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Foundational AI Research – Education and Workforce Development

Session: 3

Education and Workforce Development

Date: April 29, 2020

Run Time: 00:27:28

<https://youtu.be/67u0pwkKcfl>

Moderator: Penny Rheingans, Director of the School of Computing and Information Science, UMaine

Panelists: Jason Judd, Executive Director of Educate Maine

Sharmila Mukhopadhyay, Director of the Frontier Institute for Research in Sensor Technologies, UMaine

Walter Rawle, Chair of the IEEE Maine Section

The University of Maine Artificial Intelligence Initiative (UMaine AI) is a unique Maine-based venture that brings together university, industry, government, and community collaborators from Maine and beyond to advance the field of artificial intelligence, and through development of innovative technologies and applications find transformative solutions to enhance human life and societal well-being in Maine and beyond.

Transcript is machine generated, unedited, in English.

00:00

the next panel moderator dr penny

00:02

renigans uh director of

00:04

school of computing and information

00:06

sciences at university of maine

00:09

thank you ali uh in this next segment

00:12

we'll turn to the needs and resources

00:13

for education and workforce development

00:15

to support the growth and ai

00:17

capabilities

00:18

i'm penny rankins i'm director of the
00:20
school of computing and information
00:22
sciences here at umaine
00:23
i'm pleased to be joined by jason judd
00:26
director of educate maine
00:28
sharmila director of the humane frontier
00:32
institute for research and sensor
00:34
technology and walter rahl president of
00:36
the ieee main
00:37
section we'll each give a short
00:39
statement and then we've left plenty of
00:41
time
00:42
for answer your questions at the end so
00:44
please use the
00:45
q a box to send us your questions uh
00:48
jason will lead off with some thoughts
00:49
about k-12 education
00:53
great thanks vinnie
01:05
great hopefully everybody can see my
01:07
slides now and uh we'll go ahead and get
01:09
started i'm excited to
01:10
to be here i've already learned a lot
01:12
about uh from this conversation so far
01:14
and i was asked to talk about
01:15

uh what's happening in in k-12 education
01:18
as it relates to artificial intelligence
01:20
intelligence as as penny mentioned i'm
01:23
the executive director of educate maine
01:24
and educate name is the business led
01:26
education advocacy organization which is
01:29
focused on increasing educational
01:30
attainment
01:31
and career readiness we facilitate a
01:33
program called project login
01:36
which is really about building maine's
01:37
tech workforce working with k-12 schools
01:40
higher education institutions as well as
01:43
employers
01:45
so we like to we like to kind of work
01:46
with everybody who's supporting this
01:48
this work um you know moving forward so
01:51
what i wanted to do is give you a sense
01:53
of what's happening with artificial
01:56
intelligence right now
01:57
in maine and what the k-12 system looks
01:59
like so i
02:00
wanted to pull together this nice
02:02
graphic which really describes the
02:03

the five big ideas in k-12 education as
02:06
it relates to artificial intelligence
02:07
because i
02:08
i think you can naturally kind of think
02:09
about you know what are some of those
02:12
building blocks
02:13
in addition to sort of a strong math and
02:15
science uh foundation
02:17
and computer science foundation where
02:20
students are beginning to learn what ai
02:22
is and teachers are beginning to learn
02:23
what ai is and and learning some of
02:25
those skills and you can see
02:26
that some of these the skill and
02:28
knowledge you can you can certainly
02:30
learn in computer science classes but
02:31
you can also learn in classes like
02:33
you know social sciences and engineering
02:36
and science and math
02:37
etc uh i wanted to talk a little bit
02:40
more about computer science
02:42
education here in maine to just remind
02:45
folks of kind of what the climate looks
02:46
like
02:47

