Good afternoon, everybody. We are pleased to be here today to present from the Center for Innovation in Applied Education Policy, we have

a set of speakers who have a lot to tell us as we dive deeper into our Assessment for Deeper Learning series.

Our panelists today are Dr. Alix Gallagher and Dr. Glenn Kleiman.

Both have been working for years now on questions related to policy, on deeper learning,

and what it means to have ambitious teaching as a part of the program of reform.

Today here, they're going to talk with us about emerging AI policies and practices in California schools and the nation,

what we are learning and what we need to know for deeper learning.

Our session will be moderated, as always, by Dr. Carrie Holmberg, who is the assistant director at the Center, and myself, the executive director.

And both of us are looking forward to a really lively conversation that, in a moment,

you'll realize will be structured around what we hope to be five engaging and enduring questions.

Welcome, everybody. Before we get started, we always like to just remind our audience and ourselves of what we mean by assessment for deeper learning,

and maybe more broadly, even the notion of deeper learning.

Deeper learning has something to do with the skills and knowledge that students

must possess to participate and be engaged with 21st century jobs in civic life.

This includes parts of the profile of critical thinking, problem solving, collaboration, communication,

and other skills that we can identify as a set of assets that our students can bring to the public education sphere.

But we also want to remind ourselves that we're always interested in

inviting our students into what we call higher-order thinking.

Things like evaluation, synthesis, the ability to transfer knowledge to new contexts,

and really to see knowledge as an evolving part of the practice of anyone who knows how to use their mind well.

Assessment for deeper learning

parallels and tracks this particular claim around deeper learning, and that it prioritizes our ability to assess, evaluate,

and support with feedback, students' critical thinking and problem solving, and collaboration and communication skills.

So basically, we look at this work as formative in nature with an emphasis on continuous improvement of student work.

Thank you, Brent. It's my pleasure to introduce Dr. Gallagher and Dr. Kleiman.

I'll start with Dr. Alix Gallagher.

She's the managing director and director of strategic partnerships at Policy Analysis for California Education, also known as PACE.

In research partnerships with California education partners and CORE districts,

the partners co-develop a research plan that provides ongoing feedback to support those organizations'

work and broader learning for California about how to support district and school improvement.

Alex also leads PACE's partnership with TeachAI, engaging with how artificial intelligence affects education and what state and

district policymakers could do in this emerging arena in response to COVID-19.

Alix leveraged her knowledge of instruction and teacher learning to support partners,

rethinking instructional models to include distance and blended learning.

Before joining PACE, Alix was an associate director at the Center for Education Policy at SRI International,

where she led large-scale randomized controlled trials and policy studies.

She received her PhD from the University of Wisconsin, Madison.

And now Dr. Kleiman. Dr. Kleiman has made many contributions to education, research, practice and policy.

After completing his PhD in cognitive psychology at Stanford,

he was a professor and senior researcher at the National Center for the Study of Reading at the University of Illinois.

He later returned to Palo Alto to start an early edtech company,

then spent 22 years as vice president and senior scientist at Education Development Center Incorporated EDC,

a nonprofit in the Boston area, where he led initiatives on mathematics education, educational technology, and education policy.

Glenn also taught at Harvard. He then moved south to serve as the executive director of the Friday Institute for Educational Innovation,

playing influential roles in advancing K-12 education statewide as well as in

national projects such as President Obama's Future Ready Schools initiative.

Currently, he is a senior advisor for the Stanford Accelerator for Learning and a consultant for other organizations.

We're so glad to have you this afternoon. And you see before you some heavy, thick, deep questions that we will be asking.

There are five of them. I'm not going to read each of those five right now, but these are the questions that will guide our conversation.

Brent, do you want to say something about this? Well, I have to say we couldn't be in a better situation to hit these balls or even start to pitch a few.

And so I'm very grateful, Alix and Glenn, for you all being here today with us.

And we'll sort of take these questions at the flow pace that makes sense.

So some of them we may want to circle back to after your initial responses.

And maybe we'll even want to cut back or cut out some of the direction we're going.

But we're going to go with the premise that you've seen these questions and you're ready to play.

So let's do it.

From your research so far, what is most promising about AI technologies from a policy perspective for today's educational leaders and K–12 settings?

Well, first thank you, Carrie and Brent, for including us today.

And it's always a pleasure to work with my colleague and friend Alix.

So it's great to be here. Can I make an initial comment before we turn to the question?

Please do. One is, I'd like to thank you for starting with deeper learning and with assessment.

So many of the conversations we get into about AI in education start with basically, "Oh my God, AI is here!"

"What do we do about AI?"

And I think, and I know Alix agrees, it's very important that educators start with the education challenges and as to how AI can help us meet them.

So I'm delighted to see you start with deeper learning. I'm also delighted to see you include civic life among the goals.

Too often we hear college and career readiness, and I'm the voice in the back of the room saying,"civic life, community also."

So I like the framework we're starting from. And from there...

Alix, do you want to start off perhaps some comments?

I mean, I think just I will start also by echoing, echoing your thanks and excitement about the conversation today.

