out. Find the thing you will be excellent at pit have one life to live good be excellent at it.

We have that soft back-and-forth with the employee. It is always ended up working out one way or the other. I think a lot of it is about the journey. Encourage the journey.

Dr. Russell: thank you. Geoff, would you share what challenges you have run into?

Geoff, are you with us? Can you hear me?
So, Lisa, while we are waiting on Geoff, could you share some challenges with us?

Lisa: Absolutely. When you look at the challenges, it is important to stay on top of the challenges you are experiencing.

When you look at the world of industry and how the manufacturers are trying to upscale their employees and at the same time keeping productivity, we are finding out that U.S. education systems is insufficient for putting people into those industry 4.0 careers or moving people through the different career pathways. We are experiencing the negative perceptions of robotics and manufacturing, robotics are taking our jobs, and there is still negative perceptions of manufacturing in general. Most of our parents and grandparents grew up and a time that manufacturing was so stable in the United States.

You have to go to four-year schools, and manufacturing
didn't serve our family well.

The large manufacturers are also finding that they have got limited resources to prepare. I cannot necessarily pay for you to go to classes or take you off the line because it is going to affect my productivity. Those limited resources cause a huge challenge. The big problem with the manufacturing workforce, they are not prepared to continually reskill. They don't have the lifelong learning mindset, where with things changing so quickly, they have got to get into that mindset. We find there is very little coordination between initiatives.

For example, we have heard from community colleges. By the time I find out there is a need and I should create a course, I have got to get the funding and the approval and create the course and find a teacher and advertise it and get students commend the two years have gone by.

That whole mindset has changed from and yet they are behind the
If you're able to support the training initiatives so things can be scaled nationally, and then the mantra of the day that -- data I keep talking about is the fact that the technologies are outpacing the skills relevance leading to the skills gap. Trying to ensure that we are not only supporting new training programs or the manufacturers or the students to support them all in a fair and balanced way so the challenge can be mitigated knowing that each of the sectors.

Dr. Russell: thank you, Lisa. Geoff had to be called away for work issues, so I wanted to let the audience know that. If he can rejoin us, we will bring him back in. I would like to turn to Mike and see if there are any questions for the panelists.

Mike: Mary, thank you. We do have questions. Let me start with Lisa.
We were looking at roboticscareers.org, we put a

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link in the chat, and there is nothing that says you can list

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your program there--there is a thing that says you can list

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your program there are might have your program indoors.

01:45:27.000 --> 01:45:28.000
Having the industry looking at new program -- do you come out

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and audit a program? We are afraid of that, Lisa.

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[LAUGHTER]

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how does work? Lisa: Just listing your program

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is very easy.

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What we have in there is a very robust survey where we make sure

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that the programs listed

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are very relevant to a set of competencies in the robotic

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technician career field. If a program deems that they

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are best in breed, if you will, we have an opportunity for them

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to apply. What that means is there is a

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set of metrics that we would say do you meet the best of the best

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standards. If they do in the application,

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we invite them to do a full-on audit. It takes a number of
back-and-forths. Some of them we've been able to do within a week. Sometimes people cannot get the data because of real-life things. It is a virtual audit. One of the good things about doing these in the pandemic is we realize it is actually able to be evaluated and there is major and minor criteria. If you meet certain thresholds, you get a bad. It is an actual badge on the website, as well as something you can use in your marketing collateral, something you can use on the website. It lasts for three years. Upon each year, we ask you to let us know any data Kemeny program changes -- any data, any program changes. We would do another less robust audit. Mike: It gives an opportunity to give your program genuine visibility. You have lots of industry people behind us. Lisa: We do. It is helpful for organizations. Let's say you are at a
particular Air Force Base and you want to upscale people into different parts of your career pathways, you want to see what is available close by, but the second is it is -- is it better than the rest. Mike: Thanks for that resource. I want to turn to Dustin. If you wouldn't mind coming on for a second soon as you said "cybersecurity competitions," the chaplet up. -- cat li-- chat lit up. We have a related question. In the cyber world, how do you deal with trainees who come in under H-1B visa regulations? Is that a restriction on the cyber side for the reasons you might guess?

Dustin: Yeah, so for us, as a DO D contractor, we are limited in our ability to interact with foreign nationals, due security clearances. Most things in the DOD that touched cyber are classified.

It is a blanket -- as soon as something has a cyber element to
it, it becomes classified. The reason for that is -- I saw

a little bit of chatter in the chat as well. It is important

for people to understand why cyber is so sensitive.

Stuxnet is a great example. Stuxnet is a tool that was

deployed on the Iranian centrifuges to restore them.

Ended up setting back the Iranian nuclear program quite a

bit. It is an advanced tool. Once it was released, now it is

out. The source code could be

gathered by private companies after being shared online. As

opposed to a missile or a bomb or some other type of weapon,

when he fired once, it is used up. When you fire a cyber

weapon, it is not used up. Your enemies get the weapon and

they can use it against you. Proliferation in cyber is a very

big deal. That is why the U.S.

government takes it very seriously and buttons everything

up quite a bit. There are a lot of restrictions

and classification restrictions around anything coming out of

the DOD. On the commercial side, it is pretty different.
The community on the commercial side is much more open.

Companies still have incentive to keep things close to the chest, but from the Cybersecurity professional side, may have seen much less regulation and restriction with people concerning ITAR. I would say that would be a good place to work if you are a foreign national coming in on a visa.

And also it is an interesting kind of tension because in Cybersecurity, the more anybody can know, the safer everybody can be bit if there is zero day, it is a unique -- something is broken in a very unique way that could be taken advantage of. If Microsoft put out a patch and for some reason there was a loophole in the past that cause you to get into the operating system and the engineers didn't find it, but the bad guys did that would be considered a zero day, and you use that to take advantage and a lot of the exploits are taking advantage of zero days.

The quicker you can identify a zero day and share about it, the
better.

With the classification commit is counterintuitive to good cyber hygiene. You want everybody to know so they can fix the things best as possible so they can compromise very many machines. On the flipside if you share everything, everybody knows everything.

They can use the information to attack other people. That is the tension there.

Mike: One follow-up on that -- what about apprenticeships?

Our company is reluctant to are companies reluctant to add a penmanship's? -- are companies reluctant to add apprenticeships?

Dustin: On the DOD site, absolutely. On the commercial side, not as much. As long as your technical tops are good, they offer internships. Those are happening on the DOD site is welded typically there only for U.S. citizens.