and made about 40 percent of our schools

02:49

have computer science offerings

02:52

um and certainly that's a number that

02:54

we're trying to increase collectively so

02:56

that all maine students

02:57

have computer science instruction in the

03:00

k-12 system

03:01

so that they can get excited about

03:03

potential majors that relate to this

03:04

area

03:05

in the higher ed system so there's a

03:08

number of different initiatives

03:09

happening

03:10

one is the cs4 main coalition which is a

03:12

whole group of organizations

03:14

working together on policy as well as on

03:16

teacher professional development

03:18

to get computer science into into more

03:20

schools and to help train

03:21

more teachers on how to teach computer

03:23

science

03:25

the department of education here in

03:26

maine has also worked on a computer

03:28

science

03:29

education state plan um for that really
03:32
maps out what the next couple of years
03:33
needs to look like
03:35
from maine to continue to scale up
03:36
computer science activities
03:39
and then we have a number of active
03:40
teacher professional development
03:41
programs
03:42
some through the universities some
03:44
through non-profits that are teaching
03:45
teachers that are brand new to computer
03:47
science
03:48
how to be computer science teachers and
03:50
certainly a lot of that different
03:51
curriculum
03:52
has not only building blocks uh you know
03:55
that connects to artificial intelligence
03:56
but specific lessons that that students
04:00
can do to explore
04:01
this particular topic also our code
04:04
activities
04:05
and other sort of short-term lessons are
04:08
one way for students and educators to
04:10
learn
04:11

what what artificial intelligence is all
04:13
about and how it connects to
04:16
the work they're doing in k-12 schools
04:18
broadly we have more work we need to do
04:20
in this area
04:21
to make sure that our young people have
04:23
a good understanding of ai
04:25
and computer science before they get to
04:28
the higher education system
04:30
so i also wanted to talk really briefly
04:32
about
04:33
something that's in common with both the
04:35
k-12 system and
04:37
the higher education system which is
04:39
which is a reliance on
04:40
internships and experiential learning
04:42
activities
04:43
we want to make sure that young people
04:45
can explore these skills directly with
04:47
employers in addition to in the
04:48
classroom
04:49
we run a program called the focus main
04:52
intern experience
04:53
with more than 600 interns that come to
04:55

us during the summer time
04:57
and we're the convening organization for
04:59
them and many of those students are in
05:01
computer science
05:02
related internships in maine and what we
05:05
hear from employers is
05:06
the more experienced knowledge and
05:09
interest young people have
05:10
in artificial intelligence the more
05:13
marketable they are
05:14
to getting those on competitive
05:15
internships so among our employer
05:17
community that we work closely with
05:19
there's certainly interest in
05:22
the expansion of these uh experiential
05:24
learning opportunities both as students
05:26
finish high school
05:28
um as well as uh move ahead to their
05:30
college
05:31
um experience as well so i i couldn't
05:35
uh present without really emphasizing
05:37
partnerships uh which is
05:39
you know this particular presentation
05:41
this afternoon i think is a good
05:42