Having seen the questions, I think they're very rich and they avoid the surface conversations, which are often really about how do I use AI?

What should I do with this thing? Instead of what are the big issues to solve?

And if we look specifically at these big issues

and frame them around this idea of deeper learning and trying to help people understand how students are doing on these more complex learning goals.

I think one of the things that teachers often talk about as a barrier to being able to do deeper learning is time.

And the things that really are demanding of their time that don't match necessarily their educational priorities for students.

And so when you look at what I will talk about, some of the things AI cannot do well,

but some of the things that it can do well is really speed up really routinized tasks,

to help teachers reallocate their time to things that are more substantive.

And before we started the webinar,

we were talking a bit about the National Writing Project and all the work that they have done on writing.

And I remember when I was working with them, one of the things they, teachers, talk about the challenges of assigning

writing and giving students the opportunities to do multiple drafts and how much

time teachers typically spend correcting things like grammar and mechanics,

and the extent to which that is a real barrier to teachers shifting their focus and providing students ideas to,

opportunities to hone arguments and learn how to revise.

And the good news is that generative AI has some real possibilities in addressing the routine issues and errors like grammar and mechanics,

and if used well, could allow teachers to to kind of vastly reallocate their time and rethink what it means to help

students really use writing as a tool for improving their thinking and refining it over time.

And so those types of of routine, mundane tasks that aren't quite rote but aren't really all that much above it.

I think those are some of the areas where I'm hoping AI could be most promising for helping teachers fundamentally change the way they're thinking,

the way they're teaching to better build student thinking and engagement.

That's great, Alix, I certainly agree.

And I think one of the big challenges of education is the teaching workforce and recruiting, supporting and retaining strong teachers.

And any way I can help, that would certainly be a plus for us.

I think Alix points to some of the very important ways and the issue of time in general, there are also other things I've seen...

AI tools designed to help teachers communicate with families and deal with the translation issue for non-English speaking families,

is something AI is very good at and can be a real boon.

So there are lots of things there. I'd also like to turn to the student side.

We're so much at the beginning of AI in education and we know so little and we have so little established research.

So a lot of this is more "hope for's" or hope for not's".

I think we know now one of the big crises in education is the continued steep decline in student engagement.

We see that in the absentee data, for example, we hear that in reports from teachers.

So there are many reasons for that. But there are some that are just students interested in the work, students ability to do the work.

If AI can provide supports to help students be able to do things that they find challenging, and we can keep using writing as an example

with Alix and I have worked in writing education some,

and the idea that students who are just stuck and need really support in brainstorming and coming up with ideas.

AI is a good tool for saying, you know, give me 20 possibilities about how I might write about this.

The student needs to really think and use their own knowledge and their own voice to express that knowledge, but it can help them get going.

Chris Mah who a student who we just mentioned prior to starting this session,

raised the idea once that we've long allowed and encouraged students to use a thesaurus if they're looking for the right word.

Well, AI can help you if you kind of have a sentence that's not quite right,

the AI tool can give you many variations of that sentence.

Can that help students move forward? So those are just some examples.

There's also, of course,

things like virtual reality and all kinds of online environments that are enabled by AI that might help with student engagement kinds of issues.

The list goes on and on. I'm sure we'll be discussing those as we come up in other questions, but I want to be clear

there's not, you know, a well-defined research base, most promising use of AI technologies at this point.

There's lots of ideas. There's lots of concerns about how it might be misused.

Of course, if not used well, students can use it to do their work for them, and not be engaged and not learn anything.

So we have to be careful where it could be a detriment to learning.

But I think it's important everybody know we're at this early stage and we need to try new ideas.

We need to take the risks of trying new things with students, but we need to do that cautiously, do careful evaluations.

And I think underlying that problem is the fact that the AI

technologies are advancing so quickly,

and billions and billions of dollars are being poured into products, products in general, products for education and in education.

we have to think about the education goals and standards.

We have to think about teachers being prepared. We have to think about curriculum resources.

We have to think about assessments. We have to think about meeting the basic content area standard, as well as all the sides of deeper learning.

We need to think about all the stakeholders involved, and education has to move in a much more constrained, step by step, thoughtful, careful way.

We cannot do what the technology industry does and send out what they call, was it, "minimal viable products" and what the uses test them.

We do not want to give our students things that we are minimally viable and let's see what goes wrong.

So the time scale I think is very important here also.

I'm really glad...you go ahead, Alix. I was going to jump in and kind of build on one of the things Glenn talked about around the workforce.

As this technology has expanded rapidly, there is relatively little research.

But one study that I read that was, I've thought, really promising, looked at AI as a support for tutors for students.

And, you know, as you all probably know, one of the big challenges in education is the fact that students are behind grade level,

a large portion of students and one model that many schools,

lots of schools in California, but across the nation, try to use is multi-tiered systems of support or MTSS to help address

...it's based on the assumption that the majority of students in the class are on grade level.

And then there's a set of students who need a little bit of support and a very small set of students who need a lot of support.

But in many classrooms across the country, that's actually not

realistic.

There are lots of students who are behind grade level.