Often times for us, for instance, we put our interns in
for clearances. Right now the Clements backlog is about 500 days from when you first put the package into when the clearance would be approved. That is a huge workforce risk.

If you are saying you don't put these people in until they graduate, now they have 500 days they have to wait if it is a security clearance-related job we try to get that around -- we try to get around that a little bit by putting them in between their junior and senior year, or in the case of a two-year school, between freshman and sophomore year, where they have a lawyer where it could percolate through the system because it is 500 days lag.

Mike: Good, thanks. Now we will put our moderator on the spot.

Ash that will be fun. Mary, going to ask you a question.

At Cook medical, big company, people who come in, what degrees do you look for? If you look to your profile of new hires, what would it look like in the biotechnology-medical area?
Dr. Russell: It would depend on the department they are applying for. There are some departments where certifications are required and somewhere they are not required. We are facing a challenge as it pertains to upscaling. It just depends. Sometimes we do. It depends on what role they are going to be playing. It depends on which department they are going to be in.

It could be no certification to multiple certification. We offer tuition assistance program. Our employees have access to $5,250 a year to upskill in any way they want. Every year that is an employee benefit that our company offers. That is just one of a couple different tuition supports that we provide for our employees. We have one program where if a manager sees that an employee needs to have some type of skilling or certification, he can make that known to the general manager and then get permission to send them to a
specific dish we have tools in place that would close the gap.

With the hiring practices committee depends on which department and what they are going to be doing.

Mike: OK, thanks. Appreciate it, putting you on the spot there.

Dr. Russell: I know it, Mike.

Mike: Lisa, if I could have you come back on, Mary mentioned they have support for people to upskill.

If you find that true on the robotics manufacturing side?

Are companies giving their existing employees enough time and resources to do upskilling?

Lisa: I would say it varies company to company.

However, I would say the vast majority do not.

We've been working with a blood of these companies where they simply don't have the budget-- a lot of these companies with a simile don't have the budget, and they don't even really know what courses they would need to get people into specialized
different areas. For example, some of the

01:56:27.000 --> 01:56:29.000
manufacturers that we talk to, they have one job description

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for hundreds or thousands of people at the robotic technician

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level. Instead of saying, Mike, you will be focused on the

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mechanic system side and here is where

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it moves into more specialized pathway. Here is the next thing

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that he needs to do.

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You basically have a set of generalists who it is so

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important for the job training but it causes things to go

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slowly, rather than if the four of us were to take jobs and we

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knew Mary might be on the programming side and I might be

01:57:09.000 --> 01:57:13.000
the person who is great with fluid power and we would be

01:57:13.000 --> 01:57:18.000
able to make sense of how we move into the specialized areas.

01:57:18.000 --> 01:57:27.000
Another big challenge that the manufacturers are seeing is

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they are reliant on the smart people in the robotic

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integrating companies and they don't have the expertise yet

01:57:37.000 --> 01:57:41.000
established inside the organization. Once the robot and

01:57:41.000 --> 01:57:45.000
the automation solution has been adopted into the organization,
that expert leaves and goes on to the next job and you look at

things like virtualization, simulation, big data, the more

senior kinds of knowledge based as well as the things that both

make the manufacturing flow more beneficial to the manufacturer,

those things die on the vine because people don't have those

responsibilities. That part of the upscaling is

just going to take time. They will have to get people to

understand any patterning and

understanding the line of business, into the more senior

roles.

Mike: Lisa, another question came up in the chat that might

be relevant to companies not having resources. Do the

companies you work with -- are they aware for the federal

support for training programs? Do they seek estate grants for

federal grants?

I might ask Mary if Cook does that as well. Do they access

those funds?
Lisa: I would say they don't ask them enough.

We as a national Institute have resources where it is member-only solicitations. We will share the things that we know from the Department of Education, Department of Labor, the government.

As soon as any of the BAAs, those kind of things we will share with people to help them move however they can to become more mature order get the financial resources. They don't leverage them nearly enough.

Mike: An opportunity to take more advantage of them.

Mary, does cook access federal training dollars? in light,

maybe not. It is a big company.

Dr. Russell: I am not aware that we do. Maybe we do, I'm not aware of that.

Mike: All right, good. IQ, Mary.

--thank you, Mary.

Dustin: Back to you. You are interviewing a person
Dustin: I think as I mentioned, the first thing I am looking for is that third piece, and the way that might come across in an interview would be a question like "can you tell me about your favorite project that you ever worked on?" And I don't really care about the project. I don't care about the outcome of the project come I don't care how successful the project was. Do their eyes light up and killed tell me--they tell me every little nitty-gritty detail? If they can, that is something that really believed and took ownership of. If they have that piece, I can get them -- I saw a question in the chat about certs. The first couple certs we would like to do is there is certified advanced practitioner, the kind
of runs you through a lot of the vocabulary you need in the industry. Another entry-level cert is Security+ and network plus. Those are very commonly accepted.

The crown jewel cert in our industry is OSCP -- I don't remember exactly what it stands for, but OSCP. We can look that up and put it in the chat, I'm sure. That is what we push most of our people to get to.

It takes about six months worth of studying. It is a grueling test. You are doing -- you are exploiting different machines on the test. I think the CERT is between the training and the materials in the exam, talking about $1000 give or take. Those are the CERTs we work them through.

Even from internship and on, I don't think it is terribly uncommon in our industry.

Going to your earlier question, we pay for grad school, undergrad, professional
certifications for all of our people. Continuing education for us is the main priority. That is pretty industrywide. If you’re looking for an industry where you can get -- if you finish the two-year degree and looking to get your bachelors or Masters degree paid for, or certifications paid for by the company, and happens regularly in our field. The certifications would be something we would look at again. One of the first questions I ask for a junior person is how familiar are you with Cybersecurity in general and the tools. An offensive Linux distribution. You don’t have to go to school to get those things. Those are free, online. You can to capture-the-flag events free. If you go to a physical one, you can find one locally, regionally. Even if you go to one or two of them, now you have an amazing story to tell an interview of, yeah, I went to this capture the flag, these are the flags we were trying to get, I had a
pivot to this firewall, doing different operational networks

like controller-area network. You don't have to know a lot

about what those protocols are, but just because you went and

did that event, you can throw those buzzwords in that I going

to catch my attention, because I'm going to say, wow, there is

not many kids coming out of a two-year or even a four-year

program that are familiar with that, for example. There is not

many programs that teach them.