illustration of kind of leveraging

05:43

a lot of different folks with different

05:45

expertise from all perspectives

05:47

and uh and uh you know making sure that

05:51

uh

05:52

um making sure that uh you know we can

05:55

really all work together on this

05:56

uh particular um topic so there's a

06:00

couple of good

06:01

uh things i wanna share which is one

06:03

simply information sharing is really

06:04

essential um

06:06

connecting formal partnerships with both

06:08

k-12 the higher ed institutions as well

06:10

as the employers

06:12

working together on teacher professional

06:14

development and using sort of joint

06:16

assets and expertise to be able to

06:19

leverage these opportunities and apply

06:21

for particular grants together

06:23

as well as really convening hopefully in

06:25

person in the future

06:27

uh that the computer science teachers

06:29

association will be coming to usm in

06:31

october

06:32

for all of all of new england so that's

06:34

a great opportunity for us to do some

06:36

work together

06:37

and do some conference sessions where

06:39

we're able to

06:40

to put a spotlight on what's happening

06:42

here in maine as well as collaborate

06:44

with our new england peers

06:47

and with that i'll turn it back to penny

06:50

thank you jason

06:53

and i'm hoping our hosts

06:57

will turn my video back on um

07:00

thank you so uh building on the

07:02

foundation of what jason's

07:04

talked about i want to move on talk a

07:06

little bit about

07:07

how we can follow up on that foundation

07:12

in higher education okay

07:22

at the undergraduate level uh

07:24

cultivation of ai skills and expertise

07:26

are really part of a broader base

07:28

uh that must include courses in program

07:31

design and development

07:32

statistical foundations electives in ai
07:36
and supporting technologies and
07:38
applications to real problems
07:40
meeting ai solutions the umaine program
07:44
uh undergraduate program sort of best
07:46
embodying that is the bachelor of
07:48
science
07:49
in computer science this abet accredited
07:52
program
07:53
provides a foundation in that program
07:55
design and development
07:57
in system fundamentals mathematical
08:00
foundations
08:01
and ethics and it culminates in a
08:03
two-semester
08:05
capstone uh that emphasizes professional
08:08
practice and and the skills that
08:10
students will need
08:11
to survive or to excel
08:14
in the workforce it also offers
08:17
electives in ai related areas
08:19
like uh art ai machine learning
08:22
computer vision cloud computing
08:25
and privacy alternatively students can
08:28

enhance a major in pretty much
08:30
anything with a minor in either computer
08:33
science
08:33
or statistics
08:37
graduate programs offer a greater
08:39
opportunity to specialize and to develop
08:41
ai skills and expertise
08:44
three main program degree programs have
08:46
substantial ai
08:47
content the first are the masters and
08:50
phd programs in computer science
08:52
which help develop the background needed
08:55
to innovate in ai technology and
08:57
applications
08:58
a cluster of masters phd and certificate
09:01
programs in the spatial informatics area
09:04
allow students from a wide range of
09:06
backgrounds to develop
09:08
the ability to apply this new technology
09:11
to uh analyze spatial data and finally
09:15
the main
09:15
uh mba offers a new concentration in
09:18
business analytics that tim just
09:19
mentioned
09:20

that trained students in the processing
09:22
and analyzing large scale business data
09:24
to extract valuable information and then
09:27
discover meaningful business
09:29
knowledge to to recommend optimal
09:32
business decisions
09:34
additionally many umaine graduate
09:36
programs
09:38
in other disciplinary areas offer
09:40
specialized courses
09:41
or course topics or project
09:43
opportunities
09:44
that apply ai tools to challenges in
09:47
that field
09:48
these disciplines range from math and
09:50
science to engineering to the social
09:53
sciences
09:56
three new programs under development
09:58
will offer even more opportunities for
10:00
students who wish to
10:02
acquire the background needed to join
10:04
the ai workforce in the future
10:06
a proposed minor in business intel
10:08
information systems
10:09

will bring business analytics to the
10:11
undergraduate level
10:13
a proposed master science the tim
10:15
mentioned in business analytics from the
10:17
main business school
10:18
will increase graduate opportunities in
10:20
this area
10:22
and finally a cluster of proposed
10:24
graduate programs in data science and
10:26
engineering
10:27
will be accessible to students from wide
10:29
variety of backgrounds
10:31
these programs build on foundations in
10:33
program development
10:34
statistics and systems and
10:38
address themes in data collection
10:40
techniques data representation and
10:42
management
10:43
data analytics including ai data
10:46
visualization and human-centered
10:48
computing
10:49
data security uh preservation and reuse
10:52
the initial application area domain
10:54
specializations will include spatial
10:56

informatics
10:57
bioinformatics and biomedicine business
11:00
information
11:01
social and behavioral data science and
11:03
engineering analytics
11:05
and with that i'll hand the floor to
11:07
sharmila who will talk about ai
11:09
workforce development
11:14
thank you penny uh let me share this
11:17
my slides hopefully you can see
11:21
my slides uh what i will talk about
11:26
are few areas on the related to
11:29
workforce development
11:31
and i'm from the frontier institute of
11:34
research in sensor technologies
11:36
so i'll talk a little bit about
11:38
understanding the broader ecosystem for
11:40
ai and stay with
11:42
one application example which is on
11:45
everybody's mind right now is pandemic
11:47
response
11:48
and make a few comments about the
11:50
educational workforce
11:52
so if we think of the broader ai
11:55