And as we look at California's new framework and the fact that districts are going

to be working really hard to adopt high quality instructional materials and math,

those are going to come with assumptions that the teacher can teach two grade level expectations and also meet students where they are.

And that's not the reality in a lot of places and places, districts really struggle to think about how to support those students.

For a while post-pandemic, there has been an idea of really intensive tutoring to help students who are multiple years behind catch up.

And my read on that research is that when it is implemented well and the tutoring is good and ideally it's connected,

the tutors have an understanding both of where students are and what's going on in the classroom

tutors are able, intensive tutoring can make a huge difference for students,

But there are real problems in a lot of places coming from the workforce and

the ability to get good tutors for all students and cycling back to the study.

There was a study that looked at, done by I believem Susanna Loeb, again at the Stanford Accelerator for Learning or Learning Accelerator.

What it looked at was the use of AI to support tutors.

And it found that for tutors, tutors who are already high quality, the AI supports made relatively little difference.

But it dramatically closed the gap for students between having an excellent tutor and having a lower performing tutor.

And so I think we also need to think about ways that AI can support the teacher workforce,

maybe new teachers, maybe struggling teachers, maybe the range of

paras, you know,

teaching assistants and tutors who are also in schools trying to support students, but done thoughtfully,

I think figuring out ways that AI can support the educator workforce, constrained broadly, is also an area of great promise.

With that in mind, I'm not going to let myself jump in and I'm going to move us forward because we have several other questions.

So I am the person who has to remind us we've got few to get to. Very rich conversation.

I have a million thoughts, but I'm going to hold back. The next question...

which I think is really going to the heart of some of the work that you want to give us an historical perspective on in your recent brief.

You know that the 1953 UNESCO report emphasized a cautious yet optimistic approach to new technologies in education.

This reminds me, by the way, Larry Cuban,

our good friend at Stanford who has a lot to say about the history of tech innovation over the last 50 to 60 years in our systems.

But I think right now we're at a different moment. So let's continue on with how can education leaders today strike the right

balance between leveraging AI's potential and safeguarding against its risks,

particularly in areas like privacy, equity, accuracy and accessibility?

Not an easy question, but we can't wait to hear your response. Yeah, let me start, if I may, Alix, is that okay?

As I'm glad you pointed to Larry Cuban's excellent work over many years, and I found the UNESCO report, and I just as I was reading it,

I couldn't help laughing because I think it already... so much of it sounds like a report

that would be written right now that "we have a new era of educational opportunity,"

"something new has been added." These are quotes. "It's a social force

with enormous possibilities for good or bad."

"It's probably overrated by pioneer enthusiasts, as it is also to summarily dismissed by others."

"It should complement rather than displace the teacher. The condition for further effective advances is caution, great deliberation,

more careful and extensive testing, and above all, concern with standards."

So you could take those quotes and say, yeah, let's do those currently.

It is a matter of balance. It is a matter of exploring emerging technologies and things are changing.

It's a matter of both looking at how do we use this technologies to make current practices meeting current goals more effective?

And what does this mean as we look to the future? Because your definition of deeper learning is great and it's very broad.

But how people do critical problem-solving how people communicate, how all those things are done in an AI-enabled world will be changing.

And what that means for changing the goals, standards, pedagogy, assessments of education are very big, open questions.

So I think one recommendation is to educational leaders is take a deep breath.

Realize you're in a world of incredible change.

Think carefully. Bring together the different stakeholders, certainly teachers, parents, but also policymakers, business leaders,

to really make sure you have the support and try things,

evaluate them and realize this is not something that you're going to accomplish in the next year.

This is a journey that we're all at the beginning of. And I think answering this question, a lot of the things I would say here.

Having looked ahead at the deck are actually question five.

So the short answer for some of it, for me is to really invest heavily in educator learning.

And I know we're going to talk about that later. So I'll talk about it less

right now. I think part of that, though,

and part of what educators need to understand are some fundamental things about how AI works and what that means about what some of the risks are.

I'll give you an example from, unfortunately, Stanford.

No offense to Stanford. But Stanford IT is trying to do some really neat things to broaden accessibility with zoom.

And so in the latest zoom update that we did, one of the things that is built in

as a default is the opportunity to record and have a transcription of your meeting, which is amazing

from the perspective of accessibility in a lot of ways, and having that as a default setting,

I would argue in some situations is not appropriate because of privacy concerns.

And I think that the challenge for educators, whether they are in administrative positions and are in charge of

making policy decisions for a state,

county, district or school is to really understand the ways these technologies create,

continue some existing, issues around privacy and security and confidentiality.

But there are also ways in which they add to them that might not be expected.

So I think that's one example.

The other thing I would say, and I put a copy of th U.S. Department of Education, I think it's a report,

that came out from the Office of Civil Rights that talks specifically about some of the risks around discrimination that are posed by AI.

And I will say as somewhat someone who is relatively knowledgeable about AI,

looking through that and reading carefully, you'll see some of the examples they give.

Start out sounding really benign, and really like attempts to do good and help kids.

And so there's a real, I think, learning curve around AI, especially because of the way information is used.

And that's where some of the privacy and confidentiality issues come up.