If you go to these industry-sponsored events, you

will go to these events that are on the frontline of industry but

not on the frontline of academia yet. The curriculum is lagging.

Mike: Sure. Good response there. Lisa, let me turn back to you.

And a lot of us of the area of robotics and manufacturing. What

certifications should we be looking at?

By the way, Dustin, one of our chat attendees said that your

OSCP -- I've forgotten what it meant already. It is in the

chat.

Lisa comply other interested in
--Lisa, are they interested in SACA certifications? What is recognized by industry partners?

Lisa: All great questions, and I can make an argument that for every need, there is a fit and purpose.

It is completely up to the individual and the employer where people start their entryway. We tried to be agnostic -- when it first came into our -- I came from another part of Carnegie Mellon where it was the world of software. You are stable and most of the time it is a four-year degree, sometimes an advanced degree, you have your programmer. That is what we are seeing now, is it some people start off, they are really interested in robotics, grade school, high school, doing the competitions, they do an apprenticeship, they build their mastery according. And that's great.

And then you have got some people, let's say post-COVID, my job went away and I needed to quickly get in.
Those micro credentials are taking off like gangbusters, because it was something that people were able to do while they were in quarantine. And we have got a lot of people coming in at the various pathways.

When I talked about those competencies and thankfully the mindset is now let's not have everybody try to be the master of everything. Let's get them on a pathway that mechanical systems -- I got my foot in the door, I got some kind of credential, I know I have got the essential skills, and I know I've identified where I need to go.

There is no one right answer and there is no wrong answers. It may be that you are a welder on the manufacturing floor and your job is going to be automated. You are going to be the person most logical to maintain that robot and operate that robot and inspect that well stop there is a place for you and there is a pathway to getting you to where you need to go to be successful in this career.
I wish I had a silver bullet, but I would say nothing is not sensible. People can come in and any age, any experience level, have different aspirations once they get their feet wet.

Mike: Sure. Good comment. Dustin, do you pay for certifications?

Dustin: To a degree.

We don't have a structured binary -- like, if you come in with us, we give you an extra $2000 a year.

Mike: That's what I was wondering, yeah.

Dustin: It is all part of the soft package of their CV.

Sometimes we can negotiate that, sometimes we can't. A lot of times with government contracts, the direct rate is fixed by the contract. On the commercial side, the market sets the rate.

Experience and certifications sweetly play little bit more into that salary negotiation on the commercial side. Absolutely
it helps.

We don't have a fixed dish two-year degree plus this circuit goes this amount. Mike good, thanks.

With Dustin and Lisa, we have had a real insight to how companies view these credentialing certifications.

Lisa mentioned micro credentials. What about at cook.

Do you look for credentials?

MARY: it depends on the role that they are going to be accepting.

for example, we do our edification for our people who will be on because we are highly vague.

Our safety person, that person would have to have certain certifications.

But one of the challenges I see with have certain occasions is like think they are needed but because technology has advanced

so, what we do with that is it would be a challenge to keep up

with all the skills and certifications that would be
needed for all of these different rules.

But I think that upscaling, and Dustin address this little, when Dustin was speaking on the fact of people having passion for what they do.

We have to figure out how to help people learn how to be continuous learners because we need people who are creative and curious who are interested in whatever it is they want to be applying for and will not rely on Mary Russell coming and saying you need this credential certification. They want to do it themselves. that's what I'm trying to develop in people and I think Dustin hit on the head when he said we want to know that you have a passion for this art.

because if you have a passion you are going to be waiting for me you're going to come to me and say do you know that this company is working on this piece of technology. that's what I would like to see people.

It's like we are running behind trying to make sure people are
skilled. It's going to be more impactful for their lives and

just whatever they are going if

indeed they have the passion and hold the desire to want to learn

and I think that is one of the biggest challenges and that is

kind of what Lisa was saying.

How do we get these organizations to have that

passion and curiosity to look for training out there?

and how does an organization get their people to the point

where they have the passion for me to not say you need to get

certified in this.

MIKE: as we get near the end of our

question and answer time, I'm

going to try one more question on Lisa and Dustin and then I

will go back to you.

many of us online here work at community colleges. You know

that.

What is the advice you can give

us, speaking from industry experience, what is the best
thing community colleges should do?

to the focus on certifications, projects?

I know it is a broad question, but if you have a highlight for

us.

Lisa: it really is a variety of opportunities.

I would say from an educational perspective, leverage what is
currently out there for your immediate needs. See if there is

a local vocational or for-profit

program that can fill those needs and some kind of regional

coalition to make sure you are not investing your precious

dollars in something that already exists, but for the

future, don't just focus on what the needs are today. Work with

people in the community to figure out what

gaps exist and see how we might be able to build on those for

the future.

From a certification standpoint, there are a lot of

people who don't realize there may be opportunities for them to
get a credential without having to go through training.

We have been tasked by the Department of Defense to create some virtual assessment capabilities and there are many across the country. So ensure that people have on-the-job experience may be able to test out, and move them into the career pathway that is more specialized if they have already gotten those general capabilities down.

Let them find a way to test out so that we can build that more senior level of technicians, rather than making an assumption ever starts at that same base level.

MIKE: good point. we sometimes call that credit on prior learning Dustin, you're going to tell your local community college that I want every student who comes in here to have that professional security tradition.

-- certification. NO, what are you going to say?

DUSTIN: the first thing is take a look
at that nsa cie and see if that is for you.

There are a lot of Cybersecurity at all, -- there is a lot, but if you are doing Cybersecurity at all you have the NSA behind you which is the best Cybersecurity organization in the world.

I would say get involved with a hacking club. There are one million resources online that are cheap and free. Why is a hacking club important as opposed to just a classroom? For the same reasons. We're looking for students that are not just looking to checkbox -- CHECK A BOX.

Did you join a club did you spend your Wednesday evenings inviting people from industry. And that's the third thing, don't be shy about getting your local industry involved. I would love it if our local community colleges came to me and said could you come Wednesday night and speak at our club. could you set a CTF for us? they will.

look to small businesses. big ones may be harder but they have a massive amount of resources. look to the small businesses in
those industries and ask for help. A lot of the times when you call up you will be talking to a founder where the owner and they can make actionable decisions and spend money and resources. You are talking to a decision-maker from the start and they will help.

So don’t be shy about it call them up and get a group set up.

At the end of the day but all of us want to do is employers and educators is support the next generation and help them find their passion.