ecosystem
11:57
a lot of times what we are thinking of
12:01
is there is an application area which
12:03
could be anything
12:05
which ai is going to be applied to
12:08
and the ones i've marked in red are the
12:10
ones i see very
12:11
pertinent to humane and then you have
12:14
sensors
12:15
or other data collection kind of
12:17
agencies
12:18
which is the perception function you
12:21
collect all that
12:22
and then you have the brain component of
12:25
ai which is like maybe layers of sensory
12:27
learning and reasoning and you did hear
12:29
a lot beyond simple algorithms you have
12:31
the machine learning and the deeper
12:33
learnings
12:34
and then that creates some logistics of
12:37
how to respond
12:38
maybe through another set of hardware
12:40
components like robotics or
12:41
actuators etc or decision making
12:44

business decision making to improve the

12:46

application

12:47

so with that kind of background i

12:52

like i said i'll stay with one example

12:54

one subset of all the application areas

12:56

one subset of health care

12:58

is pandemic response so if you look at

13:01

where

13:01

ai is helping in pandemic response again

13:04

that's a huge area

13:06

helping right now and can help in future

13:08

let me just

13:09

you know stay with a few one could be

13:11

the testing one would be drug and

13:13

equipment

13:14

you know uh sort of uh development the

13:17

other is contact tracing supply chain etc

13:20

and the again few topics are marked in

13:24

red these are the areas where i myself

13:27

and some of my colleagues and frontier

13:29

institute

13:31

are involved in and just to give you an

13:34

understanding of what the workforce

13:36

needs to understand

13:37

even within a given topic the work could
13:40
be at the research level so this is like
13:42
a bench research
13:43
you know work i would do in my lab is
13:45
trying to compile or design a hardware
13:48
a component for sensing different
13:50
aspects
13:52
and then ai would sort of help us maybe
13:54
quicken this
13:55
process and then go into some clinical
13:57
level downsize what's important
14:00
and then collect the data from that and
14:02
provide the feedback loop
14:03
so this can happen in different specific
14:06
applications
14:07
so based on these applications i wanted
14:10
to spend a little time
14:12
on what would the workforce ai workforce
14:15
what
14:16
do we think would be useful to succeed
14:19
so just to give you an
14:20
example these might be two areas which
14:22
we hear a lot how ai
14:23
is currently helping and can be improved
14:26

for the pandemic response
14:27
application and the immediate need we
14:30
see
14:31
is that ai professionals need better
14:33
understanding of the application
14:35
the application professionals also need
14:37
to better understand the
14:39
ai professionals how they are thinking
14:41
or what the algorithms can do cannot do
14:43
so my suggestion is and i think a lot of
14:47
you know areas it's important that we
14:49
create application specific modules
14:51
within the education system
14:53
and those should be collaboratively
14:55
developed by faculty
14:57
from both sides and then going forward
15:01
the mantra for effective education would
15:03
be cross-disciplinary training
15:05
and there are several approaches for
15:07
that maybe ai specific courses go
15:09
mentored projects
15:11
you know student themes so this could be
15:13
this is just an example i'm throwing out
15:15
facial recognition is a known
15:17

ai component fever detector is
15:20
known sensor technology is depending on
15:23
how simple to how complex that is
15:25
you can combine to have this desire
15:27
disease surveillance kind of
15:29
you know improvements in ai or future ai
15:33
and without taking much time i wanted to
15:36
end with
15:36
one need i feel we need to instill
15:40
among ai professionals is the critical
15:43
thinking
15:43
part because they perhaps would be
15:46
better than others
15:47
to quickly evaluate the credibility of
15:49
the information that is generated by
15:52
or manipulated by machines so
15:55
that would be a very important component
15:58
of the ai workforce
16:00
so with that i would hand it over
16:03
to jason thank you good afternoon ladies
16:07
and gentlemen
16:07
thank you to the university of maine for
16:10
inviting me
16:11
to participate in this presentation
16:14