But then also the fact that AI, because of how it was developed, has baked into it, unless it is effectively trained out of it,

some of the biases that have led some of our populations to historically and to this day be underserved.

And that means there needs to be a high level of awareness of those risks and threats.

And going back to something that that people talk about a lot,

but I think this reinforces the reasoning for it...

Humans have to be in a situation where they are making the final decision and whether they are checking the work of the AI and not trusting it.

And I read something today just about, the there was a paper that came out that talked about the use of

AI detection and how the more you try to detect AI and the more positive uses of AI you are able to detect,

those types of settings also increase your risk of false detection.

And so people have to spend a lot of time understanding how these technologies work.

What equity implications come out of them?

And really think about what it means to have this as a support.

The analogy I would use is if you're hiring someone new to a position, they're going to be your assistant.

You don't give them free reign. You check their work.

And I think there's a lot of temptation, because of how personable AI is and how confident its tone often sounds, to believe it.

And the more you know, the more you are likely to be able to prompt it well and understand when it is making things up.

It's when people get into areas that they have less knowledge, that they have less of an ability to catch errors.

And so that's a really unfortunate Catch-22. But I think a lot of thought needs to go into how we handle these, because it's not easy.

And we have to recognize that. And yet the humans are responsible for getting it right.

You know, Alix, I want to just echo what you've said.

And I think at our center, we're going to definitely platform in the not-so-distant future, test security experts,

as well as those, Glenn, who know something about how to bring detection software into tutoring and or testing environments.

I was just speaking with one of my students, who now is a principal at a high school that will be unnamed.

And I can say that one of the issues he raised for me on a conversation was he's getting false positives.

He's getting students who are being detected for cheating. And he's looked at the videos, his wife has looked at the videos.

They've done everything they can to code out the videos with human judgment.

And they're saying that, no, this is not a case of that.

Whereas other people who seem to be able to slip through the gaming of the system can still do that.

It just raises for me exactly what you said, Alix.

I think we've got multi-dimensional pieces to this puzzle, which include risks around false detection of cheating,

which then can lead to all sorts of stigma and consequences that are unfair to our students.

So just a placeholder, one of the many things that are already going on, but we're learning about, I think the next question,

is a little more optimistic: Given the potential for AI to either bridge or widen opportunity-to -earn gaps,

what specific strategies should schools be implementing or thinking about implementing based on

perhaps the research or policy insight to ensure that these tools are beneficial to all students?

And again, this goes back to this question of sort of the Digital Divide.

Once again, are we going to replicate that divide or are we going to, in fact break that barrier in a new way?

And so what are some ways that schools can get better at this equitable piece?

I wonder if I could jump in because I think I have a kind of entry answer, and Glenn's answer is going to be more expansive and a bit deeper.

So I'll just talk about my kind of nightmare scenario,

which goes back to a classroom that is a typical classroom with a wide spread of of student academic functioning needs,

and the students who are struggling most. The district, with good intention, buys a type of software to help remediate students,

and the students who can't fully access the kind of core content that the teacher is teaching,

let's say in a mathematics classroom, they are working on solving complex multiple problems that that could involve multiplication,

but they have multiple different ways to get to the solution.

And there are some students who still aren't very good at their addition.

And the teacher puts the students struggling with the prior grade levels' content on a tutor.

And that is a, you know, a tutor bot,

and then proceeds to actually interact with the rest of the classroom around the content that the entire class should be learning.

And I think there are reasons to think that--I'm a former teacher--

It's really hard to teach when you have a wide range of student needs and interests.

I think it is going to be tempting sometimes for teachers to give students who are struggling more, more time with a bot.

And I don't think that's the right thing. So that is my kind of nightmare about how this accidentally broadens the

the divide in that students who are performing better get more teacher time.

And they may also get more support to use generative AI in more creative ways

that build students' agency and understanding of AI instead of just with apps that have AI running underneath.

Yeah, that's a good example to start us off being concerned.

It's at the classroom level. And of course we need to be concerned about equity within classrooms.

I've done a lot of work at the state level on equity across schools and districts, and looking particularly at high poverty schools,

where 50% or more of the students come from are eligible for free and reduced lunch programs.

which of course goes with racial differences, goes with language differences and everything else.

So I think you framed it well as opportunity to learn.

We also need to, of course, look at achievement gaps, but there are many elements of it.

I suggest actually that we don't use the term digital divide,

because that implies the people this is about access to the technology that is one element, but only one.

As Alix points out, you can have differential uses by different students in ways that are highly biased and contribute to the gaps.

I certainly worry that in schools, in privileged communities,

they'll have good teachers interacting with the students and in

schools that are have low,

high poverty schools, they'll have much more time on the screens with AI bots.

That, I think, would be an enormous disservice to the students and to the communities.

So we do have to worry about the uses. We also know in the less privileged schools, we have much bigger problems of teacher recruitment,

teacher retention... We'll come back to professional development as Alix mentioned that we both know,

everybody knows it's highly critical. But in a school where teachers are only staying for a year or two,

it's very hard to build the local workforce to be prepared for these new kinds of ways of teaching and learning.