To prove that they are passionate about just outside of checkbox school and getting the degree, those are dime a dozen. The people who are pursuing a degree because it's what they want to do and not just looking for a paycheck, those people are going to excel and every company wants to find those people.

people in the audience are going to contact you about being on the advisory committee. I just want to let you know that.

First, I just wanted to say I would jointly capture the flag
club. That's my take away. Two minutes to wrap up.

MARY: we have about two minutes.

so I want to say Lisa, Dustin, Jeff, and Mike, thank you. We could have gone on for hours. I know there are many things that I'm going to go and do a little research on but what I want to do now is turn it over to Mary.

MIKE: -- MARY: thank you all of you. That was terrific.

Thank you for your time and for the information and timely food for thought for all of us. We are going to take a short break.

come back at 2:20 if you are on the East Coast, adjust accordingly if not.

And we will have strategies and successes, best practices for diversity and inclusion. so come back. see you soon.

MARY: welcome back, everyone. It is with great pleasure that I introduce our second panel for day one, entitled strategies and successes, breast -- best actresses for diversity, equity, and inclusion.
our next guest serves as the director of equity and inclusion
the American Association of community colleges. good evening.

Kevin: Good afternoon, everybody. Welcome, it is both an honor and a pleasure to be with you for the session.

We have assembled today an outstanding panel of community college experts to discuss this topic. I have a committee college president, a committee college vice president and a chief diversity officer.

We are going to introduce each one and then have them say a little bit about themselves. I would like to start with our committee college president Dr. Michael Torrence.

Dr. Torrence?

MICHAEL: Kevin, can you hear me? perfect.

I'm sorry.

Thank you for having me today. I'm looking forward to engaging you in this discussion along the levels of stem and all of these
other areas which we talked about.

My name is Michael Torrence and I served as president of my community college.

kevin: next up, we have a Vice President and Dean for workforce development, Tere.

TERE: thank and good afternoon. I serve as vice president for Westchester community College, part of the state University of New York system in the capacity of workforce development and community education.

kevin: next up, I have a chief diversity officer.

FLOYD: good afternoon. Good to be with you all today. I serve as our chief diversity officer, as well as our Chief of Staff for the committee college out in Phoenix, so it's great to be with you this afternoon.

kevin: thank you, everyone, and thank you for giving your introductions. I have a number of questions that I want to pose to you and I wanted to get your take as we
have been through a very rough 2020 as we look in the future of 2021. And for our fall and spring semesters. And as we go forward as it relates to your institution. Workforce development in the United States today is spread across out-of-state institutions, especially two-year institutions with funding from a range of sources. How are issues around diversity and inclusion implemented to stimulate your local economy, enhance your institutional offerings, and position your college as a leader? Dr. Torrence, I will start with you. 

first and foremost, the conversation about the work becomes not just an important talking point, but it is foundational. It is a benchmark of the access being connected to the business. The idea of how it comes across and ties together goes along dialogue. To actual action. Those actions start with us.
Diversity, equity inclusion and belongingness does not happen if you do not look to yourself. You cannot posit something without depositing something so we are creating something for some campuses, those groups on campus are connected to our industry partners and we are making certain we have these conversations from pre-k through workforce that there is connection with our value systems. When our value systems align we make a better unquote product and our output continues to be the backbone of America.

Working with businesses and industry that can support grants and other types of partnerships has been very very positive.

Kevin: thank you.

Tere, same question. how are issues around diversity, equity, and inclusion the implemented.

Kevin: thank you. Let me start by saying Westchester community College is located about 30 miles north of New York City.

In March of 2020, we were labeled as the epicenter of the
virus, certainly on the East Coast, and we have flung into action very quickly under the leadership of our President. And so it is in that context that we work every day to create that sense of belonging that Dr. Torrence was speaking about and to ensure that what is an extraordinarily rich and diverse service area for the college is really met where they are in every locale under every circumstance.

You asked about assessment, we are constantly assessing. Dr. Miles took our WCC nickname and had us thinking that welcome, continue, complete. How are we there are students at every step of the way, how can we be honest about the gaps, where are the leaks in that continuum of progress for our students? and cannot guidance as we work to support our students through what has been an unprecedented time. in regards to workforce, I will say briefly that the pandemic and social and racial unrest in this country have allowed us to really galvanize our workforce
ecosystem. When we talk about the community college and all of those stakeholders, our K-12 system, our four year partners, community-based organizations and faith-based organizations, we have really come together to be able to assess where those gaps are, recognize industry needs and then as a community college work to bridge those gaps and those need through training both in short-term workforce and the training that is happening in our certificate and workforce programs.

Kevin: thank you very much.

Floyd: similar to what my colleagues are mentioning, just the intentionality behind the work we are doing.

And what does it take? What we have all had to be creative, what does it take to make sure these measures are effective and sustainable post-pandemic? so one of the things that has been really interesting and really great is that we were founded about 42 years ago with the idea of being an accessible
college.

one of the original colleges without walls so our whole premise is around access, equity, belonging and creating a zone where we reach learners where learners are. So pivoting to making sure that we know where our resources are allocated to intentional and methodical efforts to support our learners. one thing we have been able to do quite well is make sure we are intentionally anchoring all of our transfer agreements with some of our most vulnerable student populations.

And so another idea we have been making sure we implement is putting the community back in community college. As my colleagues mentioned, making sure we reach out to business and industry and a lot of those small businesses that are right here.

As we look at our assessment data, what we are finding is our construction and health care, those industries here are almost outpacing the national averages, so as we are looking
to make sure our efforts are sustainable, it is not only grounding and anchoring our university and transfer partners with programs that are in these high demand fields, but it is also making sure that we are intentionally reaching up to small businesses and some of our larger players in the greater Phoenix community to make sure we are having industry validated credentials, industry validated programs and offerings.

My colleague said in a previous meeting skills that pay bills that has stuck with us over the previous weeks. what we're finding is education is no longer the great letter, it's jobs. Jobs are what are moving our learners from these trajectories so what we are making -- what we are doing is make sure we capitalize off of the idea of skills that pay bills. So anchoring our transfer partners making sure we are choosing partners that have sustainable programs in some of
these market annual spaces, make sure we reach out to our industry partners that are in the spaces. making sure they are layering our credentials in these descriptions so that when our learners are ready to transfer into the workforce, that they have not just entry-level jobs, but sustainable jobs that really change economic status and social mobility.