uh my name is walter raul i'm the chair
16:17
of the ieee main section
16:19
uh recently i've launched a small
16:21
startup in the space of artificial
16:23
intelligence and autonomous systems
16:25
and during the day i work at general
16:27
dynamics ordnance and tactical systems
16:29
in sacco
16:30
and it provides a very unique
16:32
opportunity for me to
16:34
see this domain from an industry
16:36
perspective in the few minutes i have i
16:39
would like to
16:39
chat a little bit about uh tangible
16:43
economic impact of artificial
16:45
intelligence and some specific
16:48
pursuits i've been involved in and then
16:50
from a
16:51
workforce pivot perspective i want to
16:53
talk about two things first
16:54
the domain of available resources for
16:58
uh an existing workforce that is
17:00
interested in uh
17:02
and pivoting and then secondly to
17:05

investigate some fundamental ideas
17:07
around what
17:08
a research and development ai workforce
17:11
needs to be equipped with
17:17
so to talk about the um economic
17:20
opportunities
17:21
uh i've recently been involved in some
17:23
solicitations
17:24
from the u.s navy uh there are two that
17:28
i wanted to highlight here the first one
17:30
is around
17:30
naval depot modernization and
17:32
sustainment
17:33
uh the u.s navy of course has got
17:36
billions of dollars
17:37
tied up in sustainment activities uh
17:40
most
17:40
importantly is logistics and maintenance
17:43
around
17:44
condition-based maintenance prognostics
17:46
and health management etc
17:48
and the slide top left sort of indicates
17:51
the
17:52
the application of artificial
17:53

intelligence to that domain
17:55
but more importantly for those who are
17:58
involved with
17:59
possibly biw or
18:02
activities associated with the marine
18:05
industry in maine
18:07
the photo on the right is a screen
18:10
capture of a trident
18:12
nuclear submarine missile and
18:15
recently the u.s navy launched a
18:16
solicitation looking for
18:18
machine learning based data analytics
18:21
for the autonomous navigation
18:23
of these to give you an idea of the
18:25
economic impact
18:26
the us navy is number one in its uh
18:29
pursuit these days
18:31
has indicated the columbia-class
18:34
submarine as the
18:35
highest priority development to replace
18:37
the ohio class submarine that serves as
18:40
the platform for the trident
18:42
the columbia-class submarine will cost
18:45
30 billion dollars per copy
18:47

and that certainly is a sizable sum by
18:49
anyone's imagination
18:51
each trident missile is worth 30 million
18:54
dollars
18:55
and of course a significant investment
18:57
in the nation's national securities
19:00
first and foremost today
19:05
so workforce education i like to
19:08
differentiate workforce education
19:10
in along two domains first of all we
19:12
have those that are interested in ai
19:14
applications and i would like to pause
19:17
the idea that there are significant
19:19
resources available
19:20
for any possibly mature or even
19:24
somebody go to school for a few years
19:26
who has been involved in some other
19:29
line of work and who wishes to pivot
19:31
into the
19:32
artificial intelligence slash machine
19:35
learning
19:36
workflow uh people like andrew eng
19:40
sebastian thrum lex friedman and others
19:43
from stanford and mit for example
19:46

and those who are involved at google
19:49
google mind google brain they've all
19:51
provided excellent resources
19:53
tensorflow pytorch deep learning
19:56
at mit.edu and intro
20:00
intro to deeplearning.com from mit are
20:02
all excellent resources
20:04
there are what we might call some
20:06
renegades at fastai
20:07
and openai that all have excellent uh
20:10
training materials available
20:12
these are all free of charge you can
20:15
actually execute code snippets
20:18
uh using google codelab
20:22
under the uh the tutorials available
20:24
from tensorflow
20:25
and um the the uh i just
20:28
would encourage everybody to think about
20:32
applying to some of these uh these
20:34
opportunities
20:36
finally in the area of workforce
20:38
education for artificial intelligence
20:41
thank you walter we're going to have to
20:44
if you want to take any questions i
20:45