And so we have to look at all the elements of equity, not just think, well, we send computers home and they have access to some AI tool,

we've solved the problem. That is far from sufficient to address this problem.

Carrie, did you want to jump in for the next question or take this one further?

Well, for the next question. All right. Thanks.

With AI enabling continuous formative feedback...

--Yeah because I love this question. So easy.--Do you see traditional standardized assessments becoming obsolete?

We use some strong language there. We're going bold to see what nuances

you'll come up with from a boldly worded question. And since I'm reading along, let me read the part

the second part of this question. What role should AI play, if any,

in shaping future models of accountability-based assessments that are both rigorous and reflective of students' diverse skills and competencies?

Right. So we talked... our first question had to do with the promise

of AI.

So we're applying part of that. What could be promising or what is promising in this area of assessment specifically?

I suspect you want me to start this one, Alix? Yeah.

Oh, yes. And we may jump in more on this one.

We got a few opinions too. Please do, the thing is, I'm sure it'd be more interesting if Alix and I had some real strong disagreements,

but we don't, so it doesn't matter which one of us starts. At least we haven't discovered them yet, as far as I know.

So an important question again. There was so many layers of this.

So will traditional standardized assessments become obsolete?

There's certainly lots of work on all of this at ETS and other places involved in testing, WestEd, a number of organizations.

And there's a simple step. We can make traditional type of assessments a little more effective.

We can do adaptive assessments where the assessment changes according to the student's early answers.

enable to better pin down what the student knows and doesn't know.

And that's certainly doable. It's doable with prior technologies also.

Then there's all the big questions when we look at deeper learning and what it means to assess

you know, problem solving and creativity and communications and all the other pieces you have there.

And that's really interesting for AI because our prior technologies were very good at handling structured information.

AI can take this mass of free-flowing text and drawings and videos and analyze it and kind of pull

themes or use... it can actually be given a rubric and assess things as one might assess writing essays.

So I think there are enormous possibilities here. And the goal there is to have valid and reliable assessments of deeper learning capabilities.

to do that in a way that's not biased, and to do that in a way where the assessments are embedded in student work.

So we don't have this, "Hey kids, today's test day!" you know,

put away everything and let's have this artificial time situation, um, where whether we're testing, whether,

you know, this things whether we broke it into these little macro micro elements that we're testing,

rather than whether you get the big ideas and the central ideas of it.

and whether we're testing whether you're feeling good that day or whether you don't work

as quickly as your neighbor or whether you know you're not a native speaker of English,

and it takes you more time.

Um, there's all kinds of things integrated in there that if we do ongoing assessment embedded in teaching and learning, we have a much better chance.

And it clearly real possibilities of AI and that.

But again, it's an area where research, trial, and discovery is just beginning.

Yeah. agree with what Glenn said. I think in terms of this question,

I personally hope that we hold off on accountability or anything that has real consequences for kids' lives, based on AI for a while,

because right now we know that the analyzes that come out of AI have have real problems and biases built in them,

and biases are worse than problems because then they have a slant to them,

and it is typically a slant that hurts students who are already underrepresented or people more broadly.

But when I look at kind of the more hopeful side of this, formative assessment is one of those practices that has incredible research backing.

Everyone knows formative assessment is important,

and that teachers should be assessing students in an ongoing basis and understanding what students are learning,

how they're progressing, what they are understanding, what their misconceptions are.

Everyone understands the fundamental importance of that type of analytic task on the part of teachers for excellent teaching,

and very few teachers are able to find the time to assess in the ways that we would all want them to.

And going back again to to where I started all of this,

the idea that I could help cut teachers' time and allow them to spend more time on formative assessment,

the possibilities of AI being able to put together summaries of where your class is on something so you could do a better job planning for tomorrow.

Not that you would necessarily assign consequences, good or bad, to any student on the basis of that AI analysis without,

as a teacher yourself verifying it, but the ability to get a snapshot, even from exit tickets.

Could you feed your exit tickets to an AI? You know, just as the technology gets better,

you should be able to just take pictures of what your students do and and prompt the AI to help you understand it, to help you think

about in advance how you might want to tweak what you were doing the next day based on your understanding of where the class as a whole was,

and maybe what the variation looked like and what particular

parts of of broader concepts your students were still working to understand.

Those opportunities, I think, are great.

I really do worry about the potential consequences unless humans are really in the process of engaging, you know, the grading should not,

in my opinion, be delegated to AI, but I could help do some analysis that teachers could examine as part of that process.

Yes, Carrie. Well, thank you, Alix. Like what you are saying gets me thinking about, how much will AI shape what it means to become a teacher?

Because I'm thinking about how teachers learn through hard experience,

analyzing student work, their pedagogical content knowledge, or PCK, and if they offload

that, some of those experiences or I don't know what percentage would have to be offloaded for them to miss the opportunity to really...

Right? See, they've got to see enough and analyze and struggle with enough student work themselves to have that knowledge.

I think, but of course, I'm of, you know, now, this generation that became a teacher long before AI was in existence and maybe

beginning teachers won't feel that way and won't miss the kind of development that I got through hand sorting the exit tickets myself, right?