Kevin: I'm going to my next question, but we also have a question from the audience. I'm going to hold off on that because it ties into my next question.

As you look through this question, community colleges to some very significant things when it comes to workforce and innovation. however we are often not a part of the conversation. looking through your lens at your position and at your institution, what steps have been taken to broaden workforce
development and getting students to see possibility -- to see the

possibilities?

TERE: thanks, Kevin. you are going off strict. -- script.

[LAUGHTER]

I think of the 20 plus colleagues from clearly colleges

that are joining us this afternoon and all of their

various roles and everybody in between, folks on my and

workforce development. It becomes incumbent on each

and every one of us to take our role at the table within the

unity, etc.. Otherwise we won't be at the table.

and then we wonder why our students may be overlooked or

were not being thought of for a

training opportunity, etc..

it is incumbent on all of us to be in that space and do the work

that is required with our partners or other community

stakeholders.

I think that the recent pandemic and wanting to be

there for our communities has offered us opportunities for
Mulvaney -- more venues, being part of more venues for our cuties. -- our communities.

I see that when our office steps up and sees the work they want put forward.

Also, our partners in philanthropy.

We are so grateful for our foundation recently and the way we have had others step up to offer scholarships especially for those who have been left out of training or jobs in the past. Kevin:

dr. Hardin, to question. -- same question.

FLOYD: similarly, we have augmented our relationship with unity organizations.

With the NAACP, with various fraternities and sororities that have inroads into opportunities for our learners, and making sure we are augmenting and making intentional those relationships from a committee standpoint.

We have really partnered with our academic
-- partnered with our academic affairs folks

and degree programs in how do we pair some of that down,
making sure that we are engaging again with our workforce

partners. how do we create accelerated

and more intentional pathways into these spaces that can help

change the trajectory of our learners? we have really taken

an inventory of what it is we offer and how do we make sure

we can put two micro that could really help speed their

stricter speed into workforce.

To broaden the scope of workforce I think for the comes

into the college and understands it may take years to get into a

degree program. They can see that through a

scholarship from the NAACP, I have now been able to obtain

this certification that has allowed me to go into

construction.

So now I have the skills as

well as the experience and certificate that can help me
move into a managerial space.

I think we have taken very practical measures in trying to leverage our philanthropic avenues but more intentionally working with some of our civic and community based organizations to see if they can offer scholarships and sponsorship to some other demographic populations.

We have worked a lot with NAACP, with our African-American students. We just got designated as a Hispanic serving Touche and we want to make sure that we are going back to the data.

Seeing were some of our most vulnerable populations are making sure we are creating inroads and all the branches with some of those different community and civic organizations that specifically help to sponsor and move the socioeconomic status and social mobility of those populations into sustainable spaces and making sure we are partnering with our academic affairs folks to complement those efforts and really make sure we are accelerating the pathway for some of those.
Kevin: I'm going to ask the same question but add a little caveat.

As the president of an institution, when you set the priorities for your institution with regards to broadening workforce development and innovation, what steps do you and your staff take with regards to students of color and diverse student populations and making sure you are sensitive to their needs as it related to your institution?

MICHAEL: great segue, Kevin, and you must have been in my head because I was licking my chops for this question. Specifically as we speak about students of color, whether they be Hispanic or Middle Eastern, many without a desert nation of form for financial aid.

The socioeconomic status, impacted students, and I want to get a caveat, everyone has problems, everyone is going through something. therefore making sure we are representative in our hiring
and representative in not the programmatic type of events but building a culture that is committed to this ideology.

Commitment without currency is counterfeit. If we are not going to support it with some kind of resource -- without some kind of resource, let's stop talking.

we have to be better just to support students.

The framing of the conversation, first the institution had to decide that I was not crazy and I mean that with all the love that I can sing. -- I can say that.

I want to jump into the freefall that the use of technology is the great equalizer. It is not only a resource question the way of life because enhancing technology impacts everything we do. We wanted to broaden our connection not only in development and philanthropic but actually -- act limiting them to our culture.
Community colleges have long been at the little kids table and I refuse to be anyone's little brother or anyone's stepchild. I am at the mindset that at our institution, we will build our own shares and invite you to sit with us. We will happily invite you to sit with us and move the meeting but you have to acquiesce to our values to achieve persistence and connection and long-term skill development our student population. We are not going to back down from being committed to that. Remember that training is workforce, education at the end of the day is workforce and that's the script we are trying to flip here. Make it understood that in stem areas in the arts, we are not educating you to be with us for six or seven years but to get in, get out and cap that and to have the kind of impact and community develop as soon as possible because at the end of the day literally your life depends on it.
Kevin: I have a question from the audience that ties into what

I have just asked.

the question that we have is we have observed that some of our

students have fallen through the cracks in between academic
terms. how can we support students between terms to

further student success? would anyone like to take a

stab at that?

MICHAEL: I am in.

let's ask institutions, let's ask the divides that we have

created amongst ourselves.

I was a professor before I was an administrator.

At the end of the day I have been everything that the

institution supports and is. Therefore, we are part of it

all.

there is no segmentation of what we are trying to do. We are all

in the same team. We cannot help them we cannot help ourselves.

As it relates to students, our faculty are the best and I know
we would all say that.

The idea of when the contract stops and when the contract begins how do we feel that cap

-- tht gap -- that gap? So that through the noncredit micro pretension, we can pay them a market rate that will support enhancing of skills on a continuous basis.

There is no summer school, just continuous ongoing learning. I think that’s one of the best ways to support students.

TERE: it’s hard to follow on that kind of statement, but I will say that from a more practical perspective, we are focused very keenly on understanding our students and looking on a continuum of learning. There might be a break, you are our student until you reach the intent that you came here to fulfill.

that ends up evidencing itself in a case management approach to how we work with our students and we work with them very hard at Westchester College to get to a place where we can scale and
sustain case management for all of our students.

We know that when we look at the work we do in our educational programs, we are very fortunate to be far along in the Ricky -- in the replication of a model to help students move from developmental education through to completion and when it works, it works because somebody knows my name. They're watching out for me they know I haven't been class and they want to know what happened.

Those needs go, as Dr. Torres has referenced to my housing needs, my food needs, my family needs etc., so it is a challenge that we all take on asking to be college educators and administrators.

-- take on as community college educators and administrators.