think we're going to save that
20:47
sorry corrupt that's fine thank you very
20:49
much
20:51
uh if the if all of the panelists could
20:53
now turn their videos and their sounds
20:55
back on
20:57
we'll take some questions from the q a
20:59
so if you have a question be sure to
21:01
type it in
21:04
the first i'm actually going to read
21:06
briefly and then pitch to the next panel
21:09
and this is asking with in parallel to
21:11
technical advances in computer science
21:13
education
21:14
what's being done to explore some of the
21:16
ethical aspects
21:17
which is the whole next panel so stay
21:20
tuned for that
21:21
the next one i think makes sense for
21:23
sharmila and this is what ai approaches
21:25
have been used in healthcare diagnoses
21:28
there are quite a few of the the ai
21:31
community i think i could see some in
21:33
the slides
21:34

it's like a huge uh big area where for
21:37
instance you know even trying for the
21:39
drug development let's say
21:41
you you're looking at the entire data
21:43
you have available for the genomic
21:45
sequence
21:46
and then trying to piece from that what
21:48
would be the best
21:49
you know best sort of sequence for a
21:51
given for instance even within if you
21:53
look at
21:54
sars there's an entire you know data set
21:57
on the different coveted viruses and how
21:59
the sequences work out
22:01
and a big area is trying to model from
22:04
that
22:04
and ai is helping with that is trying to
22:06
model and come up with the best protein
22:08
even for developing the sensors which
22:10
should be the best antibody which can
22:12
give you the best detection without
22:14
confusion and specific kind of a system
22:16
so those are all
22:18
where our ai colleagues are helping us
22:20

and i'm sure you can come up with many

22:23

more of those i don't i can see walter's

22:25

light on side on my face

22:27

you know if you have more to add but

22:28

this is a huge area actually

22:30

and we are in the process of trying to

22:32

even see for instance even to get a

22:35

signal

22:36

you know you can get 10 different kinds

22:37

of signal how do you sort it down on

22:39

which is the best signal to use on the

22:40

field or remotely

22:41

you know monitor and things like that

22:44

thank you sharmila uh this one's for

22:46

jason

22:47

um what are the biggest challenges for

22:49

k-12 education to be able to prepare

22:51

students for ai futures

22:54

i think the biggest challenges certainly

22:56

are are there are a couple

22:58

one is as resources and making sure that

23:00

with such a large state with so many

23:02

different districts

23:03

and local control uh availability to um

23:08

to scale up teacher professional
23:10
development and develop kind of
23:11
long-term
23:12
um high quality teacher pipelines
23:16
for computer science instruction and
23:18
then certainly i think we're still
23:20
figuring out
23:21
where computer science in k-12 kind of
23:23
fits into the school day in terms of
23:25
time
23:25
and what their priority looks like and
23:28
and when it's appropriate to integrate
23:30
into other courses and when it's
23:31
appropriate for
23:32
standalone offerings but the good news
23:35
is
23:35
we're making some really good progress
23:37
working really collaboratively with
23:38
partners and i think we're going to get
23:40
there
23:40
over the next couple years thank you um
23:44
walter can you say something about what
23:46
auxiliary skill sets are required to
23:48
support
23:48

ai development so
23:52
in addition to basic machine learning
23:54
and
23:55
the core computer science stuff data is
23:58
huge for artificial intelligence
24:00
data science practitioners i think are
24:02
very important
24:04
data gathering and then associated
24:06
activities instrumentation
24:08
hardware engineers are very important in
24:11
many of these domains so
24:12
good electrical engineers are terrific
24:15
for artificial intelligence
24:18
not that there's any bias in that
24:20
opinion no not at all not at all
24:23
thank you um sharmila can you let's
24:26
let's turn it inside
24:27
out can you say something about hey how
24:29
ai might influence
24:31
the field of education oh actually
24:34
ai i think is going to change how we
24:36
teach right
24:37
it's going to change the classrooms make
24:39
them work combination of maybe virtual
24:41