I mean, I take from what you're saying this idea of, like,

how do teachers construct their own understandings of student learning trajectories in ways that are deeply embedded?

And I will say a district I'm doing some research in, they did a new formative assessment.

They were actually looking at student phonics, "Develop a Phonemic Awareness" in phonics.

And it was not at all higher order. It was: Can kids decode?

And one of the things that the district decided was critical was to have students do the assessments themselves of this,

do teach, sorry, teachers do the assessments themselves.

They did not let them delegate it to any of the paras or any outside person.

They created time and teacher schedules for the exact purpose you're naming, Carrie.

So I think that's something to really grapple with is what does it look like to help teachers?

How do they construct that rich understanding of multiple trajectories and the range of students?

And yes, at the heart of it is understanding what common misconceptions are, who's having them, who's having some tweak on them.

Yeah. And what are your moves? Right. And will that be one of the shifts?

Is it going to happen and will it be a key shift? We talked we talked about the UNESCO report from 1953.

Well, we didn't say out loud in this conversation was that the technology that that was referring to or if we did I missed it, was television.

Which, who watches television anymore?

Nobody watches television anymore. And also Carrie, how successful we were in employing the educational possibilities of television, I would think.

Right, right. We did not do a great job historically on that.

I still remember being a high school teacher of history

when I was in Eastern Europe and putting on the television so we could watch the establishment of the Hungarian Republic live.

I'm not sure that made a difference in the modern history course that I was teaching, but it certainly gave me some time to grade some papers.

Less cynically, I think the really interesting point about the work of AI for the work that we tried to

do in aligning high-quality assessments with what we called learning progressions back,

and I guess it was 2005, '06, '07 when I was a grad student at Cal and worked with folks at Stanford,

like Rich Shavelson on this work with Mark Wilson.

We were playing with the idea that learning progressions were going to be the next best thing for essentially not just figuring out, Glenn,

where a student was on a computerized adaptive test by order of difficulty for the item,

but really, more importantly, having a strong, robust theory of cognition and the way in which kids learn the content so that we

would be marking those tasks around that learning progression in those turns.

And I thought, wow, AI, we can now stop funding for $3 million, two learning progressions.

We could spend much more time using AI to scour where those learning progressions are in art, P.E....

Does anyone remember there are other courses at high school than just math and English

language arts? Foreign language, world language.

You could take any number of domains in which there is a developing expertise for young people.

And ask yourself, what are those benchmark progressions?

How might we map them with our formative assessments?

And you hear me talking very like pie in the sky now and realizing nobody's really, I think, saying much about that anymore with AI,

or am I wrong, or has some have some things been lost in the discussion of instruction and even assessment around AI?

Things like learning progressions? What's your sense of that? Alix, I know you've been around long enough to remember those conversations.

Glenn, you look like you're going to say something. So I always can say something to that.

Yes, Brent, that's a great example.

And also Jere Confrey worked on the math learning progressions, and she was in the institute I was the executive director of.

And I think you're raising a great example.

I mean, if AI can figure out the structure of proteins, which it did, you know,

better than people could do in labs and did it incredibly quickly and at low cost and it figure out learning progressions...

I actually, it's a great idea. I don't know anybody who's doing that.

Maybe there are some people. If not, that's your next grant proposal.

Give us give us a call. We're ready to play.

I mean, it is just one of these ideas of putting AI to harder work than maybe we've even thought about, right?

Alix, did you want to say something on that note?

Yeah, I this is something that I don't know how to solve, but I'll raise just as a problem.

You know, we're having a conversation about learning progressions that,

at the end of the day, is deeply rooted in all of our rich understanding as educators,

of how we think about creating an environment that is conducive for whole child learning,

that is good relationally, emotionally, mentally, and also cognitively.

And it's a really rich, complex understanding of teaching and learning that's that's embedded in this conversation.

And it is not realistic to think that most of the people developing these products will come with that.

And so that's one of the things that I wonder about a lot,

as people are rushing to get products to market and to inject AI into products is what the mechanisms are, if there are any,

but getting these types of pairing developers with people who have a really rich understanding of classroom environments,

and the types of learning that we want students doing.

I worry that too many things will be focused too much more on relatively simple, didactic understandings of learning.

I want people who are developing these tools to somehow embed in their really good understandings of productive struggle.

I know, you know, there's one very famous tool that is really trying to think about,

you know, how do we get kind of a Socratic dialogue going on. So some people are thinking about it,

but it still may not be as rich as the conceptions we would want to build really resilient problem solvers and thinkers.

And so that's just something your thoughts about learning progressions really make me understand.

You know, just come back to is learning is not linear, even in subjects like mathematics where people tend to think it is.

And how do we make sure that tools are developed that reflect the richer understandings of what a good learning environment would be?

Mhm. Yeah, that's great. And there is work in the Stanford Accelerator for Learning.

I mean one of the goals is to bridge the learning sciences with the technologies.

And there are many other places doing it. It's not unique to here.

But the idea of, you know, learning progressions are a great example.

But there's so much else that's been learned about teaching and learning that is not necessarily going to be incorporated.