FLOYD: I've learned that when a campus is connected outside of the classroom, outside of just the book they are studying from, that connection happens with the institution. I would go further to say that tension happens at the onset of your experience.
it does not have -- that retention happens at the onset of your experience. I say that with all the love in my heart is often we forget in education that we are providing a service, that we are getting folks from point A to point B so part of that is making sure that everyone on campus goes back to that culture building. that we are a social justice institution where we care about all of our learners. Every learner involved with us and those that are not yet. Retention starts from day one and part of that is building a culture where staff and leadership understands they are both a treatment and retention specialist. They have the job to check in with student and learners and bring them. It sounds counterintuitive, handholding through the process. It is hard to register for class, is hard to take care of the family and do homework and all of those things.

Dr. Torres mentioned that we are all going through something so
to move from the mindset of that is not my job to I can absolutely help you is crucial and that all comes with culture.
corporate modeling -- cohort modeling, programs, all help to facilitate connection and if I am being celebrated for getting a B in a course that is considered difficult, I'm going to keep going on all of those different theories show that when a student is celebrated for milestones, they built that connection and they seek it out.
I think that along with early alert systems and being able to log into the data to see which students are struggling and which are successful, when a student feels safe to ask for help, they will ask for help and part of that is creating a culture where we are creating safe spaces across the board and that is academic affairs, student affairs, every silo, every house on campus.
Kevin: I thank you for your answer and something you said really resonated with me. You said diversity is data and I wanted to see if I could get you to expand on that little more.

With everything that happened last year and as Dr. Torres indicated, each one of our institutions faced some type of issue centered around DEI. When your data showed that a particular group was falling through the cracks as opposed to other groups, what best practices, or what did your institution do to assist that particular so that other colleges can learn from what you did at your institution?

FLOYD: here in the Maricopa County College District, 31 or so percent of our students are Hispanic with about a quarter falling below the poverty line. So when we look at some of our most vulnerable populations, we have a number of learners that are remote on the reservation and we find they are not always
represented well in the classroom but are some of our highest performers in the classroom. But we have done is created a whole division called our national division.

For those who don't know, the colleges about a 70% online institution. In Sobol we have always served students across the nation, with the implication --

implementation of this division, we have thought to create access across the country and that means really augmenting our work with our tribal colleges and universities.

We have about seven articulation agreements across district and we talked a little bit earlier about the K-12, K 20 ecosystem. Really making sure that what we are looking at doing is being right here in Metropolitan Phoenix where we have a number of school districts and a very robust precollege program and

we are creating is pathways
where we are working with learners where we know that their special interests and cultural relevance will be protected and celebrated and uplifted again creating that campus connection.

So they come, they get their foundation and reduce soft handoffs through our articulation agreements. The school had an articulation agreement year and a half ago with Paul Quinn.

-- Paul Quinn University where a percentage of students who go into that university get tuition free so it's being able to create relationships like that to make sure we are servicing those students who have really been hit either pandemic and a lot of them are our black and brown students here. Specific. -- very specifically.

so making sure they can create that picture and then handholding through that pathway.

That is just one of the initiatives we have taken on and
intensified the pandemic. Another one we have implement

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it very seriously is our equity action forum.

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I mentioned earlier wrist lotto was founded from a space of

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accessibility for what we have done is created intentional time

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and space for our populations to really come and discuss and talk

03:02:27.000 --> 03:02:32.000
about initiatives that we can take to

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make our campus a space of belonging for populations across

03:02:34.000 --> 03:02:36.000
the board.

03:02:36.000 --> 03:02:40.000
Kevin: do you have anything to add that?

03:02:40.000 --> 03:02:42.000
TERE:

03:02:42.000 --> 03:02:43.000
I would add specifically, Kevin, we all know that real impact

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happens in the classroom and Westchester community

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College is so lucky and talented to have been awarded

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two grants over the last several years. One of them with a focus

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in photonics and optics and

03:02:56.000 --> 03:03:01.000
creating gender equity in those areas of technologies and most

03:03:01.000 --> 03:03:18.000
recently an HSI HTE grant that will focus on helping pedagogy

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to be culturally responsive for such a diverse group of
students. I am not an expert in either of those.

A lot of my colleagues are at the conference. I hope they will throw some things in the chat and make themselves available to answer more but I do know that kind of support that we get from NSF and being part of this program and the mentor connect program that really led us to this place were we can learn from other colleges doing the same work and creating a community of practice really informs how we work with and support our student on their academic journey.

So a little bit different from your question but again a record of recognition that they provide the best success.

One more thing that first grant around photonics led to some unintended great consequent point those same faculty were encouraged and energized to help us create curriculum and advanced manufacturing and noncredit credentialing and so
all of a sudden we were expanding pathways and expanding
opportunities and recognizing that a student's journey is not linear, it is cyclical.

We continue to have students beginning in and moving to credit taking advantage of short-term credentials as they explore new industries and pathways.

I have been Tennessee or the Regents system since 2013. My math is escaping me right now. I am an English major, by the way.

The idea of leading by investment leading from where you are, making sure every engagement we have with students is encouraging and authentic and also we are supportive of the faculty and staff.

Folks don't see me, I'm in passing and moving quickly to get from one place to the other knowing students by our name or how big our organization gets, knowing a better name their
dreams and helping them get there at Westchester this

03:06:16.000 --> 03:06:20.000
professor named Mark Condon an old

03:06:20.000 --> 03:06:25.000
colleague from Northeast Nice to have conversations with him

03:06:25.000 --> 03:06:27.000
about pre-k to the grave.

03:06:27.000 --> 03:06:30.000
-- I used to have conversations with him about pre-k to the

03:06:30.000 --> 03:06:32.000
great that's what we used to do I hope everyone on the

03:06:32.000 --> 03:06:38.000
screen is familiar with the

03:06:38.000 --> 03:06:43.000
opportunity to condense.org Note where students come from.

03:06:43.000 --> 03:06:46.000
It's amazing that a mile away from each other can literally be

03:06:46.000 --> 03:06:55.000
across the tracks Being next door to a neighbor

03:06:55.000 --> 03:07:00.000
is varied based on who's working how the people in the

03:07:00.000 --> 03:07:05.000
house are working what you have for dinner and even if you are

03:07:05.000 --> 03:07:12.000
having dinner Making sure we were covert

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these things that allow us to push persistence to completion

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equals success you need to make sure that our students come away

03:07:23.000 --> 03:07:25.000
with not only the skills to pay bills but an understanding of

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financial literacy.