and in-person classrooms
24:43
so there's a lot of augmented reality
24:46
which is already especially in areas
24:48
let's say right now
24:49
you know even to look at these medical
24:51
imaging guys you know how they're
24:53
looking at or building a 3d image of
24:55
what they got from their mri and stuff
24:56
like that
24:58
so that is at a higher level even at a
25:00
lower level maybe in k
25:02
through 12 i can see a lot of augmented
25:04
reality coming into the classrooms
25:06
so the teachers need to really be
25:09
also be retrained i think and we are
25:11
constantly learning every day
25:13
is how to say you know create firstly
25:15
the optimum mix of in-person
25:17
hands-on versus virtual reality and how
25:20
to help the students understand them
25:22
and then also the other part which is
25:24
very important for the classroom
25:26
ai in the classroom i feel is that you
25:29
know sometimes the high achieving
25:31

students can get a lot and they could be
25:33
moving in their direction and then
25:34
sometimes the students who were falling
25:36
behind
25:37
might be going in the wrong direction so
25:39
which we are learning as we are offering
25:40
classes virtually right
25:42
now is it's a slightly different
25:44
aptitude needed in the teachers a little
25:46
bit
25:47
to stay in part with different students
25:49
going different directions
25:51
and i think ai will just keep increasing
25:53
that thank you
25:54
jason can you maybe expand on that a
25:56
little bit and say something more about
25:58
what k-12 teachers can do now
26:00
to sort of support their students and
26:02
that developing the interest and
26:04
background
26:04
that those students are going to need to
26:06
to advance ai innovation
26:09
yeah i'd be happy to i mean to be honest
26:11
um sessions like this afternoon where
26:13

teachers are learning about
26:15
all this wonderful work that's happening
26:16
that's that's on the cutting edge in
26:18
terms of
26:19
um research and actually addressing you
26:21
know covid 19 and healthcare and those
26:23
types of things i think
26:25
educators simply can um
26:28
can engage in some of these conversation
26:30
educators can engage in some of these
26:32
conversations talking to experts talking
26:33
to researchers um
26:35
you know i think that's really helpful
26:36
so they can talk to their students about
26:38
these are career possibilities
26:39
the other thing that we're working on
26:41
really hard is just
26:42
bringing k-12 educators and higher ed um
26:45
institution faculty
26:47
and employers together in the same
26:48
spaces to have these conversations
26:50
to think about local partnerships where
26:52
they can work together on projects
26:56
12 that connects to what they might be
26:58

learning in an undergrad
27:00
program so a whole variety of options
27:03
but i think it just starts with
27:04
partnership and engagement and asking
27:06
questions and learning more
27:08
thank you so much um i wish we had more
27:10
time but that's all we have
27:12
uh i'm so grateful to these people for
27:15
sharing their expertise with us
27:16
i'd like to thank them for for taking
27:18
part in this panel
27:20
and i'd like to pass the floor to
27:22
charlene jane who will lead the next
27:24
panel
27:25
on issues of ethics and society

The University of Maine in Orono is the flagship campus of the University of Maine System, where efforts toward racial equity are ongoing, as is the commitment to facing a complicated and not always just institutional history. The University recognizes that it is located on Marsh Island in the homeland of the Penobscot nation, where issues of water and its territorial rights, and encroachment upon sacred sites, are ongoing. Penobscot homeland is connected to the other Wabanaki Tribal Nations — the Passamaquoddy, Maliseet, and Micmac — through kinship, alliances, and diplomacy. The university also recognizes that the Penobscot Nation and the other Wabanaki Tribal Nations are distinct, sovereign, legal and political entities with their own powers of self-governance and self-determination.