I do want to raise one thing because there was one slight error in your introduction,

Carrie, and then, Alix, you weren't sure if it was the Stanford Learning Accelerator.

Accelerator for Learning. It is the Accelerator for Learning.

Stanford has the famous linear accelerator in physics, I think-- SLAC!-- Carrie made it the the Stanford Linear Accelerator for Learning.

I think we have to think about it as the exponential accelerator for learning the way things are moving.

But that's where we're trying to bring together these different pieces of the puzzle.

Really, we work closely with the Stanford Human-centered AI Institute and trying to bridge what we know on

the education on the neurosciences side with all the incredible work they're doing around advancing AI.

You know, when we finished our second book on feedback for continuous improvement in the classroom last year

I had this terrible feeling that we had summed up a previous century and that we had acknowledged what teachers,

perhaps even around our table here, had done and lived and experienced in the 90s in the 2000s around

what a deep framework for feedback would look like.

Clearly, the question that is open and so deeply open it excites us a lot:

Continuous formative feedback on student work that is engaging

work, that is ambitious work, that is recursive work,

thank you, Alix, that is something about where you are in relationship to a draft, or the draft is in relationship to you,

and the mediation of a machine and an adult, let's say, all these four different frames of who's doing what.

But the most important part is time,

perhaps some opportunities to probe and go deeper, to really get into the work and what the feedback means and how it can be taken up and used.

If the machines could help us do that. I just think that it's an absolute goldmine for us all.

But the question remains how much of that will be related to what we thought was the evidence for formative feedback makes a difference.

Things like self-assessment, peer assessment, teacher-driven assessment, things like the modalities of assessment,

whether we think about feedback as delivered verbally or visually or through some other queuing mechanism.

It's such an interesting time for feedback research.

So, Glenn, I'm very glad to hear that the folks over at the acronym that shall be renamed again and again,

are thinking about feedback, hopefully from these multi-dimensional, multifaceted perspectives.

And again, at the center of it, really, you would hope, is a dialogue between the student at the work itself that is somehow being supported, mediated.

Brent, I really, sorry. Go, Glen. Okay. Just quickly, I'm glad you raised that, Brent, because, our examples were largely formative feedback going to the teacher and so forth.

Going directly to the student is so important.

But students understanding how to use that feedback, how to combine it with teacher and peer feedback, and really I think under deeper learning,

we need to put so much more effort than we do into helping students become self-directed, ongoing learners.

And AI can play a role there, but it can play either a constructive or destructive role, depending on how we prepare the students and how it's used.

Yeah. And I just wanted to to mention there's a, a study that a

Stanford professor named Chris Piech did on a coding class where he randomized students to different conditions,

one of whom had an AI bot to answer their questions and give them feedback.

And initially, it looked like the students who had the bot did better on some of their tasks,

but ultimately across a range of outcomes, their performance was not as good.

And, you know, that that particular study was done in not a typical K-12 setting,

so I think there are reasons to...where I would leave that with us is, I think what both of you were talking about,

which is the importance to really think about its uses and how as we think about how to use AI in education,

we really think about the affective dimensions and the emotional,

the ways we are engaging students as humans in a task and building

their interest and building their persistence

so that those bots or, the AI, becomes supportive of their long-term goals and really further their engagement

as opposed to a crutch that leaves them unable to to perform without it.

Yeah, absolutely. Well said. And I think we also have to get away from this human versus bot.

It's really going to be when those two are used in a thoughtful way.

In combination, the AI brings its strength.

The human brings all the things you've mentioned that human teachers are absolutely essential for, but they're working together

will be where we'll see the success. Before we move on to the next question, I just I have to say that, um, as we pitched the book to,

Harvard Education Press for our next book on AI and deeper learning, Carrie and I

remember our conversations around, well, traditionally,

the way I approached writing the introduction to anything was to talk about learning theory.

So it always made sense to say, well: here is the behaviorist approach.

Here is the constructivist approach. Here is the information processing approach.

Here is the cognitive revolution. In other words, to lay out the large frames.

And Gardner had sort of talked about this a long time ago.

You know, we can look at the way in which we now think learners learn has changed over time, and they're still contested.

Schools and communities trying to build research for a while their view is perhaps the one we should pay attention to.

I think that this whole thing, without a dichotomy of machine versus human is also theory is going to be transformed.

We are going to find out what learning means in ways that we never

imagined it.

I think in part because it's a lot more ubiquitous than the TV.

In some ways, it's baked into so much of how we interact

that goes into a 24/7 cycle.

The TV only had so many hours of our attention in a given day, and even with the channels we think about back in the day when that report was written.

So the 24/7 hour-ish-ness of it says that cognition is being transformed and AI is a part of that process.

And the question is, what is learning in the way that we might be able to answer that 30 years ago with some confidence?

So I'm just putting a placeholder out for those who would like to think hard about the next big thought.

We have a challenge about whether our learning theories that we teach currently to teachers and or tell

ourselves are relevant to building learning progressions are actually the right learning theories anymore.

The machines are changing not only how we think, but how we think about thinking.

And I think that's important to recognize and humble ourselves to. So I don't know.