03:07:27.000 --> 03:07:28.000
do you know what happens with compounding interest I don't
know if you know that as an adult. If you put away a
thousand dollars when you were 18, you are going to be OK if
you don't touch it. Understanding financial
literacy. In Tennessee specifically, we
have a tendency promise Tennessee reconnect and
Tennessee strong which they little-known program for our
guardsmen. This is the way we leverage the idea of technology
and skills
to improve condition -- improve the human condition.
Kevin: we are getting some great questions and I am going off
script a little bit but I'm going to ask you the last
question and I am very mindful
of the time we have some great questions
and I think it would do us justice and do our audience
justice if we talked about them because this is what our field
is working for.
I wondered if we can take a moment
the first question I want to address is, which strategies would you suggest for two year colleges to track student demographic information and better understand which students are being served? You have alluded to it before but I was wondering if you have anything specific that you can provide to answer that particular question. Thank you.

FLOYD: the first thing I would say is encourage opting in. So much of what Dr. Torrence alluded two on the other side of the tracks -- it is still scary to tell folks that you are poor, that you are gay, that you are black. We lose a lot of valuable information because we don't create spaces of belonging.

I will use this as an example, October reporting. We had so many folks on campus afraid to report that they were in close contact with Covid or that they had Covid, that they attracted Covid, but what they have come to realize is us understanding the numbers and where we are in the population,
being able to assess the data helps keep them safer. I think

there is still a stigma

-- I just typed in the chat, the digital divide is still very

real and we have students who are still typing term papers on

their phones, and that is a scary thing.

We have students who have food and security, housing and

security, housing insecurity, experiencing homelessness. That

is uncomfortable to report.

But if I know that if I go to any institution and I feel

comfortable reporting that because I know, through my

opting in to the point it’s, I would get help and the support

systems that I need to be successful, then I will gladly

report.

That is the first step, from a DI lens, is capitalizing on

that, greeting that space of belonging. We are asking you to

opt in because we have the resources that can help you and

if we don't have the resources, we have the partnerships with

the resources that can help you.
That is rudimentary ground one, being able to create that space.

Kevin: would you like to add to that?

TERE: I think in addition to all of the data that we all caps share, retention, graduation rates, GPA accumulation, our students on track -- are students on track to graduate,

We also focus on doing some of those soft surveys of our students. This morning, we got from our institutional research department some results from surveys from students who did not return to us.

Who are they? Why didn't they come back?

Can we get some of that qualitative information so that we can respond to that? Then I would say, especially over the last year and a half, we have worked hard, especially in our student access and involvement in success area,
area, worked hard with our counselors who are at the front line to tell us what they are hearing from students. For those students who don't want to opt in to the kinds of surveys Dr. Harding was talking about, can we get at what they are talking about in a different way? I'm sure I am not alone when I talk about when our mental health counselors have been working more than 24 hours as well as all of our academic counselors, our staff who deal with students on the front line. They have their fingers on the pulse of what is happening within our specific student populations and more broadly.

Kevin: Dr. Torrence, only because I know that you have done some great things in this area, I'm going to go offs gives a little more, I'm going to pose one question to you. Technology is a great equalizer.

But access to technology is not equitable.

How do the panelists, or each of you, but I'm going to directed
to you -- how do we increase access to relevant technology
tools for all students at their institutions?

MICHAEL: I love the softball. Whoever asked that question,
thank you. Access is not equity. Take that to the bank.

Access is not equity. Everybody needs a different
type a box, everybody needs a different type of door.

We are not the same shape, height, weight, eye color,
ethnicity, religious ideology, etc.

Access in terms of use of technology, I'm thinking about
paradigm shifting. Bear with me, look it up if you don't know
about it.

PPT -- GTP3, GTP4, these are they which a eyes. If you want
to help students, get engaged with the future of learning.

Talk about personal sovereignty as a way to decentralize and
create ownership for our students in their data. How
about that for a Paradigm chef? Students own their data and
they get to
Over the use of their data by alphabet, Amazon, whoever is using their data. Personal sovereignty and students own their data. I think a lot of people would leave not just without debt, but they would the fin the black from institutions of higher education. Earners versus owners.

Do your students understand the ideology behind being an earner, I work for some entity, I am an agent of some state or some entity, versus ownership? I will give the sport analogy because it is the one I can both understand because if you don’t play a sport, I would use music but we had time for sports. When my son talks about he wants to play for a team or a coach or a professional team, I ask him the question, I asked my daughter the same question, why don’t you want to own the team and watch those who play the game that you enjoy participating in it? You can play with them whenever you want if you are paying them and when you own the team, you can say, I want to get in on display. Ownership versus earning.
Can you be an owner and an earner at the same time?

Absolutely, but we need to push not just the concept of entrepreneurship at entrepreneur thinking. That is the paradigm shift technology is taking.

That connection between VR, AR, the ability to create code across all disciplines, whether you are in humanities, the stem fields, having that skill set is going to be important. I will end with three questions for the group, not our group, but the people listening. What integrative AI functions would a device utilize to serve as

For human development? Number two, is everything thing which-based? If it is -- language-based?

If it is, where does our encoding evolve?

We are a mathematical-based society, but we don't spend time explaining in what I would say -- we lack the ability to explain on a larger scale equations and we use language as
the teardrops of mathematics to converse with each other. That

03:17:00.000 --> 03:17:05.000
is my paradigm shift. Thank you.

03:17:05.000 --> 03:17:07.000
Kevin: can you repeat your three questions again for the group?

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MICHAEL: sure.

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What integrative AI functions would device is utilized to

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serve as a maximizer of human development? If everything is

03:17:24.000 --> 03:17:27.000
language-based, where does incoding evolve? And since we

03:17:27.000 --> 03:17:31.000
lack the ability to explain concepts through equations on a

03:17:31.000 --> 03:17:33.000
broader base, aren't words just the literal tears of

03:17:33.000 --> 03:17:38.000
mathematics?

03:17:38.000 --> 03:17:43.000
I know that is a lot to unpack, but you asked for it, so you got

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it.

03:17:48.000 --> 03:17:55.000
Kevin: OK. Very quickly, you mentioned

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this before, great shout out to Westchester community College

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and a great question from one of your colleagues. Westchester

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community College has a new grand, professional development

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for culture responsive technician education.

03:18:05.000 --> 03:18:12.000
Could the panelists address how faculty and others at their
institutions are being supported in learning how to implement better behaviors and strategies to foster a campus and a climate that is conducive to diversity, equity, and inclusion at all levels?

I will start with you without one. -- with that one.

FLOYD: one of the things we have done is we are starting the movement to an antiracist curriculum. What does that mean for us? What does the lift look like for faculty? How do we go about doing that?

Leaning into culturally responsive teaching and practices. One example of what we have been able to do is low hanging fruit, a couple years ago, we started with our psychology 101 course and took that course and we revamped the physicality of the course -- so two things. Number one, we did open educational resources.

We make sure that every resource is already embedded in the
There was no cost for books, there was no additional materials necessary. Across-the-board, we are looking to figure out, what does it take to make sure that we can move just about all of our courses to OER, because that eliminates a financial barrier.

Number two, the psychology course I was mentioning, we started with the psychology course and what we were able to do is, at the time, we changed our orientation -- retention starts at orientation. We changed our orientation to the course where had video introductions and a lot of our administrators, people of color, so we did a psychology course pilot for minority male students specifically and what we found is in that pilot, after we changed the images in the online resource, we kept the concepts the same, we kept the stories and scenarios and case studies the same, all we really did is change the physicality of the pictures so that representation matters.
What we found is that students of color, our minority male students in our students who were unidentified and are white students all performed better in an experimental group than they did in the control group with the inclusive images and inclusive stories.

What we have done now is we are in the process of what does that mean to create a psychology course for LGBT students, a course for women? So looking at our special, most vulnerable populations, going back to our data, who is underperforming, and what does it mean to be able to create -- keep a lot of the content the same, our learning outcomes the same, but making sure that we are presenting materials that are representative of stories and of experiences so our learners can feel connected to the class? Those are two things we are looking into.

Looking to lean into the idea of an antiracist curriculum and augment our CRP and CRT and also specifically looking into OER resources.
Kevin: in the essence of time, I want to stay on track.

One last question for our panelists before I turned back over to Marion and additional Q&A if we have time. What final words of advice would you give to those practitioners who are committed to successful DEI practices at their respective institutions related to workforce technology and economic development? Tere, I will start with you.

TERE: thank you.

For so many of our students, the community college is and has been a safe haven, and we found that even during these last 16 months, while we were not there for them physically in many ways, we have been there for them and we have an obligation to have been there for them.

I feel strongly that we can be what binds our students together during this time, what allows them to continue to be so resilient, which so many of them have been during the course of the pandemic in the last year and a half for all of
us. I don't have advice, per se.

I know that we can make change happen for our students and we can be the champions and the foundation for their success.

Let's look at everything -- let's look at our student body in our communities from that asset base that we all talk about when we talk about DEI and created that a sense of belonging that Dr. Torrence and Dr. Hardin have talked about.

Kevin: thank you.

Dr. Hardin? FLOYD: I would say lean into stories. Diversity is not a monolith. As a diversity practitioner, I try to stay away from the word diversity because it can be polarizing sometimes. I like to use the idea of accessibility.

No matter where you are politically, religiously, ethnically, we all want access to success, whatever that may look like for us.

Dr. Torrence set it eloquently, access is not necessarily actively -- not necessarily equity. But it gets us into the
room. It may not be the room that we want to stay in, but it

gets us there. The most important thing is

understanding that there is no black experience that is a

monolith, there is no LGBT experience that is a monolith,

there is no women's story that is a monolith. Every story

matters.

We are moving our institutions into social justice institutions

and walking the walk of inclusivity.

It is important that as both my colleagues said, we need to know

our students by their names, we need to know there's

two ways -- know their stories, so while they may be LGBTQ, they

are also a veteran. Does that mean for them?

When we know the stories, when we understand that there is no

one single way to experience one of these demographic

experiences, we can better allocate resources to help that

student, to help that learner in the way that makes the most

sense for them. I would say Leslie and into stories and

understand that diversity is not a monolith.
Kevin: thank you.

Dr. Torrence? Michael: I would echo everything my colleagues have said and also add that we have to beg the question, once we get through the dialogs and get to reviewing data that we can assess and enhance, we have to beg the question, how do we continue to make this better?

This is in quotation marks, because as I said, let's do some paradigm shifting. If there are federal regulations, if there are state regulations, if there are guidelines and policies that we follow that are barriers to student success, let's Champion to change them. That is not asking too much. That is a simple thing.

I want people to be successful, successful for people who look like me and don't look like me as they define it, as it should. Success should evolve depending on the opportunities for advancement for our graduates and for those who work with thousand get the skills that
they need and say, we are going to become an entrepreneur.

Our conversations are about belonging, it is not simply

about those in which we serve, which is the student population

and our communities, philanthropic organizations, it

is also about the people that you work shoulder to shoulder

with every day. It begins with each one of us, with each one of

you listening to this panel. What are you going to do today

to advance the mission of belongingness and a real sense

of self and camaraderie and collegiality in institutions and

beyond? That is an important caveat to

think through, that a lot of times we are waiting for

Superman and there is no one coming with tights and a cape to

save us from the things that we know we need to do. Let's stop

talking about it and let's do it.

Kevin: thank you.

To all of my panelists, Tere, Dr. Hardin, Dr. Torrence, I

cannot thank you enough. If you could just look in the chat, all
of the comments that we are getting, we actually did

not need questions, the audience and the participants are filling

it up because we know that this is such an important topic.

I want to thank you for taking time out of your day to share

with us the great work that you are doing at your institutions

and the sharing of your best practices. To all of the

participants, we want to thank you for joining us. We enjoyed

doing this and working with you. I would like to wish everyone a

good afternoon and I'm going to turn it back over to Mary.

I cannot say anything more than what Dr. Christian just

said. I am grateful for all of you for being here and sharing

your thoughts with us, thank you very much.

What a great day, day one, going out in fantastic style. With

that, I'm going to go ahead and handed over to our conference

chair for closing remarks.

thank you, and thank you to everyone for attending day one

of this HI-TEC conference. I echo everyone's thoughts.
Amazing panels. Thank you to our presenters and our keynote. 

We hope all of you have enjoyed our program as much as we have and we look forward to seeing you back here tomorrow at noon.

Eastern as we continue with our second keynote speaker, Jessica Gomez, and agreed panel of faculty and students entitled, I sure hope this persists,

students and educators share strategies from the past year.

Please take a moment to complete our conference survey which you will see as you exit the zoom presentation. Your input is important to us and helps us to shape future conferences.

I hope everyone has a wonderful evening and we look forward to seeing you tomorrow. Bye-bye.