That's just my big hopeful thought. Somebody tackle that somewhere.

It's an important question for us all. Carrie, you want to take us out of here?

Yeah. I'll take us out. Our final question.

Your recent article also highlights the importance of professional learning for educators to use AI effectively.

What do we know about the key components of an effective professional development program

to prepare teachers to integrate AI into ambitious teaching and authentic, deeper learning,

which LPI and others have written about as goals of 21st century

education?

Well, I'm happy to kick this one off because it is near and dear to my heart.

As you know, I think the most important thing to understand is that it is now

it is about two years since people started, regular people, started playing around with ChatGPT.

It's only been two years and the technology has evolved at an incredible pace.

There is now believable talk about getting to a more general artificial intelligence relatively soon,

and the breakthrough cycles have just been leaps and bounds forward at a pace that is hard for even people like ourselves,

who have much more time to devote to tracking this than your average teacher,

who is either teaching multiple subjects every day or teaching 100 plus maybe 200 students in a week.

And so I think the biggest thing to think about is that educators need time and there needs to be some coordination,

because the situation we have right now, and this isn't just true for helping educators understand AI,

but educators' days and we've known this for forever, are not constructed to support educator learning.

They're not. Educators spend way too much time with students

in the way our schools are set up in this country. And way too little time learning.

And we really have to think about that as one core of the learning problem.

By the time any training was developed and rolled out, the technology will have advanced beyond where it was when that development process started.

There will be new risks. There will be new opportunities.

So we really have to think about what a system looks like to help

people learn in a coordinated way.

And I think part of that needs to be collaboration and really leveraging the fact that some people are personally super interested in this stuff.

We have early adopters for everything. AI is not unique in that there are people experimenting with everything.

Some of that experimentation is great. Others won't go as well.

That's natural. But thinking about how to create environments where individuals' learning can be brought together

so that individuals can learn from each other and people don't need to reinvent the wheel.

People can share...

...that coordination is the only way I can imagine that we can tackle the speed of innovation and the level of opportunity and risk in this field.

That said, I think I said that a couple years ago. I don't see terribly many places moving on it.

There are a few districts that have, but there are a lot of challenges.

And I know we're in California, so relevant to know, many districts have a fiscal cliff.

There's declining enrollment. Schools are being shut. Teachers have been, and will be, pink slipped.

They're going to be some real challenges in the teacher workforce.

There are lots of issues in terms of how students are showing up for school mentally and emotionally

and academically——how far behind some kids are. And AI seems in a lot of places like an extra, it's an additional thing.

And that poses a real challenge for helping carve out the teacher time and collaboration necessary to tackle that.

So I think it is critical. I also think it is very, very hard for places to do right now, and that's why I personally really advocate roles.

You know, the county offices potentially playing a role in helping bring people together.

It would be lovely if the state, some aspect of our state governance, could do the same to help really connect people, to learn together.

But I haven't seen that happen yet. And given our current fiscal situation, I'm doubtful that many places will do it.

And I'm worried there are going to be some real costs and accidents and definitely

underutilization of a potentially beneficial emerging technology that happen as a result.

Yeah, that is such a beautiful, beautiful summary of what's ahead and where the policy gaps still are.

But it's hopeful because you can articulate them and you're in such a great place at PACE to do that.

Glenn, why don't you take us out with a couple of thoughts as we begin to wrap up the webinar today?

It's just been too much fun. Well, it's been great fun.

I just agree with what Alix said and with what you all said.

but I think it's good that we ended on professional development because we do not solve any of

the challenges of education unless we have talented people coming into the teaching profession,

staying in the teaching profession. And we take seriously,

as they do in other countries that are more successful when we are, their ongoing professional learning and we know how to do that.

But as Alix says, it takes time. It takes support, it needs opportunities for teachers to be learners themselves

with these new tools, it takes opportunities for them to collaborate.

It takes coaching, availability. All those things take time, money.

But I hope our policymakers see that as an investment, not some extra thing that maybe we'll do if we have some extra money, but we probably won't.

I think it's a critical investment in the future of education in this state and in the country.

I'm going to throw out a hope, which is that I think if we had a UC—Stanford,—CSU lead collaborative

that are doing the teacher training, teacher professional development that are connected in the systems of support,

and got us to be able to get together in some way, shape or form to work on these puzzles, challenges and opportunities together, Alix,

that would be a big moving of the dial in terms of even how our higher education institutions,

which do a lot of support and training, articulate across a system,

"Here's how we can do this work at a network level." So that's a hope.

That's a dream. But in the meantime, I've got to say, Carrie, we're so grateful, are we not to our friends?

We are indeed. Grateful and fortunate to have the two of you this afternoon.

Thank you. Yeah, it's been a lot of fun. Love talking with you.

And you should know all this will be on our website, including, the video with transcript and also the resources you've mentioned.

So we'll get those there for anyone who's listening and wants to learn more.

We thank you so much for attending.

And again, thanks to you for a wonderful, wonderful beginning conversation between the folks at PACE, Stanford and SJSU's

Center for Innovation in Applied Education Policy. Thank you very much.

Thank you.